

5. Environmental Consequences

5.1 Introduction

The purpose of this chapter is to identify, describe, and compare potential environmental effects that could result from implementing the six management alternatives proposed in the Revised Comprehensive Conservation Plan (Plan, Revised Plan) for Arctic National Wildlife Refuge (Arctic Refuge, Refuge). The analysis was conducted for the Environmental Impact Statement (EIS) and to comply with the National Environmental Policy Act (NEPA). Effects on the physical and/biological (biophysical) and socioeconomic (human) environments of the Refuge were considered. Existing conditions of the physical, biological, and socioeconomic environment are described in Chapter 4, and care was taken to ensure that the elements of the major issues—wilderness, wild and scenic rivers, and the Kongakut River, as identified in Chapter 3—were addressed in the analysis contained in this chapter. Current management (Alternative A) provides the basis for comparing the possible environmental effects of Alternatives B through F (Table 5-1).

5.1.1 Definitions

Possible effects of each alternative on the biophysical and human environments of the Refuge were compared using a set of general terms to describe the intensity, duration, scale, and nature of potential impacts. In this EIS, these terms are defined as follows:

5.1.1.1 Intensity of the Impact

- No effect – Impacts resulting from the specified management action that would not affect resources on Refuge lands or public use opportunities.
- Negligible – Impacts resulting from the specified management action that would have no measurable effect on resources on Refuge lands or public use opportunities.
- Minor – Impacts resulting from the specified management action that can be reasonably expected to have detectable though limited effect on resources on Refuge lands or public use opportunities.
- Moderate – Impacts resulting from the specified management action that can be reasonably expected to have detectable and apparent effect on resources on Refuge lands or public use opportunities.
- Major – Impacts resulting from the specified management action that can be reasonably expected to have readily apparent and substantial effect on resources on Refuge lands or public use opportunities.

5.1.1.2 Duration of the Impact

- Short-term – Effects on resources on Refuge lands or public use opportunities that only occur during implementation of a management action.
- Medium-term – Effects on resources on Refuge lands or public use opportunities that occur during implementation of the management action and that are expected to persist

for some time into the future though not throughout the life of this Plan (not longer than 15 years).

- Long-term – Effects on resources on Refuge lands or public use opportunities that occur during implementation of the management action that are expected to persist throughout the life of this Plan and, most likely, longer (longer than 15 years).

5.1.1.3 Scale of the Impact

- Site-specific – Positive or negative impacts occurring at a specific site that is relatively small in size (e.g., a trailhead or nest site).
- Local – Positive or negative impacts occurring throughout a specific area that is large in size (e.g., along an entire trail or throughout an entire home range.).
- Wilderness Study Area (WSA) – Positive or negative impacts occurring throughout one or more WSAs.
- Refuge-wide – Positive or negative impacts occurring throughout the Refuge but generally not affecting resources or public use opportunities outside the Refuge.
- Regional – Positive or negative impacts occurring throughout or nearly throughout an area, including and much larger than the Refuge. For Arctic Refuge, this would include the Alaskan North Slope, the Brooks Range, and eastern interior Alaska.

5.1.1.4 Nature of the Impact

- Direct – Impacts resulting from the management action and occurring at the same time and place as the action.
- Indirect – Impacts resulting from the management action that are later in time and/or farther removed in distance but are still reasonably foreseeable.
- Positive – Impacts resulting from management actions that maintain or enhance the quality and/or quantity of resources on Refuge lands or public use opportunities.
- Negative – Impacts resulting from management actions that degrade the quality and/or quantity of resources on Refuge lands or public use opportunities.

5.1.2 Cumulative Effects

At the end of each alternative, we disclose the anticipated cumulative effects of the alternative on the biophysical and human environments and to reasonably foreseeable actions. Cumulative effects include the incremental effects of the actions for an alternative when these are added to past, present, and reasonably foreseeable future actions. Cumulative effects can be the result of individually minor impacts, which can be major when added over time. Council on Environmental Quality NEPA implementing regulations require mitigation measures when the environmental analysis process detects possible major impacts on habitat, wildlife, or the human environment.

The anticipated positive or negative effects of the reasonably foreseeable activities are discussed first, followed by a discussion of anticipated cumulative effects of each alternative. Existing conditions, ongoing management practices, and past events and/or activities are

discussed in the Chapter 4 as well as this chapter. The cumulative effects discussion focuses on the three major issues: wilderness, wild and scenic rivers, and the Kongakut River.

5.1.3 *Impact Topics*

As described in Chapter 3, multiple elements combine to create each alternative: goals and objectives (except for Alternative A), management policies and guidelines, management categories, and issues. In this chapter, we will describe the effects of each element of each alternative on the biophysical and human environments.

All resources, species, and public use opportunities on the Refuge are important, but many are not expected to undergo change (positive or negative) as a result of implementing any of the alternatives. For this reason, not all species, resources, or public uses in or related to Arctic Refuge are discussed in this chapter. Site-specific environmental effects of activities that would require NEPA documentation will be addressed in subsequent environmental assessment (EA) documents or EISs.

For each major planning issue (Table 5-1), we analyzed the possible effects of the proposed management alternatives on the physical and biological environments of the Refuge for the following broad categories of resources, which are discussed in detail in Chapter 4:

- Permafrost and soils
- Glaciers
- Air quality
- Water quality and aquatic habitats
- Vegetation and terrestrial habitats
- Fish populations and natural diversity
- Bird populations and natural diversity
- Mammal populations and natural diversity

For each major planning issue, we analyzed the possible effects on the human environment of the Refuge for the following categories:

- Local economy and commercial uses
- Cultural resources
- Subsistence
- Visitor services and recreation opportunities
- Wilderness values
- Special designations – these include the Firth-Mancha and Shublik Springs Research Natural Areas (RNAs), the Neruokpuk Lakes Public Use Natural Area (PUNA), the MPA, and the Refuge’s three existing wild rivers
- Public health and safety
- Refuge operations

5.2 Effects Common to Alternatives

5.2.1 *Management Policies and Guidelines*

For Alternative A, the Management Policies and Guidelines (guidelines) included in the 1988 Plan would continue to be used. Continuing management under the 1988 Guidelines would not change the current situation; thus, Alternative A would have no effect on the biophysical or human environment. However, all five of the action alternatives (B–F) would adopt new Arctic Refuge management policies and guidelines. This section evaluates the effects of the new guidelines and policies on resource categories. Implementation of these guidelines would have the following effects.

5.2.1.1 *Impacts of the New Guidelines on the Biophysical Environment*

Those changes in the guidelines that have effects on the Biophysical Environment include:

- 1) an increased emphasis on studies of climate change effects on wildlife and ecosystems, including modeling of future scenarios (Section 2.4.10.1);
- 2) a focus on perpetuating the distinctive qualities of the Refuge's resources in their natural condition and retaining their wild character, (Section 2.4.11.1); and
- 3) a focus on maintaining the natural diversity of native species and maintaining functioning ecosystems without human interference.

Habitat manipulation or intensive management may be authorized by the Refuge manager in cases of management emergencies (see Section 2.4.2).

Permafrost and Soils

Implementing the guidelines would have no effect on permafrost and soils, but would result in increased knowledge of climate change effects and enhanced modeling of future conditions. This would have moderate to major, long-term, regional, and positive effects on the ability to understand, predict, and manage for environmental responses to arctic climate change.

Air Quality

Implementing the guidelines would have no effect on air quality.

Water Quality and Aquatic Habitats

The guidelines' focus on perpetuating natural conditions, wild character, biological diversity, and ecosystem function would have minor, long-term, Refuge-wide, and positive effects on water quality and aquatic habitats.

Vegetation and Terrestrial Habitats

A management focus on perpetuating native species in their natural diversity and maintaining intact ecosystem function (recognizing that ecosystems are dynamic) would provide minor, long-term, Refuge-wide, positive effects on vegetation and terrestrial habitats.

Fish Populations and Natural Diversity

A management focus on perpetuating populations and native species in their natural diversity and maintaining intact ecosystem function (recognizing that ecosystems are dynamic) would provide minor, long-term, Refuge-wide, positive effects on fish populations and natural diversity.

Bird Populations and Natural Diversity

A management focus on perpetuating populations and native species in their natural diversity and maintaining intact ecosystem function (recognizing that ecosystems are dynamic) would provide minor, long-term, Refuge-wide, positive effects on bird populations and natural diversity.

Mammal Populations and Natural Diversity

A management focus on perpetuating populations, natural diversity, and native species while maintaining intact ecosystem function (recognizing that ecosystems are dynamic) would provide minor, long-term, Refuge-wide, and positive effects on mammal populations and natural diversity.



5.2.1.2 Impacts of the New Guidelines on the Human Environment

Those changes in the guidelines that have effects on the Human Environment would include:

- 1) an increased emphasis on improving formal consultation and coordination with tribal governments, regional and village corporations, and local village councils regarding issues and programs that could affect Native people, their communities, and subsistence use. (Section 2.4.9.2);
- 2) an increased management focus on ensuring local rural residents and the Federal Subsistence Regional Advisory Councils associated with the Refuge have a meaningful role and the opportunity to participate in the Federal Subsistence rule-making process. (Section 2.4.13);
- 3) a focus on perpetuating experiences that are consistent with the Range’s original purpose to “preserve unique recreation values” (Section 2.4.15)
- 4) a focus on perpetuating the distinctive qualities of the Refuge’s resources in their natural condition and retaining their wild character, (Section 2.4.11.1);
- 5) This Revised Plan assigns management direction to three categories—Minimal, Wild River, and Wilderness Management. None of the alternatives in this Revised Plan assign Refuge lands to the Intensive or Moderate management categories. Lands recommended in this plan for wilderness or wild river status are managed in the Minimal Management category and would be assigned to the Wilderness or Wild River Management categories only if Congress designated these lands and waters as part of the National Wilderness Preservation System (NWPS) or the National Wild and Scenic Rivers System (NWSRS).

Local Economy and Commercial Uses

Implementing the guidelines would have no effect on local economy and commercial uses.

Cultural Resources

A management focus on improving communications, consultations and cooperation with Tribal Governments, village councils, and Native organizations to discuss issues and concerns, and opportunities for mutual cooperation would provide long-term, Refuge-wide, positive effects to ensure the conservation and protection of cultural resources, and the continuation of traditional native use.

Subsistence

A management focus on perpetuating populations, natural diversity, and native species while maintaining intact ecosystem function would provide long-term, Refuge-wide, positive effects on the availability of subsistence resources and the opportunity for continued subsistence use. An increased management effort to improve communications, consultations and cooperation with local village residents, Tribal Governments and Native organizations, and Federal Subsistence Regional Advisory Councils associated with the Refuge would provide long-term, Refuge-wide, positive effects to ensure local rural residents have a meaningful role and the

opportunity to participate in the Federal subsistence rule-making process for the conservation and use of subsistence resources.

Visitor Services and Recreation Opportunities

A management focus promoting minimal to no evidence of human modifications or changes upon the landscape, including signs, kiosks, visitor facilities, or roads would have negligible to minor, long-term, Refuge-wide effects. Effects could be seen either as positive or negative depending upon the perspectives and expectations of the Refuge user. Under the 1988 Plan, the Refuge could authorize helicopter landings through a special use permit; however, none were issued on Arctic Refuge for recreational access. Thus, there would be no change in actual use of helicopters on the Refuge by implementation of the preferred alternative.

Wilderness Values

A management focus on less manipulation of the environment and promoting actions that facilitate solitude, self-discovery, self-reliance, remoteness, and primitive, unconfined recreational experiences would provide minor, long-term, Refuge-wide positive effects to wilderness values.

Special Designations

Implementing the guidelines would have no effect on special designations.

Public Health and Safety

Signage, marked trails, roads, public use cabins, or other similar visitor facilities may increase safe travel through wild areas. A management focus restricting visitor facilities in the Refuge may have negligible to minor, long-term, Refuge-wide effects on public health and safety. However, it may be necessary when emergencies occur on the Refuge, to deviate from policies and guidelines discussed in this Plan. Activities not normally allowed on the Refuge or under a specific management category may occur during or as a result of emergencies.

Refuge Operations

New guidelines require all management activities in designated wilderness be supported by an MRA and be found necessary for administration of the area as designated wilderness. Currently, only new activities must go through the MRA process. This change in direction would increase the paperwork burden on the Refuge but would enhance wilderness values and character. Effects would likely be minor, long-term and only for designated wilderness activities.

5.2.2 Wilderness Review

Only Congress can designate wilderness. Three Wilderness Study Areas (WSAs) have been identified and considered for wilderness recommendation. The administrative act of recommending an area for wilderness designation would have no effect on Refuge resources or operations. Areas recommended for wilderness would continue to be managed under the Minimal Management category (see Chapter 2, Section 2.3.3).

While the Refuge and the U.S. Fish and Wildlife Service (Service) do not have the authority to designate wilderness, the effects analysis included in this chapter describes the potential effects of wilderness designation. An area designated by Congress as wilderness is administered as part of the NWPS, in accordance with the Wilderness Act, and would be managed under the Refuge's Wilderness Management category (see Chapter 2, Section 2.3.4). Under Wilderness Management, administrative activities are subject to an MRA, and management activities must be found to be the minimum requirements necessary to administer the wilderness area. MRAs are not required for Minimal Management (please refer to Chapter 3 for a description of differences between Wilderness and Minimal Management).

5.2.3 Rivers Reviewed for Wild and Scenic Potential

Currently, most restrictions on public use are derived from the area's status as a Refuge and associated regulations (e.g., Refuge Administrative Act, the National Wildlife Refuge System Improvement Act, the Alaska National Interest Lands Conservation Act, etc.) or are enacted by State laws (e.g., Alaska Department of Fish and Game hunting regulations, Alaska Statute 19.40.210 prohibition of off-road vehicles from the Dalton Highway). Since all Refuge rivers are currently managed in the Wilderness or Minimal Management categories, general efforts to maintain wilderness character and/or manage the Refuge as a naturally-functioning ecosystem serve to maintain their free-flowing character and protect their outstandingly remarkable values (ORVs). The effects analysis that follows reflects these ORVs for the:

- Atigun River – Geologic and Recreational
- Marsh Fork Canning River – Recreational
- Hulahula River – Recreational and Cultural
- Kongakut River – Geologic, Recreational, and Scenic

Only Congress can designate a wild and scenic river. The Wild and Scenic Rivers Act suitability study process does not result in actual designation but only a determination of a river's suitability for designation.

The Wild and Scenic Rivers Act requires that rivers determined suitable be managed to maintain their free-flowing character and ORVs. Interim management prescriptions must be developed and followed to protect these qualities until congressional action regarding designation is taken.

Interim management prescriptions for protecting rivers eligible for suitability are typically developed to protect ORVs until suitability is determined at some future date. However, they are not included in this Plan because the timeline for suitability is concurrent with the Revised Plan. If it is determined that a river is eligible but not suitable for recommending designation, then the river returns to the underlying management (Minimal or Wilderness Management).

Refuge rivers found suitable but not recommended would receive interim management protection under all alternatives. In other words, the effect of not recommending rivers for designation would be that suitable rivers would continue to be protected by interim management prescriptions specific to preserving each river's ORVs and general protections afforded rivers with Refuge status. Similarly, those suitable rivers that are recommended will continue to be protected by interim management prescriptions specific to preserving each river's ORVs and general protections afforded rivers with Refuge status.

If Congress were to actively decide not to designate a river(s), then the interim management protections specific to preserving the river's ORVs would fall away, and the river would continue to be managed according to its underlying management category (either Wilderness or Minimal Management) and general protections afforded rivers with Refuge status.

If Congress were to designate any of the recommended rivers, the interim management prescriptions would stay in effect until a Comprehensive River Management Plan (CRMP) is completed. It would formalize the requirement to preserve the river(s) ORVs and other values found through inventory, in perpetuity. These rivers would be part of the National Wild and Scenic Rivers System (NWSRS) and be afforded the protections of the Wild and Scenic Rivers Act.

The interim management prescriptions and CRMPs are tailored to protect the specific ORVs identified during the eligibility evaluation for each suitable river. Therefore, the effects of management greatly depend on these ORVs. For example, if the ORV is "Culture," then the interim management prescription must explain what actions will be taken to protect cultural values. This would have an additional protective effect on cultural resources and subsistence uses. If the ORV is "Recreation," then the interim management prescriptions must explain what actions will be taken to protect the recreational characteristics for which it was found to have a Recreation ORV. This could affect visitor services, recreational opportunities, local economy, and commercial uses. Lastly, wild and scenic river protections are additive to those areas with wilderness designations; therefore, areas in wilderness additionally protected by the wild river designation would have the highest level of protection in the Refuge.

5.2.4 Common Effects of the Alternatives on Resource Categories

This section evaluates the effects that are common or consistent across all alternatives.

5.2.4.1 Common Effects to the Biophysical Environment

Glaciers

Arctic Refuge includes the most heavily glaciated region of the Brooks Range. Effects of the Refuge's current management actions on glaciers are negligible. Most of the Refuge's glaciers are in the area of the Brooks Range that is currently designated as wilderness. Alternatives B, D, and E would recommend wilderness designation for the Brooks Range WSA. If the Brooks Range WSA was designated as wilderness, all of the Refuge's glaciers would be in wilderness and there would be a long-term commitment to maintain the wilderness character of the area, including glaciers.

Alternatives B-E would recommend rivers for inclusion in the NWSRS that encompass glaciers at their headwaters in the Refuge (Hulahula and Atigun Rivers). The Atigun River

headwater glaciers in the Refuge were not evaluated in the Wild and Scenic River Review (only the lower 11-mile segment of the river in the Atigun Gorge was reviewed). The Atigun River headwater glaciers in the Refuge are currently categorized under Minimal Management; designation of the 11-mile Atigun River segment would not change the management category of its headwater glaciers. The Hulahula River headwater glaciers are currently managed under the Refuge's Wilderness Management category. If the Hulahula River were to be designated as a wild river, management of its headwater glaciers would be converted to the Wild River Management category.

Permafrost and soils

The construction of temporary facilities could result in impacts to soils and/or permafrost. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to thawing of buried ice and permafrost. Temporary facilities are allowed in wilderness; therefore, under all alternatives, the effects to permafrost and soils are anticipated to be minor, long-term, local to WSA-wide, and negative. Temporary facilities are also allowed in wild and scenic river corridors and along the Kongakut River; however, the Refuge would likely be more vigilant about monitoring impacts in these corridors, including impacts to soils and permafrost. Under all alternatives, effects to permafrost and soils are anticipated to be negligible, long-term, local, and positive for wild and scenic rivers and the Kongakut River.

Air quality

Under all alternatives, the effects to air quality are anticipated to be negligible to minor, short-term, and local in extent with no measurable long-term or cumulative effects. The Refuge and its current wilderness area are designated as Class II for air quality standards, which are up to 10 times less restrictive than Class I. Designation of more wilderness, wild and scenic rivers, or different management scenarios for the Kongakut River would have no effect on air quality. Wildfires do occur occasionally during the summer months on the Refuge and can negatively influence air quality. Ninety-eight percent of the Refuge (including designated wilderness) is under "Limited Management Option," meaning no suppression will occur unless a life-threatening situation or threats to communities exists. Some climate change models predict increased incidence of wildfires in boreal and arctic regions. Increased wildfire incidence would cause minor to moderate, regional, long-term negative effects on air quality.

Water Quality and Aquatic Habitats

Under all alternatives, the effects of visitor use on water quality and aquatic habitats are anticipated to be negligible to minor, local, and short-term. Possible negative impacts could arise from spills occurring during potential transfer and storage of fuels supporting boating, aircraft, or other public use activities. Permit stipulations for commercial operators limit storage of fuels on the Refuge. Scientific sampling equipment such as gauging stations could be installed in areas (or lands) not designated as wilderness to monitor water quality and quantity in aquatic habitats.

Human waste accumulation could result in negligible to minor diminished water quality in site-specific locations for a short duration with no long-term effects. Water quality monitoring at

the Refuge has not been conducted to identify impacts of human waste because it is expected that river water quality throughout the Refuge remains very clean compared to standards established by the Environmental Protection Agency for recreational waters.

Through a CRMP, ongoing inventory and monitoring of water quality and quantity efforts would be focused on the Refuge's wild rivers and coordinated with efforts elsewhere on the Refuge.

Vegetation and Terrestrial Habitats

Under all alternatives, the effects of visitor use on vegetation include: 1) direct effects of trampling upon vegetation; 2) indirect effects of soil and snow compaction; 3) damage to trees and shrubs; and 4) possible introduction of invasive plants. Disturbances to vegetation would be site-specific and restricted to areas receiving repeated use, such as base camps and aircraft accessible sites. It is anticipated that these effects would be negligible to minor, localized, short-term, and negative for wilderness, while positive for wild and scenic rivers and the Kongakut River.

Plant communities on the Refuge are slow growing and do not recover quickly from disturbance. If arctic and subarctic tundra plant communities are damaged to the point that bare ground is exposed, erosion could occur, and moderate to major, long-term, localized, and negative effects could occur.

Fish Populations and Natural Diversity

The location, distribution, or level of use by visitors could have negligible to minor effects on fishery resources. These effects would be negligible to minor, localized, short-term, and positive. Currently, there are no permittees offering guided fishing trips. If there were, permit conditions would likely limit the impacts of such activities.

Mammal Populations and Natural Diversity

Ecotourism has the potential to affect distribution of polar bears along the coast during fall congregations. Effects would be minimized by permit stipulations but could include dispersal of bears away from preferred food resources and decreased efficiency of feeding. Impacts are expected to be minor, site-specific to local, short-term, and negative.

Dall's sheep seem capable of sustaining the current level of harvest, but there are indications that the impact of trophy hunting and current Alaska Department of Fish and Game (ADFG) harvest regulations could change the genetic composition and behavioral patterns of the population.

5.2.4.2 Common Effects to the Human Environment

Local Economy and Commercial Uses

Under all Alternatives, Section 1003 of Alaska National Interest Lands Conservation Act (ANILCA) remains in effect. Oil and gas leasing and development are prohibited in the Refuge until authorized by Congress. Photography in wilderness as a commercial service would be allowed according to policy. Permittees would be limited to access methods and

equipment that are allowed for the public, including those uses allowed under section 1110 (a) of ANILCA, such as snowmachines, motorboats, airplanes, and non-motorized surface transportation. The State of Alaska and various oil companies have been pursuing the potential development of a natural gas pipeline from existing oil developments west of Arctic Refuge to Fairbanks and other areas of the State. If natural gas pipeline planning and on-the-ground efforts for its construction continue, there would likely be moderate, long-term, localized, and positive effects to the local economy, including communities near Arctic Refuge.

Cultural Resources

Federal and State laws and regulations would continue to provide direction for the management of cultural resources. Inventorying and monitoring would continue as required. People using Refuge lands for a variety of purposes might cause some damage to sites (intentionally or unintentionally). There is the potential to lose some sites to natural forces such as erosion. Effects would range from minor to major, long-term, and site-specific to localized. If there are impacts to properties eligible for National Register of Historic Places inclusion, the impacts are, by definition, not negligible. It is important to protect and preserve prehistoric and historic sites to the extent practicable. If not practicable to save, the site should be recorded.

Subsistence

The Arctic Village Sheep Management Area was reserved by the Federal Subsistence Board for federally qualified subsistence users from the villages of Arctic Village, Venetie, Kaktovik, and Chalkyitsik for sheep hunting to minimize conflicts and competition with general hunters in the area. The Red Sheep Creek and Cane Creek drainages in the Arctic Village Sheep Management Area were open to general sheep hunting from August 10–September 20 in 2007 and are no longer reserved only for federally qualified hunters.

Visitor Services and Recreation Opportunities

Several oil companies have been collecting data and planning for a natural gas pipeline along the Dalton Highway and Trans-Alaska Pipeline corridor, including an area near the Refuge's western boundary. If natural gas pipeline planning and on-the-ground efforts for its construction continue, services supporting access to, and overall awareness about, the recreational opportunities available on the Refuge's western boundary will increase and could cause minor to moderate, localized, long-term, and positive effects.

Wilderness Values

Oil companies have been planning for a natural gas pipeline in the utility corridor in which the Trans-Alaska Pipeline is located. If natural gas pipeline planning and on-the-ground efforts for its construction continue, effects to recreational opportunities for solitude and natural conditions along western boundary of Refuge could cause moderate to major, long-term, localized, and negative impacts to the visitor experience.

Special Designations

There would be no effects to the Neruokpuk Lakes PUNA and the Firth-Mancha RNA. There would be no effects to the Shublik Springs Research Natural Area as a result of wilderness designation or Kongakut River management actions. There would be no effect to the MPA as a result of wild and scenic river designations. There would be no effects to the Refuge's three wild rivers as a result of wild and scenic river designations or Kongakut River management actions.

Public Health and Safety

Human waste accumulations at the Refuge's elevations and latitudes may not decompose for decades—and possibly centuries. There would be minor to moderate, site-specific, long-term, and negative effects on public health.

Refuge Operations

Based on the long-range planning and budget forecasts for the Department of the Interior (DOI) and the Service, appropriations and agency funding are expected to be flat or decreasing. The Service would be limited in operational funds, which would have a moderate to major effect on future personnel staffing and operational capacities. Some needed positions would not be filled. Some programs would be reduced or eliminated based upon current program needs and priorities. The lack of staffing would result in an inability to ensure adequate resource management oversight, provision of visitor use activities, and planning for the future. CRMPs and the identification of user capacities need to be completed for all three existing wild rivers; user capacities could affect many of the human environment categories (wilderness values, recreation opportunities, etc.). Additionally, MRAs need to be completed for all past and future administrative actions in designated wilderness. These are examples of some of the effects to management operations in the future. Overall, the effects to Refuge operations could be moderate to major, long-term, Refuge-wide, and negative. Once planning is completed, monitoring protocols and other management controls would be put into place, which would reduce the amount of time dealing with resource issues.

5.3 Effects of Alternative A (Current Management)

This section evaluates the implication or impacts on resources categories in each major issue: wilderness, wild and scenic rivers, and the Kongakut River.

Introduction

Wilderness – Approximately eight million acres of wilderness would continue to be managed as wilderness. No new areas would be recommended for wilderness designation. By not recommending wilderness designation in the Coastal Plain, the 1002 Area could be opened more easily by Congress to oil and gas.

Wild and Scenic Rivers – Alternative A proposes to complete eligibility and suitability studies but not recommend any rivers. The suitability study preliminarily determined that four of the Refuge's rivers are suitable for wild river designation: Atigun, Marsh Fork Canning, Hulahlula, and Kongakut. The effects described here are specific to a “no recommendation” alternative, but even without a recommendation for designation, the ORVs for the four suitable rivers still need to be protected. Interim management prescriptions will be required for all four rivers in Alternative A.

Kongakut River - For the Kongakut River, group size limits exist for commercially guided groups (7 hikers, 10 floaters), and guides are limited to one group on a river at one time. There are no group size limits for non-guided visitors; however, non-guided visitors are encouraged to limit their groups to the same size as commercial groups. Commercial service providers have special use permits, and Refuge staff conduct occasional compliance checks. In the Kongakut valley, air-taxi special use permits require operators to limit landings to non-vegetated surfaces only. Subject to safety concerns and weather, operators must maintain a minimum altitude of 2,000 feet above ground level flight operations with no intentional low flights over camps or people. Aircraft operations cannot harass wildlife or interfere with Refuge visitors or subsistence users. Visitor use monitoring occurs every other year or less frequently, and campsite conditions are monitored periodically.

5.3.1 Impacts to the Biophysical Environment from Alternative A

Permafrost and soils

Wilderness - Areas of the Refuge not currently designated as wilderness are managed under the Refuge's Minimal Management category. Temporary facilities may be authorized, and these could affect permafrost and soils. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to thawing of buried ice and permafrost. If a temporary facility were to be constructed, the effect could be minor to moderate, short to medium-term, site-specific, and negative, depending on the nature of the facility.

Wild and Scenic Rivers –While no rivers would be recommended, interim management prescriptions would result in negligible, long-term, local, positive effects on soils along river corridors of non-designated rivers that receive public use. However, visitor use might still damage soils and permafrost, for example, at heavily used campsites, resulting in minor, medium to short-term, site-specific, and negative effects.

Kongakut River – Current regulations for visitor use on the Kongakut River have minor, medium-term, site-specific, positive effects on permafrost and soils by limiting ground surface disturbance at landing areas and campsites.

Water Quality and Aquatic Habitats

Wilderness – Proposing no new wilderness areas would not affect water quality and aquatic habitats in non-designated areas. Water bodies in designated wilderness would continue to benefit from the high level of habitat protection that wilderness affords.

Wild and Scenic Rivers – While no rivers would be recommended, interim management prescriptions would result in negligible, long-term, local, positive effects on water quality and aquatic habitats.

Kongakut River – The Kongakut River currently receives an average of 239 visitors per year, the highest visitor use of any river on Arctic Refuge. Visitor use (hiking, hunting, and camping in the river corridor or floating the river) under current management would cause negligible, short-term, site-specific, negative impacts to water quality.

Vegetation and Terrestrial Habitats

Wilderness – Designated wilderness and Minimal Management could allow temporary facilities. Under this alternative, effects could range from minor to major, long-term, site-specific, and negative.

Wild and Scenic Rivers – While no rivers would be recommended, interim management prescriptions would result in negligible, long-term, local, and positive effects on vegetation and terrestrial habitats. However, visitor use may damage soils and permafrost, for example, at heavily used campsites, resulting in minor, medium to short-term, site-specific, and negative effects.

Kongakut River – Current regulations for visitor use on the Kongakut River have minor, medium-term, site-specific, and positive effects on vegetation and habitats, by limiting disturbance at landing areas and campsites.

Fish Populations and Natural Diversity

Wilderness – No effects on fish populations and natural diversity would occur if no new wilderness recommendations are made.

Wild and Scenic Rivers – While no rivers are recommended, interim management prescriptions would have negligible, long-term, local, and positive effects.

Kongakut River – The Kongakut River is the most popular remote recreational destination on the Refuge, and most visitors to the river undertake float trips. Direct negative impacts from harvest (especially Dolly Varden and arctic grayling) and disturbance by floaters are thought to be negligible, short-term, site-specific to local, and negative. Indirect impacts from substrate disturbance by foot traffic in and out of the river can lead to increased turbidity, especially in coveted camping sites at the confluence of feeder streams. However, such

impacts are also thought to be negligible, short-term, site-specific to local, and negative to fish populations and natural diversity.

Bird Populations and Natural Diversity

Wilderness – No effects on bird populations and natural diversity would occur if no new wilderness recommendations are made.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on bird populations and natural diversity under this alternative. Riparian areas tend to have higher density and diversity of birds compared to surrounding habitats.

Kongakut River – Maintaining current management of the Kongakut River would result in minor, short-term, site-specific, and negative impacts on bird populations, primarily through disturbance of breeding, feeding, and molting individuals.

Mammal Populations and Natural Diversity

Wilderness – No effects on mammal populations would occur if no new wilderness recommendations are made.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on mammal populations and natural diversity under this alternative.

Kongakut River – Maintaining current management of the Kongakut River would result in minor, short-term, site-specific, and negative impacts on mammal populations through disturbance of migratory (caribou) and resident species.



5.3.2 Impacts to the Human Environment from Alternative A

Local Economy and Commercial Uses

Wilderness – There would be no effect to the local economy or commercial uses. Commercial services would continue as they have and would not be restricted in any way. No additional wilderness designation in the Coastal Plain could allow for the 1002 Area to more easily be opened by Congress to oil and gas, preserving this potential economic opportunity.

Wild and Scenic Rivers – There would be no to negligible, short-term to long-term, local, and negative effects to the local economy and commercial uses based on proactively managing the Refuge's four suitable rivers according to interim management prescriptions.

Kongakut River – Continuation of current management on the Kongakut River could have effects on local economy and commercial uses. Because permits are currently issued non-competitively, commercialization of the Kongakut could continue to increase, possibly to an unsustainable level. Current Refuge management allows for a nearly unchecked amount of commercial use, which maximizes the river's contribution to local and State economies. Additionally, visitors to the Kongakut often travel through Arctic Village or Kaktovik, resulting in an increase in business for local service providers. However, if experiential conditions continue to erode, at some point the Kongakut could cease to offer the experience its visitors are seeking, thus potentially displacing visitors whose standards for wilderness experience opportunities are not met by river conditions. Displacement could be to other areas in or outside the Refuge. If displacement occurred in the Refuge, the economic and commercial opportunities would not be lost; but economic and commercial opportunities might be lost if displacement occurred outside the Refuge. Some guiding services have informed Refuge staff that the current conditions on the Kongakut (i.e., crowding, excessive overflights, human waste accumulations, etc.) have already driven them either to stop operating in Arctic Refuge or to offer trips on other Arctic Refuge rivers, such as the Marsh Fork Canning or Hulahula Rivers. The concentration of visitors on the Kongakut has displaced, and may continue to displace, visitation elsewhere and may result in crowding and impacts to other Refuge rivers. If the current management strategy continues to be applied, short-term effects could be minor to moderate, local, and negative; while the long-term effects could be moderate to major, local, and negative.

Cultural Resources

Wilderness - People using wilderness for a variety of purposes might damage cultural resources or sites (intentionally or unintentionally). There is also the potential to lose some sites to natural forces such as erosion. Effects would range from minor to major, long-term, site-specific, and negative.

Wild and Scenic Rivers – Cultural resources on the North Slope and Coastal Plain are on or near the surface of the tundra and tend to be oriented along river corridors and coastal beaches. Impacts could occur from people using Refuge lands and waters for a variety of purposes, which could cause damage to cultural resources or sites (both intentionally and unintentionally). The effects would range from minor to major, long-term, site-specific, and negative. Interim management prescriptions could help mitigate these effects. To comply with the Wild and Scenic Rivers Act, the Refuge would maintain the Cultural ORV on the Hulahula River. Effects to cultural resources on the Hulahula River would be minor to major, long-term, site-specific, and positive.

Kongakut River – Due to the high level of visitation to the Kongakut River drainage by hikers and floaters, cultural resources in the area could be threatened by intentional or inadvertent disturbance. However, the Kongakut has received high levels of visitation for at least two decades, and cultural resource damage may have already occurred. Continued effects are likely to range from minor to major, long-term, site-specific, and negative.

Subsistence

Wilderness – There would be no effect to subsistence opportunities, uses, or resources. Traditional access and subsistence uses would continue to be allowed according to current regulations and policies.

Wild and Scenic Rivers – There would be no effect to subsistence opportunities, uses, or resources. Traditional access and subsistence uses would continue to be allowed according to current regulations and policies.

Kongakut River – There would be no effect to subsistence opportunities, uses, or resources. Subsistence use of the Kongakut is minimal and generally occurs outside the primary recreation seasons.

Visitor Services and Recreation Opportunities

Wilderness – Continuation of current management practices could have effects on visitor services and recreational opportunities. Permits for visitor services would continue to be awarded on either a competitive or non-competitive basis, and proposed activities would be evaluated based on whether or not they occur in designated wilderness. If visitation to the western boundary of the Refuge and popular drainages continues to increase, it would negatively affect recreational opportunities for solitude and experiencing natural conditions. These impacts are likely to be minor or moderate, long-term, local, and negative.

Wild and Scenic Rivers – There would be no effect on visitor services and recreation opportunities under this alternative.

Kongakut River – The current management allows for nearly unrestricted recreational opportunities. There are no limits to the number of recreational guides or air-taxis offering services on the Kongakut River, nor are there any restrictions to private users. Unguided trips have no group size limits, while guided trips are limited to 7 hikers or 10 floaters. Private airplanes may land on any suitable surface, whether vegetated or unvegetated. The lack of restrictions and/or limits may result in degradation of the Kongakut's physical and experiential resources. Because this river flows through arctic habitats, physical damage (e.g., hardened campsites, trailing, etc.) may be irreparable, or at best will take many years to recover. These effects are likely to be moderate, long-term, local, and negative.

Wilderness Values

Wilderness – The established WSAs would not receive the protections afforded by the Wilderness Act. Non-wilderness areas would continue to be managed in the administrative Minimal Management category, which includes most of the protections and prohibitions as designated wilderness. However, this is an administrative management category subject to

change and does not have the enduring statutory protections afforded by designated wilderness. These impacts are likely to be minor, long-term, Refuge-wide, and negative.

Wild and Scenic Rivers – Implementing interim management prescriptions on the Refuge’s four suitable rivers would have no effect on wilderness values.

Kongakut River - Although the Kongakut River and its tributaries flow entirely in designated wilderness, the river offers what might be the lowest quality wilderness experience on the entire Refuge. During peak periods, visitors to the Kongakut are almost guaranteed to encounter at least one other group, to hear multiple airplanes daily, and to see visible impacts from previous visitors. For most visitors, this doesn’t constitute a high-quality wilderness experience. Current levels of visitation do not meet many people’s standards for wilderness opportunities for solitude, resources in a natural condition, remoteness, quiet, and other key wilderness character indicators. Under current management, the quality of wilderness recreational opportunities could continue to degrade. However, the high level of freedom and unconfined recreation offered on the Kongakut may balance the degradation. These effects are likely to be minor to moderate, long-term, local, and positive or negative.

Special Designations

Wilderness – There would be no effects to any of the Refuge’s special designation areas under this alternative.

Wild and Scenic Rivers – There would be no effects to any of the Refuge’s special designation areas under this alternative.

Kongakut River – There would be no effects to any of the Refuge’s special designation areas under this alternative.

Public Health and Safety

Wilderness – This alternative would have no effect on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Wild and Scenic Rivers – This alternative would have no effect on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Kongakut River – The accumulations of human waste found along the Kongakut may pose a public health risk. In the arctic, human waste probably accumulates faster than it decomposes, particularly at popular campsites, put-ins, and take-outs. In arctic environments, decomposition could require years and possibly decades. Effects on public health and safety are likely to be minor, long-term, local, and negative.

Refuge Operations

Wilderness – This alternative would have no effect on Refuge operations; no additional administrative tasks would be required regarding designated wilderness. Currently, DOI and Service policies require an MRA and an ANILCA Section 810 analysis for all special use

permits (commercial service providers, biological and cultural research and monitoring, access, etc.) and any new administrative activity in designated wilderness.

Wild and Scenic Rivers – Implementing interim management prescriptions for the Refuge’s four suitable rivers would have no effect on staff and Refuge operations.

Kongakut River – Under this alternative, there would be no effect on Refuge operations.

5.3.3 Cumulative Effects of Alternative A

Under this alternative, no additional wilderness areas would be recommended. There would be no foreseeable cumulative effects to the biophysical and human environments as a result of this alternative, with the exception of the lack of permanent statutory protection afforded by designated wilderness. No additional wilderness designation in the Coastal Plain could allow for the 1002 Area to more easily be opened by Congress to oil and gas. Lands outside designated wilderness are managed as Minimal Management.

Four rivers would be suitable for wild and scenic river designation but would not be recommended. There would be negligible cumulative effects to the biophysical and human environments. Interim management prescriptions would protect ORVs.

Management actions for the Kongakut River would result in overall negligible to minor cumulative effects to the biophysical and human environments.

As visitor use increases, there is the potential for some minor cumulative effects to the biophysical and human environments, and particularly to visitor experience. These effects would be cumulative to the effects of climate change, development activities, and management decisions made by others throughout the region.

5.4 Effects of Alternative B

This section evaluates the implication or impacts on resources categories in each major issue: wilderness, wild and scenic rivers, and the Kongakut River.

Introduction

Wilderness – Approximately eight million acres of wilderness would continue to be managed as wilderness. Alternative B recommends the Brooks Range WSA (5.4 million acres) for wilderness designation. If approved by Congress, this would put all of the Brooks Range in the Refuge under wilderness management, replacing the existing Minimal Management category. Management strategies are similar for Wilderness and Minimal Management, but wilderness is a statutory designation that represents a permanent commitment to maintain natural conditions. Whereas Minimal Management can be changed through a public process initiated by the Service, changes in wilderness designation are exceedingly rare and require an act of Congress.

No additional wilderness designation in the Coastal Plain could allow for the 1002 Area to more easily be opened by Congress to oil and gas.

Wild and Scenic Rivers – Alternative B recommends wild river designation for three of the Refuge's suitable rivers: Kongakut, Marsh Fork Canning, and Hulahula. The lower portion of the Hulahula River is owned by the Kaktovik Iñupiat Corporation (KIC). Those portions of the Hulahula River that flow through KIC lands would be recommended, and corridor management would be made in partnership with KIC. Wild and Scenic Rivers Act protections to river corridors are additive to wilderness designations; therefore, recommended rivers in designated wilderness, such as the Kongakut River, would have the highest level of protection in the Refuge. Additional protections proposed in the Kongakut River for this alternative may be redundant with protections required by the act.

Rivers recommended for wild river status must be protected until Congress acts to designate or reject designation. Pending congressional action, the Service would use interim management prescriptions to manage each recommended river for the ORVs for which it was found eligible.

The effects described in this section are specific to those rivers recommended for inclusion in the NWSRS. However, even without a recommendation for designation, the ORVs of rivers found suitable still need to be protected. Therefore, under this alternative, interim management prescriptions would be implemented indefinitely for the Atigun River.

Kongakut River – Alternative B proposes that Kongakut River management issues be addressed in a Visitor Use Management and/or Wilderness Stewardship step-down plan. Among other things, the step-down plan(s) would develop long-term monitoring protocols. Until the step-down plan(s) is completed, the Service would revise the river's current monitoring program of physical and social conditions to evaluate the effectiveness of management actions.

Alternative B would also establish several new programs to protect resources in the Kongakut River Valley. The Service would develop educational materials for the public with targeted messages explaining preferred visitor practices and strategies for minimizing impacts, such as proper waste disposal, avoiding wildlife impacts, and alleviating crowding

among groups. The Service would provide the public with schedules of proposed guided trip launch dates and past visitor use activity patterns. Rehabilitation of heavily impacted sites would be conducted when necessary.

5.4.1 Impacts to the Biophysical Environment from Alternative B

Wilderness – With wilderness designation, restrictions on activities that could damage Refuge resources are less likely to change over time and are more likely to be enforced, providing greater certainty of long-term protection for wildlife and habitats. By protecting natural conditions, wilderness designation would also have minor to major, long-term, positive effects on the value of the WSA for ecological research and monitoring. However, administrative activities in wilderness must be found to be the minimum requirements for the administration of the area as wilderness (see Chapter 2, Section 2.3.4). This is interpreted to include collection of data required for conservation of fish, wildlife, and habitats in the designated area. Wilderness designation would preclude some technologies and installations associated with biophysical research and monitoring. It would also preclude some studies aimed at understanding changes over broader spatial scales, such as those resulting from climate change, that may not have direct applicability to management of the wilderness area itself.

Wild and Scenic Rivers – Implementing interim management prescriptions for three of the Refuge's suitable rivers would result in negligible, long-term, local, and positive effects. However, if these rivers are designated by Congress, the effects would be minor long-term, local, and positive.

Kongakut River – Alternative B recommends management tools to address resource concerns in the Kongakut River Valley. The Kongakut River is also afforded protections from being located in designated wilderness. Additionally, the river has preliminarily been determined suitable for wild river designation, and the Refuge would maintain the river's ORVs by implementing interim management prescriptions.

Permafrost and Soils

Wilderness – Alternative B recommends additional portions of the Refuge for wilderness designation. If Congress were to designate the Brooks Range WSA, it would switch from Minimal Management to Wilderness Management. Management strategies are similar for each, but wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have minor, long-term, WSA-wide, and positive effects because of the additional statutory restrictions in managing wilderness.

Temporary facilities could damage soils and permafrost, and temporary facilities may be authorized in designated wilderness. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to thawing of buried ice and permafrost. They could have site-specific, moderate, medium-term, and negative effects.

Wild and Scenic Rivers – For those rivers that are suitable but not recommended, interim management prescriptions would be implemented indefinitely, resulting in negligible, long-term, local, and positive impacts to permafrost and soils in river corridors. For those rivers designated by Congress, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects. Visitor use could still damage soils and permafrost, for example, at heavily

used campsites, resulting in minor to moderate, short- to medium-term, site-specific, and negative effects.

Kongakut River – Refuge visitors have the potential to damage soils and permafrost by trampling, particularly at campsites and access points such as landing areas. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to melting of buried ice and permafrost. Enhanced management of visitor use in the Kongakut River area under Alternative B would decrease site-specific impacts. Site-specific disturbances from visitors occur extensively up and down the Kongakut River corridor, so enhanced management would also decrease impacts at the local scale. This alternative would have minor to moderate, long-term, local, and positive impacts on permafrost and soils in the Kongakut River corridor.

Water Quality and Aquatic Habitats

Wilderness – Wilderness designation provides a high level of long-term protection for aquatic habitats. Wilderness designation of the Brooks Range WSA would result in minor, long-term, WSA-wide, positive effects.

Wild and Scenic Rivers – Interim management prescriptions would be implemented indefinitely for those rivers that are suitable but not recommended; these prescriptions would result in negligible, long-term, local, and positive impacts to water quality and aquatic habitats in these river corridors. If recommended rivers are designated by Congress, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects.

Kongakut River – Educational outreach about proper waste disposal and minimizing other visitor impacts, along with monitoring the effectiveness of management actions, would have minor, long-term, local, and positive effects on water quality and aquatic habitats in the Kongakut River basin. Water quality and aquatic habitats can be affected by increased visitor use through increased vegetation trampling and soil compaction, which increases the potential for runoff and sediment loading.

Vegetation and Terrestrial Habitats

Wilderness – Alternative B would recommend additional portions of the Refuge for wilderness designation. If Congress were to designate the Brooks Range WSA, it would convert from Minimal to Wilderness Management. Although management strategies are similar for Wilderness and Minimal Management, wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have a minor, long-term, WSA-wide, and positive effect because of the additional restrictions Wilderness Management provides.

Temporary structures may be authorized in designated wilderness. They could have minor to moderate, medium-term, site-specific, and negative effects on vegetation and terrestrial habitats.

Wild and Scenic Rivers – Interim management prescriptions would be implemented indefinitely for those rivers that are suitable but not recommended; these prescriptions would result in negligible, long-term, local, and positive impacts to vegetation and terrestrial habitats in river corridors. If Congress were to designate the recommended rivers, CRMPs would be

prepared, resulting in minor, long-term, local, and positive effects. However, visitor use could still damage vegetation and terrestrial habitats, for example, at heavily used campsites, resulting in minor, medium to short-term, site-specific, and negative effects.

Kongakut River – Refuge visitors may damage vegetation and habitats, particularly at campsites and access points such as landing areas. Potential damage includes direct effects of trampling on vegetation, indirect effects of soil and snow compaction as a result of trampling, breakage of trees and shrubs, possible introduction of invasive plants, and exclusion of wildlife from riparian and adjacent habitats. Most disturbances to vegetation are site-specific and restricted to areas receiving repeated use, such as hunting camps near fixed-wing aircraft-accessible sites and campsites used by floaters. These areas are presently monitored and assessed for negative impacts. Disturbances are local in scale, as site-specific disturbances occur extensively along the Kongakut River corridor. Alternative B would have minor to moderate, long-term, local, and positive impacts on vegetation and habitats in the Kongakut River area.

Fish Populations and Natural Diversity

Wilderness – Wilderness designation provides a high level of long-term protection for fish populations and natural diversity. Many rivers and streams occur in the proposed Brooks Range WSA. Effects of designation of the Brooks Range WSA on fish populations resulting from enhanced habitat protections would be minor, long-term, WSA-wide, and positive.

Wild and Scenic Rivers – Interim management prescriptions would be implemented indefinitely for those rivers that are suitable but not recommended, resulting in negligible, long-term, local, and positive impacts to fish populations and natural diversity. If Congress were to designate recommended rivers, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects.

Kongakut River – Dolly Varden and grayling are popular fish for anglers on the Kongakut River. Harvest of these fish species is unknown and thought to be low. Developing educational materials on proper catch-and-release techniques could lead to increased survival rates of released fishes, resulting in negligible, long-term, local, and positive effects.

Bird Populations and Natural Diversity

Wilderness – Maintaining natural conditions would have positive effects on bird populations in the Wilderness Study Area. Because most bird species are migratory, beneficial effects could be expressed over a larger area than the Brooks Range WSA. Under current management, disturbance to birds and alteration of their habitats is minimal. However, wilderness designation, with its long-term commitment to maintaining natural conditions, could have minor, long-term, regional or greater, and positive effects.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on bird populations and natural diversity under this alternative. Riparian areas tend to have higher density and diversity of birds compared to surrounding habitats.

Kongakut River – Enhanced management of human use of the Kongakut River Valley would have negligible to minor, long-term, site-specific, and positive effects on bird populations and natural diversity. Monitoring impacts to habitats by visitors would lead to development of

conservation measures to mitigate visitor impacts on birds. Educational materials would benefit birds by helping visitors reduce disturbance to nesting raptors and other species, and minimize impacts to bird habitats.

Mammal Populations and Diversity

Wilderness – Wilderness designation would result in minor, long-term, WSA-wide to regional, and positive effects in the Brooks Range on mountain species like Dall's sheep and Alaska marmots. Wilderness designation has a more permanent and stringent commitment to protect mammal populations and habitats.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on mammal populations and natural diversity under this alternative.

Kongakut River – Enhanced management of human use of the Kongakut River Valley would have negligible to minor, long-term, site-specific, and positive effects on mammal populations. Monitoring impacts to habitats by visitors would lead to development of conservation measures to mitigate visitor impacts on mammals. Educational materials would benefit mammals by helping visitors reduce disturbance to resident and migratory species, and minimize impacts to mammal habitats.



5.4.2 Impacts to the Human Environment from Alternative B

Wilderness – The Brooks Range WSA excludes approximately 39,549 acres of Refuge land in the vicinity of Arctic Village and Old John Lake. The area is not qualified for wilderness designation because of its close proximity to an active community with its airport, generator complex, daily use areas, and notable concentrations of private Native allotments. An area of 189,117 acres (inclusive of the non-qualified area) of Refuge land near Arctic Village has been determined to be non-suitable for wilderness designation through an evaluation of manageability. In determining manageability, the Service considers factors such as land status and Service jurisdiction, existing inholdings and private rights, Refuge management activities, and public uses. This area is non-suitable because it is a high use area for Arctic Village residents, and the extent of authorized activities such as firewood and house log cutting would make it difficult to manage as wilderness. Motorized activity is frequent in this area, and it contains a large number of inholdings.

The Brooks Range WSA is currently managed under the Minimal Management category. Under current management, public use of the Refuge is managed similarly in designated wilderness and areas not designated as wilderness. Most restrictions on public use are derived from the area's status as a refuge and regulations. Public use is subject to Federal regulations implementing Federal laws (e.g., ANILCA, Refuge Administration Act), State laws (e.g., Alaska Statute 19.40.210, which prohibits off-road vehicles from the Dalton Highway), and State regulations (e.g., the State of Alaska hunting and fishing regulations).

Wild and Scenic Rivers – Alternative B would recommend three of the Refuge's rivers for inclusion in the NWSRS (Hulahula, Marsh Fork Canning, and Kongakut), and interim management prescriptions would be implemented indefinitely on the Atigun River. If Congress were to designate any of the recommended rivers, CRMPs would be developed and implemented for the continued protection of these rivers and their associated values. CRMPs and interim management prescriptions could lay out strategies that might affect the local economy, commercial uses, cultural resources, visitor services, recreational opportunities, and wilderness opportunities.

Kongakut River – Under this alternative, there would continue to be an unlimited number of commercial operators offering trips on the Kongakut River. The Kongakut is the most visited river in Arctic Refuge and has high name recognition. Recreational guiding services from across the country offer trips on this remote river. These operators—guides and air-taxis—would continue to have specific Kongakut River permit conditions, and guides would continue to be restricted to one guided trip on a river or water body at any given time. Visitor use monitoring of physical impacts and enforcement concerns would continue to occur occasionally. The existing river monitoring program would be revised, management would be more proactive than hands-off, launch schedules would be published, and select impacted areas would be rehabilitated. Effects are likely to be moderate, long-term, local, and positive. This alternative proposes to use a Refuge-wide step-down management plan to address specific areas of concern and management strategies. Because this step-down plan has not been developed concurrently with the Revised Plan, the effects of this component of the alternative have not been analyzed.

Local Economy and Commercial Uses

Wilderness – Designation of the Brooks Range WSA as wilderness could have effects on commercial uses. In designated wilderness, the Wilderness Act of 1964 and Service wilderness policy prohibit commercial enterprises with few exceptions. Visitor services that allow people to access the Refuge, such as guides and transportation companies, are allowed. Other commercial enterprises, such as commercial filming, are only allowed according to policy. Designation would provide more wilderness for exploration and could potentially attract more visitors to the area, resulting in increased business prospects for recreation guides, air operators, and service providers in local communities. Big-game hunting guides in guide use areas ARC 6 and ARC 09-14 could have to comply with stricter guidelines (e.g., no base camps, no airplanes in camp, perhaps limits to the amount of flight time, etc.). There could be a burden on commercial operators as a result of wilderness designation of the Brooks Range WSA. These impacts are likely to be minor to moderate, long-term, specific to the Brooks Range WSA, and negative.

Wild and Scenic Rivers – There would be no to negligible, short-term to long-term, local, and negative effects to the local economy and commercial uses based on proactively managing rivers according to interim management prescriptions.

If Congress were to designate the recommended rivers, there would be minor to moderate, long-term, local, and negative effects on the local economy and commercial uses as a result of implementing each river's CRMP. With designation, there is authority to limit and control public use, which could result in negative effects to local economies and commercial use providers.

Kongakut River – A step-down plan would likely have effects on the local economy and commercial uses. Step-down planning would be done in conjunction with key stakeholders and the public. The effects are likely to be moderate, long-term, local, and positive.

Cultural Resources

Wilderness – Potential wilderness designation could have a minor, long-term, WSA-wide, and positive effect on cultural resources. Wilderness areas would restrict potential facilities and recreational “improvements,” most commercial enterprises, and—to varying degrees—helicopters and installations. Wilderness designation could provide further long-term protection for cultural resources and traditional lands, waters, and resources used by local residents and serve to perpetuate the natural conditions in which their cultures evolved.

People using wilderness for a variety of purposes might cause some damage to sites (intentionally or unintentionally). There is also the potential to lose some sites to natural forces such as erosion. Effects would range from minor to major, long-term, site-specific, and negative.

Wild and Scenic Rivers – Cultural resources on the North Slope and Coastal Plain are on or near the surface of the tundra and tend to be oriented along river corridors and coastal beaches. Impacts could occur from people using Refuge lands and waters for a variety of purposes, which could cause damage to cultural resources or sites (both intentionally and unintentionally). The effects would range from minor to major, long-term, site-specific, and negative or positive. Interim management prescriptions could mitigate these effects. Under this alternative, the Hulahula River is recommended for wild river designation. The Hulahula

has a Cultural ORV, and the Refuge is required to manage the river to maintain this ORV. Therefore, this river would have a higher level of protection for cultural resources.

Designation of recommended rivers would result in minor to moderate, long-term, local, and negative or positive effects to wild and scenic rivers.

Kongakut River – Education and outreach emphasizing stewardship of cultural resources in the Kongakut River drainage would likely minimize potential impacts. Cultural resources would be protected and managed in accordance with Federal and State laws. Visitors to the Kongakut could cause some damage to sites (intentionally or unintentionally), and some sites or resources could be lost to natural forces. The overall impact on cultural resources would be consistent with the past. The effects range from minor to major, long-term, site-specific, and negative or positive.

Subsistence

Wilderness – Designation of the Brooks Range WSA could provide another level of long-term protection to habitats and natural conditions, especially those found near Arctic Village and Venetie, and serve to perpetuate the subsistence resources they are so dependent upon. Designation might also limit potential encroachment from development. Designation would not restrict subsistence users from utilizing resources in the Refuge, and the right of subsistence users to conduct traditional activities using traditional modes of transportation would continue. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Designation could increase visitor use near Arctic Village's traditional and subsistence use areas, which could increase conflicts between locals and visitors. In general, subsistence uses in wilderness would continue as they have under Minimal Management, and the harvest of subsistence resources would continue. These impacts would likely be minor, long-term, local, and positive.

Wild and Scenic Rivers – Under this alternative, interim management prescriptions combined with educational outreach regarding cultural and subsistence use in drainages recommended as wild rivers could improve understanding, and reduce real and/or perceived conflict, between local users and non-local visitors. The effects are likely to be minor, long-term, local, and positive. Designation would result in minor to moderate, long-term, local, and negative or positive effects because designation could limit or control public use, ensuring fewer conflicts between subsistence and public users.

Kongakut River – Educational outreach regarding cultural and subsistence use in the Kongakut River drainage could improve understanding, and reduce real and/or perceived conflict, between local users and non-local visitors. The effects are likely to be minor, long-term, local, and positive.

Visitor Services and Recreation Opportunities

Wilderness – Designation of the Brooks Range WSA as wilderness could have effects on visitor services and recreational opportunities. Designation of more wilderness could positively affect recreational opportunities for solitude, exploration, and freedom. All activities, including commercial services, biological and cultural research and monitoring, and access in newly designated wilderness, would have more restrictions. Dalton Highway road

access to the Brooks Range WSA makes it possible and more economically feasible for visitors to reach designated wilderness without requiring aircraft support. These impacts are likely to be minor to moderate, long-term, specific to the Brooks Range WSA, and positive.

Wild and Scenic Rivers – Implementing interim management prescriptions would have no effect on visitor services and recreation opportunities. However, if Congress were to designate any of these rivers, the Refuge would be required to determine the user capacity of the designated rivers. If the number of visitors exceeds the determined user capacity, the Refuge might need to limit use. The effects would likely be minor to moderate, long-term, local, and positive or negative. Visitor experience could be enhanced by limiting use; however, for those visitors who may not be able to experience the river, they would be frustrated due to lack of river access. Any limitations on use of designated rivers could potentially displace visitors to other rivers in the Refuge.

Kongakut River – This alternative proposes to adopt management strategies based on a Refuge-wide step-down plan. The benefit of this would be that use on the Kongakut might not be displaced to other areas of the Refuge, avoiding public use conflicts in other areas. The drawback would be that experience issues specific to the Kongakut River corridor might not receive adequate attention under a Refuge-wide plan. However, as the step-down plan unfolds, it is likely to have impacts on visitor services and recreational opportunities. The effects are likely to be minor to moderate, long-term, local, and positive or negative.

The other components of this alternative would also likely have effects. Developing educational outreach materials with preferred practices and strategies for minimizing impacts would likely raise the level of awareness of commercial and private users. In turn, this could lead to higher quality experiences for all users by reducing the amount of physical and experiential impacts occurring on the river. However, none of these messages would be regulations; therefore, they would not be enforceable. Educational outreach may not be a strong enough tool to produce the desired effects. The effects are likely to be minor to moderate, long-term, local, and positive.

Improving monitoring programs for physical and social conditions could better inform management about areas of concern, thus allowing management to take appropriate, responsive action before continued degradation occurs. However, conducting site-specific monitoring and rehabilitation could result in Refuge staff contributing to crowding on the river and potentially adding to cumulative negative impacts. These effects are likely to be minor, long-term, local, and positive or negative.

Publishing schedules of past guided and non-guided visitor use (currently available through commercial permit client use reports) would likely do little to redistribute use across the season, since demand is driven by two temporally discrete events: the caribou migration and the Dall's sheep hunting season. This concentration of use is compounded by the fact that water levels are usually better for floating during these times. The effects are likely to be minor, long-term, local, and positive.

Wilderness Values

Wilderness – Designating additional wilderness would have a positive effect on wilderness values. An MRA would be required on all new activities, and helicopter access would be more closely scrutinized and minimized. More invasive research methods would be limited or minimized. Additionally, wilderness areas are protected from roads, facilities, recreational

“improvements,” commercial enterprises, and—to varying degrees—helicopters and installations. These provisions would enhance wilderness values and people’s experiences in the area. These effects would likely be moderate, long-term, WSA-wide, and positive.

Wild and Scenic Rivers – Implementing interim management prescriptions would have no effect on wilderness values. However, designation would result in minor to moderate, long-term, local, and positive effects because Wild and Scenic Rivers Act protections are additive to wilderness designations. Wild rivers in wilderness would have the highest level of protection in the Refuge. In addition, the Refuge would have the ability to limit and control public use by establishing user capacities, which, in turn, would enhance wilderness values. The effects would be minor to moderate, long-term, local, and positive.

Kongakut River – Improved monitoring of visitor experiences would: 1) tie observed conditions to management goals for biophysical resources; 2) help identify thresholds of acceptable changes in the biophysical environment; and 3) provide input on actions that could be taken to prevent negative wilderness character indicator thresholds from being reached. The effects would be moderate, long-term, local, and positive.

Visitors seeking solitude and other values associated with wilderness have likely been displaced from the Kongakut. Because outreach education efforts aren’t enforceable, displacement will probably continue to occur. The effects are likely to be minor, long-term, local, and negative.

Rehabilitating impacted sites could help restore the river to its natural condition, thus improving wilderness value. The effects are likely to be minor, long-term, local, and positive.

Special Designations

Wilderness – There would be negligible to minor, long-term, WSA-wide, and positive effects for the Ivishak, and Wind Rivers, as they are entirely in the Brooks Range WSA. Designated wilderness would provide additional protections.

Wild and Scenic Rivers – The Shublik Springs Research Natural Area is downstream from the Marsh Fork Canning River. There would be negligible to minor, long-term, local, and positive effects for Shublik Springs if the Marsh Fork is designated as a wild river; the Marsh Fork would have added resource protections, and visitor experiences would be expected to improve.

Kongakut River – There could be indirect, negligible, long-term, local, and positive effects to the MPA as a result of more proactive management of the Kongakut River.

Public Health and Safety

Wilderness – Wilderness designation would not have an impact on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Wild and Scenic Rivers – Implementing interim management prescriptions or wild river designation would have no effect on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Kongakut River - Educational outreach would have a negligible effect on reducing public health risk created by the accumulation of human waste. Although actions taken in a step-down plan might address human waste and could mitigate associated public health and safety issues, the effects of Alternative B on public health and safety are likely to be minor, long-term, local, and negative.

Refuge Operations

Wilderness – Designating the Brooks Range WSA as wilderness would have effects on overall Refuge operations. Wilderness designation would result in the need to conduct an MRA for all management and research activities. There would be negligible to minor, negative, long-term effects in the WSA if such designation limited the ability to conduct research or monitoring necessary to develop effective conservation measures.

Currently, DOI and Service policies require an MRA and ANILCA Section 810 analysis for all special use permits (commercial service providers, biological and cultural research and monitoring, access, etc.) and for any new administrative activity in designated wilderness. Many activities are prohibited or highly regulated in designated wilderness but can occur on lands managed under the Refuge's Minimal Management category with less regulation. If the Brooks Range WSA is designated as wilderness, requested activities would be required to go through a more rigorous process. For example, the ability to manage visitor use by monitoring with remote sensing technology could be impacted by limitations placed on installations in wilderness. Depending on the activity, NEPA processes and the involvement of experts outside the Refuge staff could be required before making a decision on the proposed activity. New wilderness designation could increase the paperwork burden for all permit applicants and the Refuge staff. These effects would likely be minor to moderate, long-term, WSA-wide, and negative.

Additionally, some research that is currently occurring or authorized in the Brooks Range WSA could become highly regulated and possibly not allowed. If a proposed activity is not necessary to manage the lands as wilderness, then the activity would not be allowed. For example, climate change research and installations (such as weather stations, soil temperature gauges, stream gauges, etc.) not directly associated with the management of wilderness lands might not be employed to gather data in wilderness. This could limit climate change data gathering capabilities in the Refuge and possibly in the region. These effects would likely be minor to moderate, long-term, WSA-wide, and negative.

Wild and Scenic Rivers – There would be no effect to Refuge operations under interim management prescriptions. For designation, there would be effects to Refuge operations. There would be an additional workload for preparing a CRMP in the short term; the effects would be moderate to major, short-term, Refuge-wide, and negative. In the longer term, monitoring and the potential for adjusting user limits would result in moderate, long-term, Refuge-wide, and negative effects. However, once the CRMPs are completed and monitoring protocols and a system for managing the rivers are in place, there should be less strain on Refuge staff dealing with day-to-day issues.

Kongakut River – This alternative would require additional staff time and budget to 1) execute a monitoring program; 2) develop educational outreach materials; 3) compile and publish schedules of proposed launch dates; 4) conduct site-specific rehabilitation; and 5)

develop and execute a step-down management plan. The effects are likely to be moderate, long-term, Refuge-wide, and negative.

5.4.3 Cumulative Effects of Alternative B

The Brooks Range WSA (5.4 million acres) would be recommended for designation as wilderness. While the cumulative effects for designation would be minor to moderate, it does provide a more permanent statutory protection to the biophysical and human environments. Wilderness would be subject to MRA. No additional wilderness designation in the Coastal Plain could allow for the 1002 Area to more easily be opened by Congress to oil and gas. Lands outside designated wilderness are administered as Minimal Management.

Three rivers would be recommended for wild river designation: the Kongakut, Marsh Fork Canning, and the Hulahula. As such, there would be the cumulative effect of these rivers being afforded the protections of the Wild and Scenic Rivers Act, as well as permanent management prescriptions, particularly the ability to limit and control visitor use. The cumulative effects of these actions would present minor to moderate effects to the biophysical and human environments.

Cumulative effects as a result of management actions for the Kongakut river under this alternative would be minor as a result of increasing education and outreach and more proactively managing the area.

As visitor use increases, there is the potential for some minor cumulative effects to the biophysical and human environments, particularly the visitor experience. In addition, there would be an increased workload and funding requirements as a result of implementing this alternative. There would be a minor to moderate cumulative effect on Refuge operations.

These effects would be cumulative to the effects of climate change, development activities, and management decisions made by others throughout the region.

5.5 Effects of Alternative C

This section evaluates the implication or impacts on resources categories in each major issue: wilderness, wild and scenic rivers, and the Kongakut River.

Introduction

Wilderness – Alternative C recommends the Coastal Plain Wilderness Study Area (1.4 million acres) for wilderness designation. If approved by Congress, this would put all of the Coastal Plain in the Refuge under wilderness management, replacing the existing Minimal Management category. Management strategies are similar for Wilderness and Minimal Management, but Wilderness is a statutory designation that represents a permanent commitment to maintain natural conditions. Whereas the Minimal Management category can be changed through a public process initiated by the Service, changes in wilderness designation are exceedingly rare and require an act of Congress. In addition, the likelihood of opening the 1002 Area to oil and gas exploration would be substantially reduced.

Wild and Scenic Rivers – Alternative C recommends Wild and Scenic Rivers Act protections for an 11-mile segment of the Atigun River, originating at the Refuge’s westernmost boundary and extending to the river’s confluence with the Sagavirnirktok River. No other portions of the Atigun River were studied during the Wild and Scenic River Review. River segments recommended for wild and scenic river status must be protected through interim management prescriptions until Congress acts to designate the river or reject the designation. However, those portions of the river not studied would continue to be managed according to its underlying management category (Minimal Management) and general protections afforded rivers with Refuge status.

The suitability study preliminarily determined that three additional Refuge rivers are suitable for wild river designation: Marsh Fork Canning, Hulahula, and Kongakut. The effects described here are specific to recommending the Atigun River, but even without a recommendation for designation, the ORVs for all four suitable rivers still need to be protected; interim management prescriptions would be implemented indefinitely for the Hulahula, Marsh Fork, and Kongakut Rivers and until congressional action for the Atigun.

Kongakut River – Alternative C proposes that Kongakut River management issues be addressed in a Visitor Use Management and/or Wilderness Stewardship step-down plan. It would also establish several new programs to protect resources in the Kongakut River Valley. The Service would develop educational materials for the public with targeted messages explaining preferred visitor practices and strategies for minimizing impacts, such as proper waste disposal, avoiding wildlife impacts, and alleviating crowding among groups. The Service would provide the public with schedules of proposed guided trip launch dates and past visitor use activity patterns. Rehabilitation of heavily impacted sites would be conducted when necessary. The Service would revise their current river monitoring program of physical and social conditions to evaluate the effectiveness of management actions.

5.5.1 Impacts to the Biophysical Environment from Alternative C

Wilderness – With wilderness designation, restrictions on activities that could damage Refuge resources are less likely to change over time and are more likely to be enforced, providing

greater certainty of long-term protection for wildlife and habitats. Administrative activities in wilderness must be found to be the minimum requirements for the administration of the area as wilderness (see Chapter 2, Section 2.3.4). This is interpreted to include collection of data required for conservation of fish, wildlife, and habitats in the designated area. Wilderness designation would preclude some technologies and installations associated with biophysical research and monitoring. It would also preclude some studies aimed at understanding changes over broader spatial scales, such as those resulting from climate change, that may not have direct applicability to management of the wilderness area itself.

Wild and Scenic Rivers – If the 11-mile segment of the Atigun River recommended under Alternative C is designated as a wild river by Congress, the Refuge would have four river corridors under the Wild River Management category (see Chapter 2, Section 2.3.5).

Kongakut River – While the Kongakut River would not be recommended for wild river status under Alternative C, it would still be managed according to interim management prescriptions for suitable rivers, and it would be accorded the protections of being in designated wilderness. Additionally, the Refuge would implement management tools to address resource concerns in the Kongakut River Valley.

Permafrost and Soils

Wilderness – Alternative C recommends additional portions of the Refuge for wilderness designation. If Congress were to designate the Coastal Plain WSA as wilderness, it would shift from the existing Minimal Management category to Wilderness Management (see Chapter 2, Sections 2.3.3 and 2.3.4). Management strategies are similar for Wilderness and Minimal Management, but wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have minor, long-term, WSA-wide, and positive effects because of the additional statutory restrictions in managing wilderness.

Temporary facilities could damage soils and permafrost, and temporary facilities may be authorized in designated wilderness. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to thawing of buried ice and permafrost. They could have site-specific, moderate, medium-term, and negative effects.

Wild and Scenic Rivers – Interim management prescriptions would be implemented for three of the Refuge's suitable rivers, resulting in negligible, long-term, local, and positive impacts to permafrost and soils in river corridors. Under Alternative C, only the Atigun River would be recommended for wild river designation. If Congress were to designate the Atigun, a CRMP would be prepared, resulting in minor, long-term, local, and positive effects. However, visitor use might still damage soils and permafrost, for example, along the riverbank, where informal trails form seasonally due to heavy foot traffic and at put-in locations; effects would be minor, medium- to short-term, site-specific, and negative.

Kongakut River – Refuge visitors have the potential to damage soils and permafrost by trampling, particularly at campsites and access points such as landing areas. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to melting of buried ice and permafrost. Enhanced management of visitor use in the Kongakut River area under Alternative C would decrease site-specific impacts to permafrost and soils. Site-specific disturbances from visitors occur extensively up and down the Kongakut River corridor, so

enhanced management would also decrease impacts at the local scale. This alternative would have minor to moderate, long-term, local, positive impacts on permafrost and soils in the Kongakut River corridor.

Water Quality and Aquatic Habitats

Wilderness – Wilderness designation would provide a high level of long-term protection for aquatic habitats. Wilderness designation of the Coastal Plain WSA would result in minor, long-term, WSA-wide, and positive effects.

Wild and Scenic Rivers – Interim management prescriptions would be implemented for three of the Refuge's rivers that are suitable but not recommended, resulting in negligible, long-term, local, and positive impacts to water quality and aquatic habitats in river corridors. The Atigun River would be recommended for designation as a wild river. If Congress were to designate the Atigun, a CRMP would be prepared and implemented, resulting in minor, long-term, local, and positive effects.

Kongakut River - Limiting user group sizes can have minor, long-term, local, and positive effects on water quality and aquatic habitats by minimizing disturbance. Educational outreach about proper waste disposal and minimizing other visitor impacts, along with monitoring management actions for effectiveness, would have minor, long-term, local, and positive effects on water quality and aquatic habitats in the Kongakut River basin. Water quality and aquatic habitats can be affected by increased visitor use through increased vegetation trampling and soil compaction, which increases the potential for runoff and sediment loading.

Vegetation and Terrestrial Habitats

Wilderness – Alternative C would recommend the Coastal Plain WSA for wilderness designation. If Congress were to designate this area, the Refuge would change its management from Minimal to Wilderness (see Chapter 2, Sections 2.3.3 and 2.3.4). Although management strategies are similar for Wilderness and Minimal Management, wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have a minor, long-term, WSA-wide, and positive effect because it provides additional restrictions in managing wilderness.

Temporary structures may be authorized in wilderness. They could have moderate, medium-term, site-specific, and negative effects on vegetation and terrestrial habitats.

Wild and Scenic Rivers – Interim management prescriptions would be implemented for three of the Refuge's rivers preliminarily determined suitable for wild river designation. This would result in negligible, long-term, local, and positive impacts to vegetation and terrestrial habitats in river corridors. If Congress were to designate the Atigun River, a CRMP would be prepared and implemented, resulting in minor, long-term, local, and positive effects. Visitor use might still damage vegetation and terrestrial habitats along the riverbank, where informal trails form seasonally due to heavy foot traffic and at put-in locations, and these effects could be minor, short- to medium-term, site-specific, and negative.

Kongakut River – Refuge visitors may damage vegetation and habitats, particularly at campsites and access points such as landing areas. Potential damage includes direct effects of trampling on vegetation; indirect effects of soil and snow compaction as a result of trampling;

breakage of trees and shrubs; possible introduction of invasive plants; and exclusion of wildlife from riparian and adjacent habitats. Most disturbances to vegetation are site-specific and restricted to areas receiving repeated use, such as hunting camps near fixed-wing aircraft-accessible sites and campsites used by floaters. These areas are presently monitored and assessed for negative impacts. Disturbances are local in scale because site-specific disturbances occur extensively along the Kongakut River corridor. Implementation of Alternative C would decrease site-specific impacts to vegetation and habitats and result in minor to moderate, long-term, local, and positive effects.

Fish Populations and Natural Diversity

Wilderness – Many rivers and streams occur in the Coastal Plain WSA. While this WSA is smaller than the others, the concentration of fish populations and natural diversity are highest. Wilderness designation would provide more permanent and stringent protections for fish habitat than current Minimal Management. Effects of designation of the Coastal Plain WSA on fish populations resulting from enhanced habitat protections would be minor, long-term, WSA-wide, and positive.

Wild and Scenic Rivers – Interim management prescriptions would be implemented for three of the Refuge's rivers preliminarily determined suitable for wild river designation but not recommended. These prescriptions would result in negligible, long-term, local, and positive impacts to fish populations and natural diversity. If Congress were to designate the Atigun River, a CRMP would be prepared and implemented, resulting in minor, long-term, local, and positive effects.

Kongakut River – Dolly Varden and grayling are popular fish for anglers on the Kongakut River. Harvest of these fish species is unknown and thought to be low, and negligible, long-term, local, and positive effects would result from developing educational materials on proper catch-and-release techniques. This could in turn lead to increased survival rates of released fishes.

Bird Populations and Natural Diversity

Wilderness – Alternative C would recommend the addition of the Coastal Plain WSA as designated wilderness. If Congress were to designate the area, the Refuge would replace the existing Minimal Management category with Wilderness Management (see Chapter 2, Sections 2.3.3 and 2.3.4). While this WSA is smaller than the others, the concentration of bird populations and natural diversity are highest. Wilderness designation is a more permanent commitment to maintain natural conditions than Minimal Management. Maintaining these natural conditions would have positive effects on bird populations in the WSA. Because most bird species are migratory, beneficial effects could be expressed over a larger area than the Coastal Plain WSA. Under current management, disturbance to birds and alteration of their habitats is minimal. However, wilderness designation, because of its greater long-term commitment to maintaining natural conditions, would have minor to major, long-term, regional or greater, and positive effects on bird populations and natural diversity.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on bird populations and natural diversity under this alternative. Riparian areas tend to have higher density and diversity of birds compared to surrounding habitats.



Kongakut River – Increased management of human use of the Kongakut River Valley would have negligible to minor, site-specific, and positive effects on bird populations. Monitoring impacts to habitats by visitors could lead to the development of conservation measures to mitigate visitor impacts on birds. Educational materials would benefit birds by helping visitors reduce disturbance to nesting raptors and other species, and minimize impacts to bird habitats.

Mammal Populations and Natural Diversity

Wilderness – Alternative C would recommend the addition of the Coastal Plain WSA as designated wilderness. If Congress were to designate this area, the Refuge would replace the area's existing Minimal Management with Wilderness Management (see Chapter 2, Sections 2.3.3 and 2.3.4). Wilderness designation is a more permanent commitment to maintain natural conditions than Minimal Management. Maintaining these natural conditions would have positive effects on mammal populations and natural diversity in the WSA, including caribou, muskoxen, polar bears, and microtines that use the Coastal Plain seasonally or year round. Positive effects would vary from minor to major, long-term, WSA-wide to regional, and positive.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on mammal populations and natural diversity under this alternative.

Kongakut River – Increased management of human use of the Kongakut River Valley would have negligible to minor, long-term, site-specific, and positive effects on mammal populations and natural diversity. Monitoring impacts to habitats by visitors would lead to development of conservations measures to mitigate visitor impacts on mammals. Educational materials would benefit mammals by helping visitors reduce disturbance to resident and migratory species, and minimize impacts to mammal habitats.

5.5.2 Impacts to the Human Environment from Alternative C

Wilderness – Approximately 9,978 acres of Refuge waters in the vicinity of the village of Kaktovik have been determined not qualified for wilderness due to their close proximity to an active community with its airport, generator complex, daily use areas, and sights and sounds of the community. An additional 19,183 acres of lagoon waters near Kaktovik have been determined non-suitable for wilderness designation because of challenges associated with managing these acres as wilderness. In determining manageability, the Service considers factors such as land status and Service jurisdiction, existing inholdings and private rights, Refuge management activities, and public uses. This area is non-suitable because it is a high use area for Kaktovik residents, sees frequent use of motorized vehicles and boats, and has numerous private inholdings.

The Coastal Plain Wilderness Study Area (WSA) is currently managed under Minimal Management. Additionally, ANILCA Section 1004 requires that the area be administered to retain its wilderness character and potential for inclusion in the NWPS unless Congress determines otherwise. Under current management, public use of the Refuge is managed similarly in wilderness and non-wilderness. Most restrictions on public use are derived from the area's status as a refuge and its regulations (e.g., Refuge Administration Act, Refuge Improvement Act, ANILCA, etc.) or are enacted by State laws (e.g., ADFG hunting regulations, Alaska Statute 19.40.210 prohibition of off-road vehicles from the Dalton Highway).

Wild and Scenic Rivers – Alternative C would recommend the Atigun River as a wild river. Additionally, interim management prescriptions would be applied indefinitely to the Marsh Fork Canning, Hulahula, and Kongakut Rivers to retain their ORVs. If Congress were to designate the Atigun River, a CRMP would be developed for the continued protection of the river.

Kongakut River – Under this alternative, there would continue to be an unlimited number of commercial operators offering trips on the Kongakut River. Guides and air-taxis would continue to have Kongakut River specific permit conditions, and guides would continue to be restricted to one guided trip on a river or water body at any given time. Visitor use monitoring of physical impacts and enforcement concerns would continue to occur occasionally. Management would be more proactive than hands-off with a revision of the current monitoring program, public awareness, publishing launch schedules, and rehabilitating selected impacted areas. This alternative proposes to use a Refuge-wide step-down management plan to address specific areas of concern and management strategies. Because this step-down plan has not been developed concurrently with the Revised Plan, the effects of this component of the alternative have not been analyzed.

Local Economy and Commercial Uses

Wilderness – Designation of the Coastal Plain WSA as wilderness would likely result in minor to moderate, long-term, WSA-wide, and negative effects on commercial uses. In designated wilderness, the Wilderness Act of 1964 and Service wilderness policy prohibit commercial enterprises with few exceptions. Visitor services that help people access the Refuge, such as guides and transportation companies, are allowed. Commercial filming is only allowed according to policy. Designation would provide more wilderness for exploration and could potentially attract more visitors to the area, resulting in increased business prospects for recreation guides, air operators, and service providers in local communities. Big-game hunting guides in guide use

areas ARC 01 and ARC 02 could have to comply with stricter guidelines (i.e., no base camps, no airplanes in camp, perhaps limits to the amount of flight time, etc.).

Wilderness designation of the Coastal Plain WSA could have a major, long-term, regional or greater, and negative effect on economic development by restricting potential for oil and gas exploration, leasing, and development of the 1002 Area.

Wild and Scenic Rivers – There would be no to negligible, short-term to long-term, local, and negative effects to the local economy and commercial uses based on proactively managing those rivers according to interim management prescriptions.

There would be minor to moderate, long-term, local, and negative effects on the local economy and commercial uses as a result of implementing the CRMP. With designation, there is authority to limit and control public use if necessary to maintain a river's ORVs, thereby affecting the local economy and commercial use providers.

Kongakut River – A step-down plan would likely have effects on the local economy and commercial uses. Step-down planning would be done in conjunction with key stakeholders and the public. The effects are likely to be moderate, long-term, local, and positive.

Cultural Resources

Wilderness – Potential wilderness designation could have a minor, long-term, WSA-wide, and positive effect on cultural resources. Wilderness areas would restrict potential facilities and recreational “improvements,” most commercial enterprises, and helicopters and installations, to varying degrees. Wilderness designation could provide further long-term protection for cultural resources and traditional lands, waters, and resources used by local residents and serve to perpetuate the natural conditions in which their cultures evolved. People using wilderness for a variety of purposes could cause damage to sites (intentionally or unintentionally). There is also the potential to lose some sites to natural forces such as erosion. Effects would range from minor to major, long-term, site-specific, and negative.

Wild and Scenic Rivers – Cultural resources on the North Slope are on or near the surface of the tundra and tend to be oriented along river corridors. Impacts could occur from people using Refuge lands and waters for a variety of purposes, which could cause damage to cultural resources or sites (both intentionally and unintentionally). The effects would range from minor to major, long-term, site-specific, and positive or negative. Interim management prescriptions to protect rivers found to have cultural values would mitigate these effects. The Hulahula River has a Cultural ORV, and the Refuge would have to provide a higher level of protection for cultural resources along this river. Designation of the Atigun River as a wild river would result in minor to moderate, long-term, local, and negative or positive effects.

Kongakut River – Education and outreach emphasizing stewardship of cultural resources in the Kongakut River drainage would likely minimize potential impacts. Cultural resources would continue to be protected and managed in accordance with Federal and State laws. Visitors to the Kongakut could cause damage to sites (intentionally or unintentionally), and some sites or resources may be lost to natural forces. The overall impact on cultural resources would be consistent with the past. The effects range from minor to major, long-term, site-specific, and negative or positive.

Subsistence

Wilderness – Designation of the Coastal Plain WSA could provide another level of long-term protection to habitats and natural conditions, especially those found near Kaktovik, and serve to perpetuate the subsistence resources Kaktovik residents are dependent upon. Designation might also limit potential encroachment from development. Designation would not restrict subsistence users from utilizing resources in the Refuge, and the right of subsistence users to conduct traditional activities using traditional modes of transportation would continue. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Designation could increase visitor use near Kaktovik's traditional and subsistence use areas, which could increase conflicts between locals and visitors. In general, subsistence uses in wilderness would continue as they have under Minimal Management, and the harvest of subsistence resources would continue. These impacts would likely be minor, long-term, local, and positive.

Wild and Scenic Rivers – Under this alternative, interim management prescriptions combined with educational outreach regarding cultural and subsistence use could improve understanding, and reduce real and/or perceived conflict between local users and non-local visitors. The effects are likely to be minor, long-term, local, and positive. Designation of the Atigun River would result in minor, long-term, local, and negative or positive effects because it could limit or control public use, ensuring fewer conflicts between subsistence and public use.

Kongakut River – Educational outreach regarding cultural and subsistence use in the Kongakut River drainage could improve understanding, and reduce real and/or perceived conflict between local users and nonlocal visitors. The effects are likely to be minor, long-term, local, and positive.

Visitor Services and Recreation Opportunities

Wilderness – Designation of the Coastal Plain WSA as wilderness could have effects on visitor services and recreational opportunities. Designation of more wilderness could positively affect recreational opportunities for solitude, exploration, and freedom. All activities, including commercial services, biological and cultural research and monitoring, and access, would have more restrictions in newly designated wilderness. These impacts are likely to be moderate to major in scale, long-term, WSA-wide, and positive.

Wild and Scenic Rivers – Interim management prescriptions would have no effect on visitor services and recreation. However, newly designated wild rivers could attract more visitors. If the number of visitors exceeds the determined user capacity of a specific river corridor, the Refuge might need to limit use. Effects would likely be minor to moderate, long-term, local, and positive or negative. Visitor experience could be enhanced by limiting use; however, those not able to experience the river could be frustrated by the lack of river access. Any limitations on use of designated rivers could potentially displace visitors to other Refuge rivers.

Kongakut River – This alternative proposes to adopt management strategies based on a Refuge-wide step-down plan. The benefit of this would be that use and issues on the Kongakut may not be displaced to other areas of the Refuge. The drawback would be that the Kongakut experiences issues specific to its corridor, and these issues may not receive adequate attention under a Refuge-wide plan. However, as the step-down plan unfolds, it is likely to have impacts on visitor services and recreational opportunities. The effects are likely to be minor to moderate, long-term, local, and positive or negative.

The other components of this alternative would also have effects on visitor services and recreation opportunities. Developing educational outreach materials with preferred practices and strategies for minimizing impacts would likely raise the level of awareness of commercial and private users. In turn, this could lead to higher quality experiences for all users by reducing the amount of physical and experiential impacts occurring on the river. However, none of these messages would be regulations; therefore, they would not be enforceable. Educational outreach may not be a strong enough tool to produce the desired effects. The effects are likely to be minor to moderate, long-term, local, and positive.

Improving monitoring programs for physical and social conditions could better inform management of areas of concern, thus allowing management to take appropriate, responsive action before continued degradation occurs. However, conducting site-specific monitoring and rehabilitation means Refuge staff could contribute to crowding, adding to cumulative negative impacts. The effects are likely to be minor, long-term, local, and positive or negative.

Publishing schedules of past guided and non-guided visitor use (available from commercial permit client use reports) would likely do little to redistribute use across the season. Demand is driven by two temporally discrete events – caribou migration and the Dall’s sheep hunting season – and concentration of use is compounded by the fact that water levels are better for floating during these times. Effects would be minor, long-term, local, and positive.

Wilderness Values

Wilderness – Designating additional wilderness would have a positive effect on wilderness values. An MRA would be required on all new activities, and helicopter access would be more closely scrutinized and minimized. More invasive research methods would be limited or minimized. Additionally, wilderness areas are protected from roads, facilities, recreational “improvements,” commercial enterprises, and—to varying degrees—helicopters and installations. These provisions would enhance wilderness values and people’s experiences in the area. These effects would likely be moderate, long-term, WSA-wide, and positive.

Wild and Scenic Rivers – Interim management prescriptions would have no effect on wilderness values. However, designation would result in minor to moderate, long-term, local, and positive effects because Wild and Scenic Rivers Act protections are additive to wilderness designations. Wild rivers in wilderness would have the highest level of protection in the Refuge. In addition, wild river designation provides the ability to limit and control public use, which could enhance wilderness values. The effects would be minor to moderate, long-term, local, and positive.

Kongakut River – Improved monitoring of visitor experiences would: 1) tie observed conditions to management goals for biophysical resources; 2) help identify thresholds of acceptable changes in the biophysical environment; and 3) provide input on actions that could be taken to prevent negative wilderness character indicator thresholds from being reached. The effects would be moderate, long-term, local, and positive.

Visitors seeking solitude and other values associated with wilderness have likely been displaced from the Kongakut. Because outreach education efforts are not enforceable, displacement will probably continue to occur. The effects are likely to be minor, long-term, local, and negative. Rehabilitating impacted sites could help restore the river to its natural condition, thus improving wilderness value. The effects are likely to be minor, long-term, local, and positive.

Special Designations

Wilderness – Designation of the Coastal Plain WSA would have minor, long-term, WSA-wide, and positive effects on those portions of the MPA in the WSA. If designated, additional protections would be provided to the MPA.

Wild and Scenic Rivers – There would be no effects to any special designations under this alternative.

Kongakut River – There would be negligible, long-term, local, and positive effects to the MPA as a result of more proactive management of the Kongakut River.

Public Health and Safety

Wilderness – Wilderness designation would not have an impact on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Wild and Scenic Rivers – There would be no effect on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Kongakut – Educational outreach would have a negligible effect on reducing public health risk created by the accumulation of human waste. However, the step-down plan might address human waste and could mitigate associated public health and safety issues. The effects are likely to be minor, long-term, local, and negative.

Refuge Operations

Wilderness – Designating additional Refuge lands as wilderness would have effects on overall Refuge operations. Wilderness designation would result in the need to conduct an MRA for all administrative actions, including management and research activities. There would be negligible to minor, negative, and long-term effects in the WSA if such designation limited the ability to conduct research or monitoring necessary to develop effective conservation measures.

Currently, DOI and Service policies require an MRA and ANILCA Section 810 analysis for all special use permits (commercial service providers, biological and cultural research and monitoring, access, etc.) and for any new administrative activity in designated wilderness. Many activities are prohibited or highly regulated in designated wilderness but can occur on lands managed under the Refuge's Minimal Management category with less regulation. If the Brooks Range WSA is designated as wilderness, requested activities would be required to go through a more rigorous process. For example, the ability to manage visitor use by monitoring with remote sensing technology could be impacted by limitations placed on installations in wilderness.

Depending on the activity, NEPA processes and the involvement of experts outside the Refuge staff could be required before making a decision on the proposed activity. New wilderness designation could increase the paperwork burden for all permit applicants and the Refuge staff. These effects would likely be minor to moderate, long-term, WSA-wide, and negative.

Additionally, some research that is currently occurring or authorized in the Coastal Plain WSA could become highly regulated and possibly not allowed. If a proposed activity is not necessary to manage the lands as wilderness, then the activity would not be allowed. For example, climate change research and installations (such as weather stations, soil temperature gauges, stream gauges, etc.) not directly associated with the management of wilderness lands might not be employed to gather data inside wilderness. This could limit climate change data gathering capabilities in the Refuge and possibly in the region. These effects would likely be moderate, long-term, WSA-wide, and negative.

Wild and Scenic Rivers – There would be no effect to Refuge operations under interim management prescriptions. If the Atigun River is designated, Refuge operations would be affected. There would be an additional workload to prepare a CRMP, and the effects would be moderate to major, short-term, Refuge-wide, and negative. In the longer term, monitoring and the potential for adjusting user limits would result in moderate, long-term, Refuge-wide, and negative effects. However, once the CRMP is completed and monitoring protocols and a system for managing the rivers are in place, there should be less strain on Refuge staff dealing with day-to-day issues.

Kongakut River – This alternative would require additional staff time and budget to 1) execute a monitoring program; 2) develop educational outreach materials; 3) compile and publish schedules of proposed launch dates; 4) conduct site-specific rehabilitation; and 5) develop and execute a step-down management plan. The effects are likely to be moderate, long-term, Refuge-wide, and negative.

5.5.3 Cumulative Effects of Alternative C

Under this alternative, the Coastal Plain WSA (1.4 million acres) would be recommended for wilderness designation, which would provide a more permanent statutory protection to the Refuge's most controversial area. Oil and gas development would likely be prohibited in the foreseeable future. The cumulative effects would be major to the biophysical and human environments.

An 11-mile segment of the Atigun River would be recommended for designation as a wild river. The cumulative effect of this action would be a positive effect for long-term protection of the Atigun River; however, the other three suitable rivers would be managed indefinitely with interim management prescriptions instead of the comprehensive management plan afforded the 11-mile segment of the Atigun River. This would result in a minor cumulative effect to the biophysical and human environments for the foreseeable future.

Cumulative effects as a result of management actions for the Kongakut River under this alternative would be minor as a result of increasing education and outreach and more proactively managing the area. As visitor use increases, there is the potential for some minor cumulative effects to the biophysical and human environments, particularly the visitor experience. In addition, there would be an increased workload and funding requirements as a result of implementing this alternative. There would be a minor to moderate cumulative effect on Refuge operations. These effects would be cumulative to the effects of climate change, development activities, and management decisions made by others throughout the region.

5.6 Effects of Alternative D

This section evaluates the implication or impacts on resources categories in each major issue: wilderness, wild and scenic rivers, and the Kongakut River.

Introduction

Wilderness – Alternative D recommends designating the Brooks Range WSA (5.4 million acre) and Porcupine Plateau WSA (4.4 million acres) for wilderness designation. If Congress were to approve the recommendation, all of the Refuge would be managed under the Wilderness Management category with the exception of the Coastal Plain WSA (1002 Area) and areas near Arctic Village, which would continue to be managed under the Minimal Management category. The Brooks Range and Porcupine Plateau WSAs are currently designated as Minimal Management. Management strategies are similar for Wilderness and Minimal Management, but wilderness is a statutory designation that represents a permanent commitment to maintain natural conditions. While Minimal Management can be changed through a public process initiated by the Service, changes in wilderness designation are exceedingly rare and require an act of Congress.

No additional wilderness designation in the Coastal Plain could allow for the 1002 Area to more easily be opened by Congress to oil and gas.

Wild and Scenic Rivers – Alternative D recommends all four suitable rivers for inclusion in the National Wild and Scenic River System: Atigun, Marsh Fork Canning, Kongakut, and Hulahula Rivers. The Hulahula River would be segmented at the boundary of Refuge and Kaktovik Iñupiat Corporation (KIC) lands. Those portions of the Hulahula River on KIC lands would not be recommended.

Wild and Scenic Rivers Act protections to river corridors are additive to wilderness designations; therefore, recommended rivers in designated wilderness, such as the Kongakut River, would have the highest level of protection in the Refuge. Additional protections proposed under the Kongakut River issue for this alternative may be redundant with protections required by the act.

The Service is required to manage each recommended river for the ORVs for which the river was found eligible. This would be accomplished through interim management prescriptions until Congress designates the rivers or rejects their designation. If Congress were to designate any of the rivers, CRMPs would be developed for the continued protection of the rivers and their ORVs.

The effects described here are specific to those rivers and river segments recommended for inclusion in the NWSRS in Alternative D.

Kongakut River – Alternative D proposes that Kongakut River management issues be addressed in step-down planning (i.e., Visitor Use Management Plan and Wilderness Stewardship Plan). It would also establish several new programs to protect resources in the Kongakut River Valley. The Service would develop educational materials for the public with targeted messages explaining preferred visitor practices and strategies for minimizing impacts, such as proper waste disposal, avoiding wildlife impacts, and alleviating crowding among groups. The Service would provide the public with schedules of proposed guided trip launch dates and past visitor use activity patterns. Rehabilitation of heavily impacted sites

would be conducted when necessary. The Service would revise the current monitoring program of physical and social conditions to evaluate the effectiveness of management actions. Efforts would be increased to enforce compliance of special use permit conditions and existing visitor use regulations. We would work with commercial guides to encourage them to voluntarily modify their use of the river throughout the season, especially during heavy use periods (late June and mid-August). We would also work with commercial air-taxi operators to disperse commuting flight paths in and out of the Kongakut valley, subject to safe aircraft operation, inclement weather conditions, and takeoff and landing approach requirements.

5.6.1 Impacts to the Biophysical Environment from Alternative D

Wilderness – With wilderness designation, restrictions on activities that could damage Refuge resources are less likely to change over time and are more likely to be enforced, providing greater certainty of long-term protection for wildlife and habitats. Administrative activities in wilderness must be found to be the minimum requirements for the administration of the area as wilderness (see Chapter 2, Section 2.3.4). This is interpreted to include collection of data required for conservation of fish, wildlife, and habitats in the designated area. Wilderness designation would preclude some technologies and installations, as well as some studies aimed at understanding changes over broader spatial scales, such as those resulting from climate change, that may not have direct applicability to management of the wilderness area itself.

Wild and Scenic Rivers – Alternative D recommends wild and scenic river designation for all four suitable rivers, but only those portions of the Hulahula River flowing through Refuge lands would be recommended. Rivers recommended for wild river status must be protected until Congress acts to accept or reject the designation. The Service is required to manage each recommended river for the ORV for which it was found eligible. Minimal or Wilderness Management would continue as long as the rivers are under interim management; if designated, management would convert to the Refuge's Wild River Management category.

Kongakut River – Alternative D recommends a suite of management tools to address resource concerns in the Kongakut River Valley. The Kongakut River is also afforded protections from being located in designated wilderness. Additionally, the river has preliminarily been determined suitable for wild river designation, and the Refuge would maintain the river's ORVs by implementing interim management prescriptions.

Permafrost and Soils

Wilderness – Alternative D recommends additional portions of the Refuge for wilderness designation. If Congress were to designate these areas as wilderness, management would convert from the existing Minimal Management category to Wilderness Management. Management strategies are similar for Wilderness and Minimal Management, but wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have a minor, long-term, WSA-wide, and positive effect because it provides additional restrictions in managing wilderness.

Temporary facilities may damage soils and permafrost. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to thawing of buried ice and permafrost. Temporary

structures may be authorized in Minimal and Wilderness Management categories. They could have moderate, site-specific, medium-term, and negative effects.

Wild and Scenic Rivers – Interim management prescriptions would be implemented for the four recommended rivers. These would have negligible, long-term, site-specific, positive effects. If Congress were to designate the recommended rivers, a CRMP would be prepared for each river. The plans would result in minor, long-term, local, and positive effects on permafrost and soils. Visitor use could still damage soils and permafrost along the riverbank where informal trails form seasonally due to heavy foot traffic and at put-in locations.

Kongakut River – Refuge visitors have the potential to damage soils and permafrost by trampling, particularly at campsites and access points such as landing areas. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to melting of buried ice and permafrost. Enhanced management of visitor use in the Kongakut River area under Alternative D would decrease these site-specific impacts. Site-specific disturbances from visitors occur extensively up and down the Kongakut River corridor, so enhanced management would also decrease impacts at the local scale. This alternative would have minor to moderate, long-term, local, and positive impacts on permafrost and soils in the Kongakut River corridor.

Water Quality and Aquatic Habitats

Wilderness – Wilderness designation provides a high level of long-term protection for aquatic habitats. Wilderness designation of the Brooks Range and Porcupine Plateau WSAs would result in minor, long-term, WSA-wide, and positive effects.

Wild and Scenic Rivers – For those rivers designated by congress, CRMPs would be prepared and result in minor, long-term, local, and positive effects.

Kongakut River – Limiting user group sizes can have minor, long-term, local, and positive effects on water quality and aquatic habitats by minimizing disturbance.

Educational outreach about proper waste disposal and minimizing other visitor impacts, along with monitoring management actions for effectiveness and efforts to reduce crowding during heavy use periods, would have minor, long-term, local, and positive effects on water quality and aquatic habitats in the Kongakut River drainage. Water quality and aquatic habitats can be affected by increased visitor use through increased vegetation trampling and soil compaction, which increases the potential for runoff and sediment loading.

Vegetation and Terrestrial Habitats

Wilderness – Alternative D would recommend additional portions of the Refuge for wilderness designation. If designated by Congress, the existing Minimal Management category would be replaced by Wilderness Management. Although management strategies are similar for Wilderness and Minimal Management, wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have a minor, long-term, WSA-wide, and positive effect because it provides additional restrictions in managing wilderness.

Temporary structures may be authorized. They could have moderate, medium-term, site-specific, and negative effects.

Wild and Scenic Rivers – If Congress were to designate the four rivers, CRMPs would be prepared for each river, resulting in minor, long-term, local, and positive effects. Visitor use may damage vegetation and terrestrial habitats along the riverbank where informal trails form seasonally due to heavy foot traffic and at put-in locations.

Kongakut River – Refuge visitors may damage vegetation and habitats, particularly at campsites and access points such as landing areas. Potential damage includes direct effects of trampling on vegetation; indirect effects of soil and snow compaction as a result of trampling; breakage of trees and shrubs; possible introduction of invasive plants; and exclusion of wildlife from riparian and adjacent habitats. Most disturbances to vegetation are site-specific and restricted to areas receiving repeated use, such as hunting camps near fixed-wing aircraft-accessible sites and campsites used by floaters along major rivers. These areas are presently monitored and assessed. Implementing the management strategies of Alternative D would likely have minor to moderate, long-term, local, and positive effects on vegetation and terrestrial habitats in the Kongakut River corridor.

Fish Populations and Natural Diversity

Wilderness – The Brooks Range and Porcupine Plateau Wilderness Study Areas include many fish-bearing rivers and streams. Wilderness designation would provide more permanent and stringent protections for fish habitat than current Minimal Management. Effects of designation of these WSAs on fish populations and natural diversity resulting from enhanced habitat protections would be minor, long-term, throughout the WSAs, and positive.

Wild and Scenic Rivers – If Congress were to designate the recommended rivers, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects.



Kongakut River – Dolly Varden and grayling are popular fish for anglers on the Kongakut River. Harvest of these fish species is unknown and thought to be low, and negligible, long-term, local, positive effects would result from developing educational materials on proper catch-and-release techniques, which could lead to increased survival rates of released fishes. Reducing the number of user groups on the river would also have positive effects by reducing substrate disturbance in and out of the river. This effect would be negligible, long-term, local, and positive.

Bird Populations and Natural Diversity

Wilderness – Maintaining natural conditions would have positive effects on bird populations and natural diversity in the Brooks Range and Porcupine Plateau Wilderness Study Areas. Because most bird species are migratory, beneficial effects could be expressed over a larger area than the WSAs. Under current management, disturbance to birds and alteration of their habitats is minimal. However, wilderness designation, with its long-term commitment to maintaining natural conditions, could have minor, long-term, regional or greater, and positive effects.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on bird populations and natural diversity under this alternative. Riparian areas tend to have higher density and diversity of birds compared to surrounding habitats.

Kongakut River – Enhanced efforts to enforce special use permit conditions, redistribute crowding during peak periods, dispersal of flight paths, targeted education on low-impact recreational use, and enhanced impact monitoring would have minor, site-specific, long-term, positive effects on bird populations and natural diversity in the Kongakut River corridor. Monitoring impacts to habitats by visitors would lead to development of conservation measures to mitigate visitor impacts on birds. Educational materials would benefit birds by helping visitors reduce disturbance to nesting raptors and other species, and minimize impacts to bird habitats. Effects would be minor, long-term, site-specific, and positive.

Mammal Populations and Natural Diversity

Wilderness – Wilderness designation would result in minor to moderate, long-term, WSA-wide to regional, and positive effects for a variety of mammals including Dall's sheep, moose, grizzly bears, black bears, wolves, wolverines, and caribou. Allowed activities are similar under current Minimal management, but wilderness designation is a more permanent and stringent commitment to protect mammal populations and habitats.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on mammal populations and natural diversity under this alternative.

Kongakut River – Enhanced efforts to enforce special use permit conditions, redistributing crowding during peak periods, dispersal of flight paths, targeted education on low-impact recreational use, and enhanced impact monitoring would have minor, long-term site-specific, and positive effects on mammal populations in the Kongakut River corridor. Monitoring impacts to habitats by visitors would lead to development of conservation measures to mitigate visitor impacts on mammals. Educational materials would benefit mammals by helping visitors reduce disturbance to resident and migratory species, and minimize impacts to mammal habitats.

5.6.2 *Impacts to the Human Environment from Alternative D*

Wilderness – The Brooks Range WSA excludes approximately 39,549 acres of Refuge land in the vicinity of Arctic Village and Old John Lake. The area is not qualified for wilderness designation because of its close proximity to an active community with its airport, generator complex, daily use areas, and notable concentrations of private Native allotments. An area of 180,117 acres (inclusive of the non-qualified area) of Refuge land near Arctic Village has been determined to be non-suitable for wilderness designation through an evaluation of manageability. In determining manageability, the Service considers factors such as land status and Service jurisdiction, existing inholdings and private rights, Refuge management activities, and public uses. This area is non-suitable because it is a high use area for Arctic Village residents and the extent of authorized activities such as firewood and house log cutting would make it difficult to manage as wilderness. Motorized activity is frequent in this area, and it contains a large number of inholdings.

The Brooks Range and Porcupine WSAs are currently managed under the Minimal Management category. Under current management, public use of the Refuge is managed similarly in wilderness and non-wilderness. Most restrictions on public use are derived from the area's status as a refuge and its regulations (e.g., Refuge Administration Act, Refuge Improvement Act, ANILCA, etc.) or are enacted by State laws (ADFG hunting regulations, Alaska Statute 19.40.210 prohibition of off-road vehicles from the Dalton Highway).

Wild and Scenic Rivers – Alternative D recommends the Kongakut, Marsh Fork Canning, and Atigun rivers, plus those portions of the Hulahula River managed by the Refuge. Interim management prescriptions will be implemented to maintain the ORVs. If Congress were to designate any of the rivers, CRMPs would be developed for the continued protection of the rivers and their values.

Kongakut River - Under this alternative, there would continue to be an unlimited number of commercial operators offering trips on the Kongakut River. Guides and air-taxis would continue to have Kongakut River specific permit conditions, and guides would continue to be restricted to one guided trip on a river or water body at any given time. Visitor use monitoring of physical impacts and enforcement concerns would continue to occur occasionally. Management would be more proactive than hands-off with a revised monitoring program, public awareness, publishing launch schedules, rehabilitating selected impacted areas, as well as increasing enforcement efforts, redistributing the number of groups on the river, and working with commercial air-taxi operators. This alternative proposes to use a Refuge-wide step-down management plan to address specific areas of concern and management strategies. Because this step-down plan has not been developed concurrently with the Revised Plan, the effects of this component of the alternative have not been analyzed.

Local Economy and Commercial Uses

Wilderness – Designation of the Brooks Range and Porcupine Plateau WSAs as wilderness could have a varied effect on commercial uses. In designated wilderness, the Wilderness Act of 1964 and Service wilderness policy prohibit commercial enterprises with few exceptions. Visitor services that allow people to access the Refuge, such as guides and transportation companies, are allowed. Commercial filming is only allowed according to policy. Designation would provide more wilderness for exploration and could potentially attract more visitors to the area, resulting in increased business prospects for recreation guides, air operators, and

service providers in local communities. Big-game hunting guides in the Brooks Range and Porcupine Plateau WSAs could have to comply with stricter guidelines (i.e., no base camps, no airplanes in camp, perhaps limits to the amount of flight time, etc.). These impacts are likely to be minor to moderate, long-term, specific to the Brooks Range and Porcupine Plateau WSAs, and negative.

Wild and Scenic Rivers – There would be no to negligible, short-term to long-term, local, and negative effects to the local economy and commercial uses based on proactively managing rivers according to interim management prescriptions.

There would be minor to moderate, long-term, local, and negative effects on the local economy and commercial uses as a result of implementing the CRMP. With designation, the Refuge would have the authority to limit and control public use, thereby affecting the local economy and commercial use providers.

Kongakut River – Redistributing the number of commercial trips during peak periods would limit the economic contribution of the river. If the number of trips were limited, some service providers may decide not to offer a trip(s) on the Kongakut. Ultimately, this could limit the number of service providers, including air-taxis. It could also displace use elsewhere on Arctic Refuge. The effects would likely be moderate, long-term, local, and negative.

A step-down plan would likely have effects on the local economy and commercial uses. Step-down planning would be done in conjunction with key stakeholders and the public. The effects would likely be moderate, long-term, local, and positive.

Cultural Resources

Wilderness – Potential wilderness designation could have a minor, long-term, WSA to regional, and positive effect on cultural resources. Wilderness areas would restrict potential facilities and recreational “improvements,” most commercial enterprises, and helicopters and installations, to varying degrees. Wilderness designation could provide further long-term protection for cultural resources and traditional lands, waters, and resources used by local residents and serve to perpetuate the natural conditions in which their cultures evolved.

People using wilderness for a variety of purposes might cause some damage to sites (intentionally or unintentionally), and some sites could be lost to natural forces such as erosion. Effects would range from minor to major, long-term, site-specific, and negative or positive.

Wild and Scenic Rivers – Cultural resources on the North Slope and Coastal Plain are on or near the surface of the tundra and tend to be oriented along river corridors and coastal beaches. Impacts could occur from people using Refuge lands and waters for a variety of purposes, which could cause damage to cultural resources or sites (either intentionally or unintentionally). The effects would range from minor to major, long-term, local, and negative or positive. The Hulahula River has a Cultural ORV, and the Refuge would have to provide a higher level of protection for cultural resources along this river. Designation of the four rivers would result in minor to moderate, long-term, local, and negative or positive effects.

Kongakut River – Education and outreach emphasizing stewardship of cultural resources in the Kongakut River drainage would likely minimize potential impacts. Cultural resources would be protected and managed in accordance with Federal and State laws. Visitors to the Kongakut may cause some damage to sites (intentionally or unintentionally), and some sites or

resources may be lost to natural forces. The overall impact on cultural resources would be consistent with the past. The effects range from minor to major, long-term, site-specific, and negative or positive.

Subsistence

Wilderness – Designation of the Brooks Range and Porcupine Plateau WSAs could provide another level of long-term protection to habitats and natural conditions for areas south of the Brooks Range and serve to perpetuate the subsistence resources so important to local subsistence communities. Designation might also limit potential encroachment from development. Designation would not restrict subsistence users from utilizing resources in the Refuge, and the right of subsistence users to conduct traditional activities using traditional modes of transportation would continue. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Designation could increase visitor use near the south side village traditional and subsistence use areas, which could increase conflicts between locals and visitors. In general, subsistence uses in wilderness would continue as they have under Minimal Management, and the harvest of subsistence resources would continue. These impacts would likely be minor, long-term, local, and positive.

Wild and Scenic Rivers – Under this alternative, interim management prescriptions combined with educational outreach regarding cultural and subsistence use in river drainages could improve understanding and reduce real and/or perceived conflict between local users and non-local visitors. The effects are likely to be minor, long-term, local, and positive. Designation would result in minor to moderate, long-term, local, and negative or positive effects because the Refuge could limit or control public use, ensuring fewer conflicts between subsistence and public use.

Kongakut River – Educational outreach regarding cultural and subsistence use in the Kongakut River drainage could improve understanding and reduce real and/or perceived conflict between local users and non-local visitors. The effects would likely be minor, long-term, local, and positive.

Visitor Services and Recreation Opportunities

Wilderness – Designation of the Brooks Range and Porcupine Plateau WSAs as wilderness could have effects on visitor services and recreational opportunities. Commercial filming is only allowed according to policy. Designation of more wilderness could positively affect recreational opportunities for solitude, exploration, and freedom. All activities, including commercial services, biological and cultural research and monitoring, and access in newly designated wilderness, would be closely scrutinized. There would be more restrictions on intrusive research methods and access. This could positively impact a visitor's Refuge experience. Designation could benefit those visitors who cannot afford the high costs of flying into the remote regions of the Refuge wilderness. Dalton Highway road access to the Brooks Range WSA makes it possible and more economically feasible for visitors to reach designated wilderness without requiring aircraft support. These impacts are likely to be wilderness-wide, long-term, and moderate to major in scale.

To preserve wilderness values, the Refuge may decide to have less law enforcement and staff presence on the ground. Opportunities to visit with either law enforcement or other staff could eliminate potential outreach and education opportunities. These effects would likely be minor, short-term or temporary, site-specific, and negative or positive, depending on the user.

Wild and Scenic Rivers – There would be no effects to visitor services and recreational opportunities by recommending wild rivers or implementing interim management prescriptions. However, newly designated wild rivers could attract more visitors. If the number of visitors exceeds the determined user capacity of a specific river corridor, the Refuge might need to limit use. The effects would likely be minor to moderate, long-term, local, and positive or negative. The visitor experience could be enhanced by limiting use; however, those visitors not be able to experience the river would be frustrated due to lack of river access. Any limitations on use of the designated rivers could potentially displace visitors to other rivers in the Refuge.

Kongakut River – There would be fewer opportunities for visitors to take guided trips on the Kongakut River, and there could be fewer service providers. This might displace use elsewhere on Arctic Refuge; however, displacement would be mitigated by adopting a Refuge-wide step-down plan. This alternative proposes to adopt management strategies based on a Refuge-wide step-down plan. The benefit of this would be that use and issues on the Kongakut might not be displaced to other areas of the Refuge. The drawback would be that the Kongakut experiences issues specific to its corridor, and these issues may not receive adequate attention under a Refuge-wide plan. As the step-down plan unfolds, it is likely to have impacts on visitor services and recreational opportunities. The effects are likely to be minor to moderate, long-term, local, and positive or negative.

The other components of this alternative would also likely have effects. Developing educational outreach materials with preferred practices and strategies for minimizing impacts would likely raise the level of awareness of commercial and private users. In turn, this could lead to higher quality experiences for all users by reducing the amount of physical and experiential impacts occurring on the river. However, none of these messages would be regulations; therefore, they would not be enforceable. Educational outreach may not be a strong enough tool to produce the desired effects. The effects are likely to be minor to moderate, long-term, local, and positive.

Improving monitoring programs for physical and social conditions could better inform management of areas of concern, thus allowing management to take appropriate responsive action before continued degradation occurs. However, conducting site-specific monitoring and rehabilitation means Refuge staff could contribute to crowding and add to cumulative negative impacts. The effects are likely to be minor, long-term, local, and positive or negative.

Publishing schedules of past guided and non-guided visitor use (currently available through commercial permit client use reports) would likely do little to redistribute use across the season, since demand is driven by two temporally discrete events: caribou migration and the Dall's sheep hunting season. This concentration of use is compounded by the fact that water levels are likely to be better for floating during these times. The effects are likely to be minor, long-term, local, and positive.

Wilderness Values

Wilderness – Designating additional wilderness would have a positive effect on wilderness values. MRAs would be required on all new activities, and helicopter access would be more closely scrutinized and minimized. More invasive research methods would be limited or minimized. Additionally, wilderness areas are protected from roads, facilities, recreational “improvements,” commercial enterprises, and—to varying degrees—helicopters and installations. These provisions would enhance wilderness values and people’s experiences in the area. These effects would likely be major, long-term, Refuge-wide, and positive due to the addition of 9.8 million acres of wilderness.

Wild and Scenic Rivers – Implementing interim management prescriptions would have no effect on wilderness values. However, designation would result in minor to moderate, long-term, local, and positive effects because Wild and Scenic Rivers Act protections are additive to wilderness designations. Wild rivers in wilderness would have the highest level of protection in the Refuge. In addition, the Refuge would have the ability to limit and control public use, thereby enhancing wilderness values. The effects would be minor to moderate, long-term, local, and positive.

Kongakut River – Working with operators to disperse flight paths could reduce air traffic, improving the wilderness experience for visitors. Because Arctic Refuge does not have jurisdiction over airspace, compliance with this request could not be enforced. The effects are likely to be moderate, long-term, local, and positive.

Improved monitoring of visitor experiences would: 1) tie observed conditions to management goals for biophysical resources; 2) help identify thresholds of acceptable changes in the biophysical environment; and 3) provide input on actions that could be taken to prevent negative wilderness character indicator thresholds from being reached. The effects would be moderate, long-term, local, and positive.

Visitors seeking solitude and other values associated with wilderness have likely already been displaced from the Kongakut. Due to the lack of enforceability of outreach education efforts, displacement will likely continue to occur. The effects are likely to be minor, long-term, local, and negative.

Rehabilitating impacted sites could help restore the river to its natural condition, thus improving wilderness values. The effects are likely to be minor, long-term, local, and positive.

Special Designations

Wilderness – There would be negligible to minor, long-term, WSA-wide, and positive effects to the Refuge’s existing three wild rivers as a result of wilderness designation. The lower portion of the Sheenjek, Ivishak, and Wind Rivers would receive additional protection from being in designated wilderness.

Wild and Scenic Rivers – The Shublik Springs Research Natural Area is downstream from the Marsh Fork Canning River. There would be negligible to minor, long-term, local, and positive effects for Shublik Springs if the Marsh Fork is designated as a wild river; the Marsh Fork would have added resource protections, and visitor experiences would be expected to improve.

Kongakut River - There would be negligible, long-term, local, and positive effects to the MPA as a result of more proactive management of the Kongakut River.

Public Health and Safety

Wilderness – Wilderness designation would not have an impact on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Wild and Scenic Rivers – There would be no effect on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Kongakut River – This alternative commits to increased enforcement efforts, which would mean enforcement officers would be more likely to be on site in the case of an emergency. The effects are likely to be negligible, long-term, local, and positive.

Refuge Operations

Wilderness – Designating additional Refuge lands as wilderness could have many effects on overall Refuge operations. Although Refuge lands are currently either managed as designated wilderness or Minimal Management, designated wilderness requires more hours to manage.

Currently, DOI and Service policies require an MRA and ANILCA Section 810 analysis for all special use permits (commercial service providers, biological and cultural research and monitoring, access, etc.) and for any new administrative activity in designated wilderness. Many activities are prohibited or highly regulated in designated wilderness but can occur on lands managed under the Refuge's Minimal Management category with less regulation. If the Brooks Range WSA is designated as wilderness, requested activities would be required to go through a more rigorous process. For example, the ability to manage visitor use by monitoring with remote sensing technology could be impacted by limitations placed on installations in wilderness.

Depending on the activity, NEPA processes and the involvement of experts outside the Refuge staff could be required before making a decision on the proposed activity. New wilderness designation could increase the paperwork burden for all permit applicants and the Refuge staff. These effects would likely be minor to moderate, long-term, WSA-wide, and negative.

Additionally, some research that is currently occurring or authorized in the Brooks Range and Porcupine Plateau WSA could become highly regulated and possibly not allowed. If a proposed activity is not necessary to manage the lands as wilderness, then the activity would not be allowed. For example, climate change research and installations (such as weather stations, soil temperature gauges, stream gauges, etc.) not directly associated with the management of wilderness lands might not be employed to gather data in the wilderness. This could limit climate change data gathering capabilities in the Refuge and possibly in the region. These effects would likely be moderate to major, long-term, Refuge-wide, and negative.

Wild and Scenic Rivers – There would be no effect to Refuge operations under interim management prescriptions. If the recommended rivers were designated by Congress, there would be effects to Refuge operations. There would be an additional workload for preparing CRMPs in the short term; the effects would be moderate to major, short-term, Refuge-wide,

and negative. In the longer term, monitoring and the potential for adjusting user limits would result in moderate, long-term, Refuge-wide, and negative effects. Once the CRMP is completed and monitoring protocols and a system for managing the rivers are in place, there should be less strain on Refuge staff dealing with day-to-day issues.

Kongakut River – Increased enforcement efforts would require more staff time and could require hiring another officer. The effects are likely to be minor, long-term, local, and negative. This alternative would require additional staff time and budget to 1) execute a revised monitoring program; 2) develop educational outreach materials; 3) compile and publish schedules of proposed launch dates; 4) conduct site-specific rehabilitation; and 5) develop and execute a step-down management plan. The effects are likely to be moderate, long-term, Refuge-wide, and negative.

5.6.3 Cumulative Impacts of Alternative D

The Brooks Range WSA (5.4 million acres) and Porcupine Plateau WSA (4.4 million acres) would be recommended for designation as wilderness. While the cumulative effects for designation would be minor to moderate, it does provide a more permanent statutory protection to the biophysical and human environments. The cumulative effect of having 17.8 million acres of wilderness managed as part of the Refuge would result in minor to moderate effects. Wilderness would be subject to an MRA. No additional wilderness designation in the Coastal Plain could allow for the 1002 Area to more easily be opened by Congress to oil and gas. Lands outside designated wilderness are administered as Minimal Management.

All four suitable rivers would be recommended for wild and scenic river designation: the Kongakut, Marsh Fork Canning, Hulahula, and Atigun Rivers. As such, there would be the cumulative effect of all these rivers being afforded the protections of the Wild and Scenic Rivers Act, as well as permanent management prescriptions, particularly the ability to limit and control visitor use. The cumulative effects of these actions would present minor to moderate effects to the biophysical and human environments.

Cumulative effects as a result of management actions for the Kongakut River under this alternative would be minor as a result of increasing education and outreach and more proactively managing the area.

As visitor use increases, there is the potential for some minor cumulative effects to the biophysical and human environments, particularly the visitor experience. In addition, there would be increased workload and funding requirements as a result of implementing this alternative. There would be a minor to moderate cumulative effect on Refuge operations.

These effects would be cumulative to the effects of climate change, development activities, and management decisions made by others throughout the region.

5.7 Effects of Alternative E

This section evaluates the implication or impacts on resources categories in each major issue: wilderness, wild and scenic rivers, and the Kongakut River.

Introduction

Wilderness – Approximately eight million acres of designated wilderness would continue to be managed as wilderness. Alternative E recommends all three Wilderness Study Areas (nearly 11.2 million acres) for wilderness designation. If approved by Congress, this would put all of the Refuge under Wilderness Management, with the exception of non-qualified and non-suitable areas around Kaktovik and Arctic Village. Wilderness designation would replace the existing Minimal Management category. Management strategies are similar for Wilderness and Minimal Management, but wilderness is a statutory designation that represents a permanent commitment to maintain natural conditions. Whereas the Minimal Management category can be changed through a public process initiated by the Service, changes in wilderness designation are exceedingly rare and require an act of Congress.

Wild and Scenic Rivers – Alternative E recommends wild river designation for all four of the Refuge's suitable rivers. Rivers recommended for Wild and Scenic River status must be protected until Congress acts to accept or reject the designation. The Refuge is required to manage each recommended river for the ORVs for which it was found eligible. Wild and Scenic Rivers Act protections to river corridors are additive to wilderness designations; therefore, recommended rivers in designated wilderness, such as the Kongakut River, would have the highest level of protection in the Refuge. In the case of the Kongakut River, the additional protections may be redundant with the visitor use management actions proposed in this alternative for the Kongakut River issue.

Kongakut River – Alternative E proposes that Kongakut River management issues be addressed in step-down planning (e.g., Visitor Use Management Plan and Wilderness Stewardship Plan). It would also establish several new programs to protect resources in the Kongakut River Valley. The Service would develop educational materials for the public with targeted messages explaining preferred visitor practices and strategies for minimizing impacts, such as proper waste disposal, avoiding wildlife impacts, and alleviating crowding among groups. The Service would provide the public with schedules of proposed guided trip launch dates and past visitor use activity patterns. Rehabilitation of heavily impacted sites would be conducted when necessary. The Service would revise the current monitoring program of physical and social conditions to evaluate the effectiveness of management actions.

Efforts would be increased to enforce compliance of special use permit conditions and existing visitor use regulations. We would work with commercial guides to encourage them to voluntarily modify their use of the river throughout the season, especially during heavy use periods (late June and mid-August). We would also work with commercial air-taxi operators to disperse commuting flight paths in and out of the Kongakut valley, subject to safe aircraft operation, inclement weather conditions, and takeoff and landing approach requirements.

5.7.1 *Impacts to the Biophysical Environment from Alternative E*

Wilderness – With wilderness designation, restrictions on activities that could damage Refuge resources are less likely to change over time and are more likely to be enforced, providing greater certainty of long-term protection for wildlife and habitats. Administrative activities in wilderness must be found to be the minimum requirements for the administration of the area as wilderness (see Chapter 2, Section 2.3.4). This is interpreted to include collection of data required for conservation of fish, wildlife, and habitats in the designated area. Wilderness designation would preclude some technologies and installations, as well as some studies aimed at understanding changes over broader spatial scales, such as those resulting from climate change, that may not have direct applicability to management of the wilderness area itself.

Wild and Scenic Rivers – Alternative E recommends wild river designation for all four of the Refuge's suitable rivers. Rivers recommended for wild river status must be protected until Congress acts to accept or reject the designation. The Refuge is required to manage each recommended river for the ORVs for which it was found eligible. Positive effects would be site-specific to local in scale and minor to moderate in intensity. Minimal or Wilderness Management of the areas that the recommended rivers flow through would continue unless designated by Congress. If designated, the rivers would convert to Wild River Management.

Kongakut River – Alternative E recommends a suite of management tools to address resource concerns in the Kongakut River Valley. The Kongakut River is also afforded protections from being located in designated wilderness. Additionally, the river has preliminarily been determined suitable for wild river designation, and the Refuge would maintain the river's ORVs by implementing interim management prescriptions.

Permafrost and Soils

Wilderness – Alternative E recommends additional portions of the Refuge for wilderness designation. If designated by Congress, the Refuge would replace the existing Minimal Management category with Wilderness Management. Management strategies are similar for Wilderness and Minimal Management, but wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have a minor, long-term, WSA-wide, and positive effect because it provides additional restrictions in managing wilderness.

Temporary facilities may damage soils and permafrost. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to thawing of buried ice and permafrost. Under Minimal and Wilderness Management, temporary structures may be authorized. They could have site-specific, moderate, medium-term, and negative effects.

Wild and Scenic Rivers – If Congress were to designate the four suitable rivers, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects. Visitor use may damage soils and permafrost along the riverbank, where informal trails form seasonally due to heavy foot traffic and at put-in locations.

Kongakut River – Refuge visitors have the potential to damage soils and permafrost by trampling, particularly at campsites and access points such as landing areas. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of soil, soil erosion, melting of permafrost, and ground subsidence due to melting of buried ice and

permafrost. Enhanced management of visitor use in the Kongakut River area under Alternative E would decrease these site-specific impacts. Site-specific disturbances from visitors occur extensively up and down the Kongakut River corridor, so enhanced management would also decrease impacts at the local scale. This alternative would have minor to moderate, long-term, local, positive impacts on permafrost and soils in the Kongakut River corridor.

Water Quality and Aquatic Habitats

Wilderness – Wilderness designation would provide a high level of long-term protection for aquatic habitats. Wilderness designation of the Brooks Range, Coastal Plain, and Porcupine Plateau WSAs would result in minor, long-term, Refuge-wide, and positive effects.

Wild and Scenic Rivers – If Congress were to designate rivers, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects.

Kongakut River - Limiting user group sizes can have minor, long-term, local, and positive effects on water quality and aquatic habitats by minimizing disturbance.

Educational outreach about proper waste disposal and minimizing other visitor impacts, along with monitoring management actions for effectiveness and efforts to reduce crowding during heavy use periods, would have minor, long-term, local, and positive effects on water quality and aquatic habitats in the Kongakut River drainage. Water quality and aquatic habitats can be affected by increased visitor use through increased vegetation trampling and soil compaction, which increases the potential for runoff and sediment loading.

Vegetation and Terrestrial Habitats

Wilderness – Alternative E would recommend additional portions of the Refuge for wilderness designation. If Congress were to designate these areas, the Refuge would replace the existing Minimal Management category with Wilderness Management. Although management strategies are similar for Wilderness and Minimal Management, wilderness designation is a more permanent commitment to maintain natural conditions. Wilderness designation would have minor, long-term, WSA-wide, and positive effects because it provides additional restrictions in managing wilderness.

Temporary structures may be authorized in wilderness. They could have moderate, medium-term, site-specific, and negative effects.

Wild and Scenic Rivers – If Congress were to designate rivers, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects. Visitor use may damage vegetation and terrestrial habitats along the riverbank, where informal trails form seasonally due to heavy foot traffic and at put-in locations.

Kongakut River – Refuge visitors may damage vegetation and habitats, particularly at campsites and access points such as landing areas. Potential damage includes direct effects of trampling on vegetation; indirect effects of soil and snow compaction as a result of trampling; breakage of trees and shrubs; possible introduction of invasive plants; and exclusion of wildlife from riparian and adjacent habitats. Most disturbances to vegetation are site-specific and restricted to areas receiving repeated use, such as hunting camps near fixed-wing aircraft-accessible sites and campsites used by floaters along the Kongakut River. These areas are

presently monitored and assessed for negative impacts. These disturbances are minor to moderate, long-term, local, and positive.

Fish Populations and Natural Diversity

Wilderness – The Brooks Range, Porcupine Plateau, and Coastal Plain WSAs include many fish-bearing rivers and streams. Wilderness designation would provide more permanent and stringent protections for fish habitat than current Minimal Management. Effects of designation of these WSAs on fish populations and natural diversity resulting from enhanced habitat protections would be minor to major, long-term, Refuge-wide, and positive.

Wild and Scenic Rivers – Should Congress designate rivers, CRMPs would be prepared, resulting in minor, long-term, local, and positive effects.

Kongakut River – Dolly Varden and grayling are popular fish for anglers on the Kongakut River. Harvest of these fish species is unknown and thought to be low, and negligible and local-scale positive effects would result from developing educational materials on proper catch-and-release techniques, and could lead to increased survival rates of released fishes. Redistributing the number of user groups on the river would also have positive effects by reducing substrate disturbance in and out of the river. This effect would be negligible, long-term, local, and positive.

Bird Populations and Natural Diversity

Wilderness – Wilderness designation would provide more permanent and stringent protections for bird habitat than current Minimal Management. Maintaining natural conditions would have positive effects on bird populations and natural diversity in the Brooks Range, Porcupine Plateau, and Coastal Plain WSAs. Because most bird species are migratory, beneficial effects could be expressed over a larger area than the WSAs. Under current management, disturbance to birds and alteration of their habitats is minimal. However, wilderness designation, with its long-term commitment to maintaining natural conditions, could have minor to major, long-term, regional or greater, and positive effects.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on bird populations and natural diversity under this alternative. Riparian areas tend to have higher density and diversity of birds compared to surrounding habitats.

Kongakut River – Enhanced efforts to enforce special use permit conditions, redistribute crowding during peak periods, disperse aircraft flight paths, target education on low-impact recreational use, and enhance impact monitoring would have minor, long-term, site-specific, and positive effects on bird populations and natural diversity in the Kongakut River corridor. Monitoring impacts to habitats by visitors would lead to development of conservation measures to mitigate visitor impacts on birds. Educational materials would benefit birds by helping visitors reduce disturbance to nesting raptors and other species, and minimize impacts to bird habitats.

Mammal Populations and Natural Diversity

Wilderness – Wilderness designation would result in minor to major, long-term, WSA-wide to regional, and positive effects for a variety of mammals. Allowed activities are similar under current Minimal and Wilderness Management, but wilderness designation is a more permanent and stringent commitment to protect mammal populations and habitats.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on mammal populations and natural diversity under this alternative.

Kongakut River – Enhanced efforts to enforce special use permit conditions, redistribute crowding during peak periods, disperse flight paths, target education on low-impact recreational use, and enhance impact monitoring would have minor, long-term, site-specific, and positive effects on mammal populations and natural diversity in the Kongakut River corridor. Monitoring impacts to habitats by visitors would lead to development of conservation measures to mitigate visitor impacts on mammals. Educational materials would benefit mammals by helping visitors reduce disturbance to resident and migratory species, and minimize impacts to mammal habitats.

5.7.2 Impacts to the Human Environment from Alternative E

Wilderness – The Brooks Range WSA excludes approximately 39,549 acres of Refuge land in the vicinity of Arctic Village and Old John Lake. The area is not qualified for wilderness designation because of its close proximity to an active community with its airport, generator complex, daily use areas, and notable concentrations of private Native allotments. An area of 180,117 acres (inclusive of the non-qualified area) of Refuge land near Arctic Village has been determined to be non-suitable for wilderness designation through an evaluation of manageability. In determining manageability, the Service considers factors such as land status and Service jurisdiction, existing inholdings and private rights, Refuge management activities, and public uses. This area is non-suitable because it is a high use area for Arctic Village residents, and the extent of authorized activities such as firewood and house log cutting would make it difficult to manage as wilderness. Motorized activity is frequent in this area, and it contains a large number of inholdings.



The Coastal Plain WSA excludes approximately 9,978 acres of Refuge waters near the village of Kaktovik. The area is not qualified for wilderness designation because of its close proximity to an active community with its airport, generator complex, daily use areas, and sights and sounds of the community. A 29,160-acre area (inclusive of the non-qualified area) of lagoon waters near Kaktovik has been determined to be non-suitable for wilderness designation through an evaluation of manageability. In determining manageability, the Service considers factors such as land status and Service jurisdiction, existing inholdings and private rights, Refuge management activities and public uses. This area is non-suitable because it is a high use area for Kaktovik residents and sees frequent use of motorized vehicles and boats and has numerous private inholdings, making it difficult to manage as wilderness.

The Brooks Range, Coastal Plain, and Porcupine Plateau WSAs are currently managed under the Minimal Management category. Additionally, ANILCA Section 1004 requires that the Coastal Plain area be administered to retain its wilderness character and potential for inclusion in the NWPS unless Congress determines otherwise. Under current management, public use of the Refuge is managed similarly in wilderness and non-wilderness. Most restrictions on public use are derived from the area's status as a refuge and its regulations (e.g., Refuge Administration Act, Refuge Improvement Act, ANILCA, etc.) or are enacted by State laws (ADFG hunting regulations, Alaska Statute 19.40.210 prohibition of off-road vehicles from the Dalton Highway).

Wild and Scenic Rivers – Alternative E recommends the Refuge's four suitable rivers: Atigun, Marsh Fork Canning, Hulahula, and Kongakut Rivers. If Congress were to designate any of the rivers, CRMPs would be developed for the continued protection of the rivers and their ORVs.

Kongakut – Under this alternative, there would continue to be an unlimited number of commercial operators offering trips on the Kongakut River. Guides and air-taxis would continue to have Kongakut River specific permit conditions, and guides would continue to be restricted to one guided trip on a river or water body at any given time. Visitor use monitoring of physical impacts and enforcement concerns would continue to occur occasionally. Management would be more proactive than hands-off with revising a monitoring program, public awareness, publishing launch schedules, rehabilitating selected impacted areas as well as increasing enforcement efforts, redistributing the number of groups on the river, and working with commercial air-taxi operators. A Refuge-wide step-down management plan would be developed to address specific areas of concern and management strategies. Because this step-down plan has not been developed concurrently with the Revised Plan, the effects of this component of the alternative have not been analyzed.

Local Economy and Commercial Uses

Wilderness – Recommending the rest of the Refuge as wilderness could have varied effects on commercial uses. In designated wilderness, the Wilderness Act of 1964 and Service wilderness policy prohibit commercial enterprises with few exceptions. Visitor services that allow people to access the Refuge, such as guides and transportation companies, are allowed. Commercial filming is only allowed according to policy. Designation would provide more wilderness for exploration and could potentially attract more visitors to the area, resulting in increased business prospects for recreation guides, air operators, and service providers in local communities. Big-game hunting guides in the Brooks Range, Porcupine Plateau, and Coastal Plain WSAs could have to comply with stricter guidelines (i.e., no base camps, no airplanes in camp, perhaps limits to the amount of flight time, etc.). Wilderness designation of the Coastal

Plain WSA could have a major, long-term, negative effect on local and State economic development by restricting potential for oil and gas exploration and development of the 1002 Area. These impacts would likely be Refuge-wide and regional in nature.

Wild and Scenic Rivers – There would be no to negligible, short-term to long-term, local, and negative effects to the local economy and commercial uses based on proactively managing those rivers according to interim management prescriptions.

There would be minor to moderate, long-term, local, and negative effects on the local economy and commercial uses as a result of implementing the CRMPs. With designation, the Refuge would have authority to limit and control public use, thereby affecting the local economy and commercial use providers.

Kongakut River – Reducing the number of commercial trips during peak periods would limit the economic contribution of the river. If the number of trips were limited, some service providers may decide not to offer a trip(s) on the Kongakut. Ultimately, this could limit the number of service providers, including air-taxis. It could also displace use elsewhere on Arctic Refuge. The effects would likely be moderate, long-term, local, and negative.

A step-down plan would likely have effects on the local economy and commercial uses. Step-down planning would be done in conjunction with key stakeholders and the public. The effects would likely be moderate, long-term, local, and positive.

Cultural Resources

Wilderness – Potential wilderness designation could have minor, long-term, WSA-wide to regional, and positive effect on cultural resources. Wilderness areas would restrict potential facilities and recreational “improvements,” most commercial enterprises, and helicopters and installations, to varying degrees. Wilderness designation could provide further long-term protection for cultural resources and traditional lands, waters, and resources used by local residents and serve to perpetuate the natural conditions in which their cultures evolved.

People using wilderness for a variety of purposes might cause some damage to sites (intentionally or unintentionally). There is also the potential to lose some sites to natural forces such as erosion. Effects would range from minor to major, long-term, site-specific, and negative or positive.

Wild and Scenic Rivers – Cultural resources on the arctic North Slope and Coastal Plain are on or near the surface of the tundra and tend to be oriented along river corridors and coastal beaches. Impacts could occur from people using Refuge lands and waters for a variety of purposes, which could cause damage to cultural resources or sites (both intentionally and unintentionally). The effects would range from minor to major, long-term, local, and positive or negative. The Hulahula River has a Cultural ORV, and the Refuge would have to provide a higher level of protection for cultural resources along this river. Designation of the four rivers would result in minor to moderate, long-term, local, and negative or positive effects.

Kongakut River – Education and outreach emphasizing stewardship of cultural resources in the Kongakut River drainage would likely minimize potential impacts. Cultural resources would be protected and managed in accordance with Federal and State laws. Visitors to the Kongakut may cause some damage to sites (intentionally or unintentionally), and some sites or resources may be lost to natural forces. The overall impact on cultural resources would be

consistent with the past. The effects range from minor to major, long-term, site-specific, and negative or positive.

Subsistence

Wilderness – Potential wilderness designation on all additional lands could provide another level of long-term protection to habitats and natural conditions, especially those found near Arctic Village and Venetie, and serve to perpetuate the subsistence resources village residents are so dependent upon. Designation might also limit potential encroachment from development. Designation would not restrict subsistence users from utilizing resources in the Refuge, and the right of subsistence users to conduct traditional activities using traditional modes of transportation would continue. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Designation could increase visitor use near Arctic Village’s and Kaktovik’s traditional and subsistence use areas, which could increase conflicts between locals and visitors. In general, subsistence uses in wilderness would continue as they have under Minimal Management, and the harvest of subsistence resources would continue. These impacts would likely be minor, long-term, local, and positive.

Wild and Scenic Rivers – Under this alternative, interim management prescriptions, combined with educational outreach regarding cultural and subsistence use in the recommended river drainages, could improve understanding and reduce real and/or perceived conflict between local users and non-local visitors. The effects are likely to be minor, long-term, local, and positive. Designation would result in minor to moderate, long-term, local, and negative or positive effects because it could limit or control public use, ensuring fewer conflicts between subsistence and public use.

Kongakut River – Educational outreach regarding cultural and subsistence use in the Kongakut River drainage could improve understanding and reduce real and/or perceived conflict between local users and non-local visitors. The effects would likely be minor, long-term, local, and positive.

Visitor Services and Recreation Opportunities

Wilderness – Designation of the Brooks Range, Porcupine Plateau, and Coastal Plain WSAs as wilderness could affect visitor services and recreational opportunities. Commercial filming is only allowed according to policy. Designation of more wilderness could positively affect recreational opportunities for solitude, exploration, and freedom. All activities, including commercial services, biological and cultural research and monitoring, and access in newly designated wilderness, would be closely scrutinized. There would be more restrictions on intrusive research methods and access, which could positively impact a visitor’s Refuge wilderness experience. Designation of the Brooks Range WSA could benefit those visitors who cannot afford the high costs of flying into the remote regions of the Refuge wilderness because it is accessible from the Dalton Highway. These impacts are likely to be wilderness-wide, long-term, and moderate to major in scale, and positive.

To preserve wilderness values, the Refuge may decide to have less law enforcement and staff presence on the ground. Opportunities to visit with either law enforcement or other staff

could eliminate potential outreach and education opportunities. These effects would likely be minor, short-term or temporary, site-specific, and negative or positive, depending on the user.

Wild and Scenic Rivers – Implementing interim management prescriptions would have no effect on visitor services or recreational opportunities. However, newly designated wild rivers could attract more visitors. If the number of visitors exceeds the determined user capacity of a specific river corridor, the Refuge might need to limit use. The effects would likely be minor to moderate, long-term, local, and positive or negative. Visitor experience could be enhanced by limiting use; however, those visitors not be able to experience the river could be frustrated due to lack of river access. Any limitations on use of the designated rivers could potentially displace visitors to other rivers in the Refuge.

Kongakut River – There would be fewer opportunities for visitors to take guided trips on the Kongakut River, and there could be fewer service providers. This might displace use elsewhere on Arctic Refuge. However, displacement would be mitigated by adopting a Refuge-wide step-down plan. This alternative proposes to adopt management strategies based on a Refuge-wide step-down plan. The benefit of this would be that use and issues on the Kongakut might not be displaced to other areas of the Refuge. The drawback would be that the Kongakut experiences issues specific to its corridor, and these issues may not receive adequate attention under a Refuge-wide plan. As the step-down plan unfolds, it is likely to have impacts on visitor services and recreational opportunities. The effects are likely to range from minor to moderate, long-term, local, and positive or negative.

The other components of this alternative would also likely have effects. Developing educational outreach materials with preferred practices and strategies for minimizing impacts would likely raise the level of awareness of commercial and private users. In turn, this could lead to higher quality experiences for all users by reducing the amount of physical and experiential impacts occurring on the river. However, none of these messages would be regulations; therefore, they would not be enforceable. Educational outreach may not be a strong enough tool to produce the desired effects. The effects are likely to range from minor to moderate, long-term, local, and positive.

Improving monitoring programs for physical and social conditions could better inform management of areas of concern, thus allowing management to take appropriate, responsive action before continued degradation occurs. However, conducting site-specific monitoring and rehabilitation means Refuge staff could contribute to crowding and add to cumulative negative impacts. The effects are likely to be minor, long-term, local, and positive or negative.

Publishing schedules of past guided and non-guided visitor use (currently available through commercial permit client use reports) would likely do little to redistribute use across the season, since demand is driven by two temporally discrete events: caribou migration and the Dall's sheep hunting season. This concentration of use is compounded by the fact that water levels are likely to be better for floating during these times. The effects are likely to be minor, long-term, local, and positive.

Wilderness Values

Wilderness – Designating additional wilderness would have a positive effect on wilderness values. An MRA would be required on all new activities, and helicopter access would be more closely scrutinized and minimized. More invasive research methods would be limited or minimized. Additionally, wilderness areas are protected from roads, facilities, recreational

“improvements,” commercial enterprises, and—to varying degrees—helicopters and installations. These provisions would enhance wilderness values and people’s experiences in the area. These effects would likely major, long-term, regional, and positive due to the addition of nearly 11.2 million wilderness acres, encompassing almost the entire Refuge.

Wild and Scenic Rivers – Implementing interim management prescriptions would have no effect on wilderness values. However, designation would result in minor to moderate, long-term, local, and positive effects because Wild and Scenic Rivers Act protections are additive to wilderness designations. Wild rivers in wilderness would have the highest level of protection in the Refuge. In addition, the Refuge would have the ability to limit and control public use on these river corridors, thereby enhancing wilderness values. The effects would be minor to moderate, long-term, local, and positive.

Kongakut River – Working with operators to disperse flight paths could reduce air traffic, improving the wilderness experience for visitors. Because Arctic Refuge does not have jurisdiction over airspace, compliance with this request could not be enforced. The effects are likely to be moderate, long-term, local, and positive.

Improved monitoring of visitor experiences would: 1) tie observed conditions to management goals for biophysical resources; 2) help identify thresholds of acceptable changes in the biophysical environment; and 3) provide input on actions that could be taken to prevent negative wilderness character indicator thresholds from being reached. The effects would be moderate, long-term, local, and positive.

Visitors seeking solitude and other values associated with wilderness may have already been displaced from the Kongakut. Due to the lack of enforceability of outreach education efforts, displacement will likely continue to occur. The effects are likely to be minor, long-term, local, and negative.

Rehabilitating impacted sites could help restore the river to its natural condition, thus improving wilderness value. The effects are likely to be minor, long-term, local, and positive.

Special Designations

Wilderness – There would be minor, long-term, WSA-wide, and positive effects of wilderness designation on the MPA because it is in the Coastal Plain WSA. If designated, this would provide additional protections for the MPA.

There would be negligible to minor, long-term, WSA-wide, and positive effects to wild rivers as a result of wilderness designation. The lower portion of the Sheenjek, Ivishak, and Wind Rivers would receive additional protection from being in designated wilderness.

Wild and Scenic Rivers – The Shublik Springs Research Natural Area is downstream from the Marsh Fork Canning River. There would be negligible to minor, long-term, local, and positive effects for Shublik Springs if the Marsh Fork is designated as a wild river; the Marsh Fork would have added resource protections, and visitor experiences would be expected to improve.

Kongakut River – There would be negligible, long-term, local, and positive effects to the MPA as a result of more proactive management of the Kongakut River.

Public Health and Safety

Wilderness – Wilderness designation would not have an impact on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Wild and Scenic Rivers – There would be no effect on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Kongakut River – This alternative commits to increased enforcement efforts, which would mean enforcement officers would be more likely to be on site in the case of an emergency. The effects are likely to be negligible, long-term, local, and positive.

Refuge Operations

Wilderness – Designating all additional Refuge lands as wilderness could have effects on overall Refuge operations. Although Refuge lands are currently either managed as designated wilderness or minimal management, designated wilderness requires more hours to manage.

Currently, DOI and Service policies require an MRA and ANILCA Section 810 analysis for all special use permits (commercial service providers, biological and cultural research and monitoring, access, etc.) and for any new administrative activity in designated wilderness. Many activities are prohibited or highly regulated in designated wilderness but can occur on lands managed under the Refuge's Minimal Management category with less regulation. If the Brooks Range WSA is designated as wilderness, requested activities would be required to go through a more rigorous process. For example, the ability to manage visitor use by monitoring with remote sensing technology could be impacted by limitations placed on installations in wilderness.

Depending on the activity, NEPA processes and the involvement of experts outside the Refuge staff could be required before making a decision on the proposed activity. New wilderness designation could increase the paperwork burden for all permit applicants and the Refuge staff. These effects would likely be minor to moderate, long-term, WSA-wide, and negative.

Additionally, some research that is currently occurring or authorized in the Brooks Range, Porcupine Plateau, or Coastal Plain WSA could become highly regulated and possibly not allowed. If a proposed activity is not necessary to manage the lands as wilderness, then the activity would not be allowed. For example, climate change research and installations (such as weather stations, soil temperature gauges, stream gauges, etc.) not directly associated with the management of wilderness lands might not be employed to gather data in the wilderness. This could limit climate change data gathering capabilities in the Refuge and possibly in the region. These effects would likely be major, long-term, Refuge-wide to regional, and negative.

Wild and Scenic Rivers – There would be no effect to Refuge operations under interim management prescriptions. For designation, there would be effects to Refuge operations. There would be an additional workload for preparing CRMPs in the short term; the effects would be moderate to major, short-term, Refuge-wide, and negative. In the longer term, monitoring and the potential for adjusting user limits would result in moderate, long-term, Refuge-wide, and negative effects. Once the CRMPs are completed and monitoring protocols and a system for managing the rivers are in place, there should be less strain on Refuge staff dealing with day-to-day issues.

Kongakut River – Increased enforcement efforts would require more staff time and could require hiring another officer. The effects are likely to be minor, long-term, local, and negative. This alternative would require additional staff time and budget to 1) execute a monitoring program; 2) develop educational outreach materials; 3) compile and publish schedules of proposed launch dates; 4) conduct site-specific rehabilitation; and 5) develop and execute a step-down management plan. The effects are likely to be moderate, long-term, Refuge-wide, and positive.

5.7.3 Cumulative Impacts of Alternative E

The Brooks Range WSA (5.4 million acres), Porcupine Plateau WSA (4.4 million acres), and Coastal Plain WSA (1.4 million acres) would be recommended for designation as wilderness. While the cumulative effects for designation would be minor to moderate, it does provide a more permanent statutory protection to the biophysical and human environments. The cumulative effect of having nearly 19.2 million acres of wilderness managed as part of the Refuge would result in minor to moderate effects. Wilderness would be subject to MRA. Lands outside designated wilderness are administered as Minimal Management.

All four suitable rivers would be recommended for wild and scenic river designation: the Kongakut, Marsh Fork Canning, Hulahula, and Atigun Rivers. As such, there would be the cumulative effect of all these rivers being afforded the protections of the Wild and Scenic Rivers Act, as well as permanent management prescriptions, particularly the ability to limit and control visitor use. The cumulative effects of these actions would present minor to moderate effects to the biophysical and human environments.

Cumulative effects as a result of management actions for the Kongakut River under this alternative would be minor as a result of increasing education and outreach and more proactively managing the area.

As visitor use increases, there is the potential for some minor cumulative effects to the biophysical and human environments, particularly the visitor experience. In addition, there would be an increased workload and funding requirements as a result of implementing this alternative. There would be a minor to moderate cumulative effect on Refuge operations.

These effects would be cumulative to the effects of climate change, development activities, and management decisions made by others throughout the region.

5.8 Effects of Alternative F

This section evaluates the implication or impacts on resources categories in each major issue: wilderness, wild and scenic rivers, and the Kongakut River.

Introduction

Wilderness – Under this alternative, approximately eight million acres of the Refuge would continue to be administered as wilderness and no new areas would be recommended for designation. No additional wilderness designation in the Coastal Plain could allow the 1002 Area to more easily be opened by Congress to oil and gas.

Wild and Scenic Rivers – Under this alternative, no new wild and scenic rivers are recommended. The suitability study preliminarily determined that four of the Refuge's rivers are suitable for wild river designation: Atigun, Marsh Fork Canning, Hulahula, and Kongakut Rivers. The effects described here are specific to a “no recommendation” alternative, but even without a recommendation for designation, the ORVs for the four suitable rivers still need to be protected. Interim management prescriptions will be required for all four rivers in Alternative F.

Kongakut River – Alternative F proposes that Kongakut River management issues be addressed in step-down planning (i.e., Visitor Use Management Plan and Wilderness Stewardship Plan). It would also establish several new programs to protect resources in the Kongakut River Valley. The Service would develop educational materials for the public with targeted messages explaining preferred visitor practices and strategies for minimizing impacts, such as proper waste disposal, avoiding wildlife impacts, and alleviating crowding among groups. The Service would provide the public with schedules of proposed guided trip launch dates and past visitor use activity patterns. Rehabilitation of heavily impacted sites would be conducted when necessary. The Service would revise a monitoring program of physical and social conditions to evaluate the effectiveness of management actions.

5.8.1 Impacts to the Biophysical Environment from Alternative F

Permafrost and Soils

Wilderness – Areas of the Refuge not currently designated as wilderness or wild rivers are managed under the Refuge's Minimal Management category. Temporary facilities may be authorized in Minimal Management. If a temporary facility were allowed, the effect would be minor, short to medium-term, site-specific, and negative. The effects of retaining the current mix of Wilderness, Wild River, and Minimal Management areas on permafrost and soils would be minor, site-specific, short to medium term, and negative.

Wild and Scenic Rivers – While no rivers would be recommended, interim management prescriptions would result in negligible, long-term, local, positive effects on soils in the corridors of suitable rivers that receive public use. However, visitor use might still damage soils and permafrost, for example, at heavily used campsites.

Kongakut River – Refuge visitors have the potential to damage soils and permafrost by trampling, particularly at campsites and access points such as landing areas. Damage can include destruction of soil structure by compaction, removal of the uppermost organic layers of

soil, soil erosion, melting of permafrost, and ground subsidence due to melting of buried ice and permafrost. Enhanced management of visitor use in the Kongakut River area under Alternative F would decrease these site-specific impacts. Site-specific disturbances from visitors occur extensively up and down the Kongakut River corridor, so enhanced management would also decrease impacts at the local scale. This alternative would have minor to moderate, long-term, local, positive impacts on permafrost and soils in the Kongakut River corridor.

Water Quality and Aquatic Habitats

Wilderness – Proposing no new wilderness areas would not affect water quality and aquatic habitats in non-designated areas. Water bodies in designated wilderness would continue to benefit from the high level of habitat protection that wilderness affords.

Wild and Scenic Rivers – While no rivers would be recommended, interim management prescriptions would result in negligible, long-term, local, and positive effects on water quality and aquatic habitats along river corridors of non-designated rivers that receive public use.

Kongakut River – Educational outreach about proper waste disposal and minimizing other visitor impacts, along with monitoring management actions for effectiveness, would have minor, long-term, local, and positive effects on water quality and aquatic habitats in the Kongakut River drainage. Water quality and aquatic habitats can be affected by increased visitor use through increased vegetation trampling and soil compaction, which increases the potential for runoff and sediment loading.

Vegetation and Terrestrial Habitats

Wilderness – Temporary facilities may be authorized in designated wilderness. Under this alternative, effects could range from minor to major, long-term, site-specific to Refuge-wide, and negative.

Wild and Scenic Rivers – While no rivers would be recommended, interim management prescriptions would result in negligible, long-term, local, and positive effects on vegetation and terrestrial habitats along the corridors of suitable rivers that receive public use. However, visitor use might still damage soils and permafrost, for example, at heavily used campsites.

Kongakut River – Refuge visitors may damage vegetation and habitats, particularly at campsites and access points such as landing areas. Potential damage includes direct effects of trampling on vegetation; indirect effects of soil and snow compaction as a result of trampling; breakage of trees and shrubs; possible introduction of invasive plants; and exclusion of wildlife from riparian and adjacent habitats. Most disturbances to vegetation are site-specific and restricted to areas receiving repeated use, such as hunting camps near fixed-wing aircraft-accessible sites and campsites used by floaters along major rivers. These areas are presently monitored and assessed for negative impacts.

Implementation of Alternative F would decrease site-specific impacts to vegetation and habitats. Alternative F would have minor to moderate, long-term, local, and positive impacts on vegetation and habitats in the Kongakut River area.

Fish Populations and Natural Diversity

Wilderness – No effects on fish populations and natural diversity would occur if no new wilderness recommendations are made.

Wild and Scenic Rivers – While no rivers would be recommended, interim management prescriptions would result in negligible, long-term, local, and positive effects on fish populations and natural diversity in the corridors of suitable rivers.

Kongakut River – Dolly Varden and grayling are popular fish for anglers on the Kongakut River. Harvest of these fish species is unknown and thought to be low. Negligible, long-term, local, and positive effects would result from developing educational materials on proper catch-and-release techniques, potentially leading to increased survival rates of released fishes.

Bird Populations and Natural Diversity

Wilderness – No effects on bird populations and natural diversity would occur if no new wilderness recommendations are made.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on bird populations and natural diversity under this alternative. Riparian areas tend to have higher density and diversity of birds compared to surrounding habitats.

Kongakut River – Enhanced management of human use of the Kongakut River Valley would have negligible to minor, long-term, site-specific, and positive effects on bird populations and natural diversity. Monitoring impacts to habitats by visitors would lead to development of conservation measures to mitigate visitor impacts on birds. Educational materials would benefit birds by helping visitors reduce disturbance to nesting raptors and other species, and minimize impacts to bird habitats.

Mammal Populations and Natural Diversity

Wilderness – No effects on mammal populations and natural diversity would occur if no new wilderness recommendations are made.

Wild and Scenic Rivers – There would be negligible, long-term, local, and positive effects on mammal populations and natural diversity under this alternative.

Kongakut River – Enhanced management of human use of the Kongakut River Valley would have negligible to minor, long-term, site-specific, and positive effects on mammal populations and natural diversity. Monitoring impacts to habitats by visitors would lead to development of conservation measures to mitigate visitor impacts on mammals. Educational materials would benefit mammals by helping visitors reduce disturbance to resident and migratory species, and minimize impacts to mammal habitats.

5.8.2 Impacts to the Human Environment from Alternative F

Wilderness – The non-wilderness areas of Arctic Refuge are currently managed under the Minimal Management category. Additionally, ANILCA Section 1004 requires the Coastal Plain area to be managed to retain its wilderness character and potential for inclusion in the NWPS, unless Congress determines otherwise. Under current management, public use of the Refuge is managed similarly in wilderness and non-wilderness. Most restrictions on public use are derived from the area’s status as a refuge and its regulations (e.g., Refuge Administration Act, Refuge Improvement Act, ANILCA, etc.) or are enacted by State laws (ADFG hunting regulations, Alaska Statute 19.40.210 prohibition of off-road vehicles from the Dalton Highway).

Wild and Scenic Rivers – Alternative F proposes to complete eligibility and suitability studies and then not recommend any rivers. Although the four suitable rivers are not recommended for wild river designation, their ORVs would still need to be protected by implementing interim management prescriptions.

Kongakut river – Under this alternative, there would continue to be an unlimited number of commercial operators offering trips on the Kongakut River. Guides and air-taxis would continue to have Kongakut River specific permit conditions, and guides would continue to be restricted to one guided trip on a river or water body at any given time. Visitor use monitoring of physical impacts and enforcement concerns would continue to occur occasionally. Management would be more proactive than hands-off with revising a monitoring program, improving public awareness, publishing launch schedules, rehabilitating selected impacted areas, redistributing the number of groups on the river, and working with commercial air-taxi operators. A Refuge-wide step-down management plan would be developed to address specific areas of concern and management strategies, such as how to enforce compliance of special use permits. Because this step-down plan has not been developed concurrently with the Revised Plan, the effects of this component of the alternative have not been analyzed.

Local Economy and Commercial Uses

Wilderness – There would be no effect to the local economy or commercial uses. Commercial services would continue as they have and would not be restricted in any way. No additional wilderness recommendations could allow for the 1002 Area to more easily be opened by Congress to oil and gas, preserving this potential economic opportunity.

Wild and Scenic Rivers – There would be no to negligible, short-term to long-term, local, and negative effects to the local economy and commercial uses based on proactively managing suitable rivers according to interim management prescriptions.

Kongakut river – A step-down plan would likely have effects on the local economy and commercial uses. Step-down planning would be done in conjunction with key stakeholders and the public. The effects are likely to be moderate, long-term, local, and positive.

Cultural Resources

Wilderness – People using wilderness for a variety of purposes might cause some damage to sites (intentionally or unintentionally). There is the potential to lose some sites to natural forces such as erosion. Effects would range from minor to major, long-term, site-specific, and negative.

Wild and Scenic Rivers – Cultural resources on the North Slope and Coastal Plain are on or near the surface of the tundra and tend to be oriented along river corridors and coastal beaches. Impacts could occur from people using Refuge lands and waters for a variety of purposes, which could cause damage to cultural resources or sites (both intentionally and unintentionally). The effects would range from minor to major, long-term, local, and positive or negative. Interim management prescriptions would help mitigate these effects.

Kongakut River – Education and outreach emphasizing stewardship of cultural resources in the Kongakut River drainage would likely minimize potential impacts. Cultural resources would be protected and managed in accordance with Federal and State laws. Visitors to the Kongakut may cause some damage to sites (intentionally or unintentionally), and some sites or resources may be lost to natural forces. The overall impact on cultural resources would be consistent with the past. The effects range from minor to major, long-term, site-specific, and negative or positive.

Subsistence

Wilderness – There would be no effect to subsistence opportunities, uses, or resources. Traditional access and subsistence uses would continue to be allowed according to current regulations and policies.

Wild and Scenic Rivers – There would be no effect to subsistence opportunities, uses, or resources. Traditional access and subsistence uses would continue to be allowed according to current regulations and policies.

Kongakut River – There would be no effect to subsistence opportunities, uses, or resources. Subsistence use of the Kongakut is minimal and generally occurs outside the primary recreation seasons.

Visitor Services and Recreation Opportunities

Wilderness – Continuation of current management practices could have effects on visitor services and recreational opportunities. Permits for visitor services would continue to be awarded on either a competitive or non-competitive basis, and proposed activities would be evaluated based on whether or not they occur in designated wilderness. Visitation to the western boundary of the Refuge and popular drainages could continue to increase, which would negatively affect recreational opportunities for solitude and for experiencing resources in a natural condition. These impacts are likely to be minor or moderate in scale, long-term, local, and negative.

Wild and Scenic Rivers – Implementing interim management prescriptions on the Refuge’s four suitable rivers would have no effects on visitor services and recreation opportunities.

Kongakut River – This alternative proposes to adopt management strategies based on a Refuge-wide step-down plan. The benefit of this would be that use and issues on the Kongakut might not be displaced to other areas of the Refuge. The drawback would be that the Kongakut experiences issues specific to its corridor, and these issues may not receive adequate attention under a Refuge-wide plan. However, as the step-down plan unfolds, it is likely to have impacts on visitor services and recreational opportunities. The effects are likely to be minor to moderate, long-term, local, and positive or negative.

The other components of this alternative would also likely have effects. Developing educational outreach materials with preferred practices and strategies for minimizing impacts would likely raise the level of awareness of commercial and private users. In turn, this could lead to higher quality experiences for all users by reducing the amount of physical and experiential impacts occurring on the river. However, none of these messages would be regulations; therefore, they would not be enforceable. Educational outreach may not be a strong enough tool to produce the desired effects. The effects are likely to be minor to moderate, long-term, local, and positive.

Improving monitoring programs for physical and social conditions could better inform management of areas of concern, thus allowing management to take appropriate, responsive action before continued degradation occurs. However, conducting site-specific monitoring and rehabilitation means Refuge staff could contribute to crowding and cumulative negative impacts. The effects are likely to be minor, long-term, local, and negative.

Publishing schedules of past guided and non-guided visitor use (currently available through commercial permit client use reports) would likely do little to redistribute use across the season, since demand is driven by two temporally discrete events: caribou migration and the Dall’s sheep hunting season. This concentration of use is compounded by the fact that water levels are likely to be better for floating during these times. The effects are likely to be minor, long-term, local, and positive.

Wilderness Values

Wilderness – The established WSAs would not receive the protections afforded by the Wilderness Act. Non-wilderness areas would continue to be managed under the administrative Minimal Management category, which includes most of the protections and prohibitions as designated wilderness. However, this is an administrative management category subject to change and does not have the enduring statutory protections afforded by designated wilderness. These impacts are likely to be minor, long-term, Refuge-wide, and negative.

Wild and Scenic Rivers – Implementing interim management prescriptions would have no effect on wilderness values.

Kongakut River – Working with operators to disperse flight paths could reduce air traffic, therefore improving wilderness experiences for visitors. Because Arctic Refuge does not have jurisdiction over airspace, compliance with this request could not be enforced. The effects are likely to be moderate, long-term, local, and positive.

Improved monitoring of visitor experiences would: 1) tie observed conditions to management goals for biophysical resources; 2) help identify thresholds of acceptable changes in the biophysical environment; and 3) provide input on actions that could be taken to prevent negative wilderness character indicator thresholds from being reached. The effects would be moderate, long-term, local, and positive.

Visitors seeking solitude and other values associated with wilderness have likely been displaced from the Kongakut. Due to the lack of enforceability of outreach education efforts, displacement will probably continue to occur. The effects would be minor, long-term, local, and negative.

Rehabilitating impacted sites could help restore the river to its natural condition, thus improving wilderness value. The effects are likely to be minor, long-term, local, and positive.

Special Designations

Wilderness – There would be no effects to any special designations under this alternative.

Wild and Scenic Rivers – There would be no effects to any special designations under this alternative.

Kongakut River – There would be indirect, negligible, long-term, local, and positive effects to the MPA as a result of more proactive management of the Kongakut River.

Public Health and Safety

Wilderness – Maintaining the current extent of designated wilderness would not impact public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Wild and Scenic Rivers – There would be no effect on public health and safety. In emergencies, the Refuge manager is authorized to take whatever prudent and reasonable actions are necessary.

Kongakut River - Educational outreach would have a negligible effect on reducing public health risk created by the accumulation of human waste. However, actions taken in a step-down plan may address human waste and could mitigate the associated public health and safety issues. The effects are likely to be minor, long-term, local, and negative.

Refuge Operations

Wilderness – Under this alternative, there would be no effect on Refuge operations because there would be no additional administrative tasks regarding designated wilderness. Currently, DOI and Service policies require an MRA and an ANILCA Section 810 analysis for all special use permits (commercial service providers, biological and cultural research and monitoring, access, etc.) and any new administrative activity in designated wilderness.

Wild and Scenic Rivers – Implementing interim management prescriptions on the Refuge's four suitable rivers would have no effect on operations.

Kongakut River – This alternative would require additional staff time and budget to 1) execute a monitoring program; 2) develop educational outreach materials; 3) compile and publish schedules of proposed launch dates; 4) conduct site-specific rehabilitation; and 5) develop and execute a step-down management plan. The effects are likely to be moderate, long-term, local, and negative.

5.8.3 Cumulative Impacts of Alternative F

There is no recommended wilderness; therefore, there are no cumulative effects to the biophysical and human environments foreseeable as a result of this action, with the exception of the lack of permanent statutory protection afforded by designated wilderness. No additional wilderness designation in the Coastal Plain could allow for the 1002 Area to more easily be opened by Congress to oil and gas. Lands outside designated wilderness are managed as Minimal Management.

Four rivers would be suitable for wild river designation but would not be recommended. There would be negligible cumulative effects to the biophysical and human environments. Interim management prescriptions would protect ORVs.

Cumulative effects as a result of management actions for the Kongakut River under this alternative would be minor as a result of increasing education and outreach and more proactively managing the area.

These effects would be cumulative to the effects of climate change, development activities, and management decisions made by others throughout the region.



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5.9 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The following table provides a summary and comparison of impacts across the alternatives in each resource category for the major issues: wilderness, wild and scenic rivers (WSR), and the Kongakut River. The effects are described by intensity, duration, scale, and nature of the impacts.

Table 5-1. Environmental Effects

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Resource Category: Permafrost and Soils						
Wilderness	<u>Temporary facilities:</u> Minor to moderate, short- to medium-term, site-specific, negative	<u>Temporary facilities:</u> Moderate, site-specific, medium-term, negative <u>Designation:</u> Minor, long-term, WSA-wide, positive	<u>Temporary facilities:</u> Moderate, site-specific, medium-term, negative <u>Designation:</u> Minor, long-term, WSA-wide, positive	<u>Temporary facilities:</u> Moderate, site-specific, medium-term, negative <u>Designation:</u> Minor, long-term, WSA-wide, positive	<u>Temporary facilities:</u> Moderate, site-specific, medium-term, negative <u>Designation:</u> Minor, long-term, WSA-wide, positive	<u>Temporary facilities:</u> Minor, short- to medium-term, site-specific, negative
WSR	Negligible to minor, short- to long-term, site-specific to local, positive to negative	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	Negligible to minor, short- to long-term, local, positive to negative
Kongakut	Minor, medium-term, site-specific, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive
Resource Category: Water Quality and Aquatic Habitats						
Wilderness	No effect	Minor, long-term, WSA-wide, positive	Minor, long-term, WSA-wide, positive	Minor, long-term, WSA-wide, positive	Minor, long-term, Refuge-wide, positive	No effect

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
WSR	Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	Negligible, long-term, local, positive
Kongakut	Negligible, short-term, site-specific, negative	Minor, long-term, local, positive	<u>Group size:</u> Minor, long-term, local, positive <u>Education:</u> Minor, long-term, local, positive	<u>Group size:</u> Minor, long-term, local, positive <u>Education:</u> Minor, long-term, local, positive	<u>Group size:</u> Minor, long-term, local, positive <u>Education:</u> Minor, long-term, local, positive	Minor, long-term, local, positive
Resource Category: Vegetation and Terrestrial Habitat						
Wilderness	Minor to major, long-term, site-specific, negative	<u>Designation:</u> Minor, long-term, WSA-wide, positive <u>Temporary facilities:</u> Moderate, medium-term, site-specific, negative	<u>Designation:</u> Minor, long-term, WSA-wide, positive <u>Temporary facilities:</u> Moderate, medium-term, site-specific, negative	<u>Designation:</u> Minor, long-term, WSA-wide, positive	<u>Designation:</u> Minor, long-term, WSA-wide, positive <u>Temporary facilities:</u> Moderate, medium-term, site-specific, negative	Minor to major, long-term, site-specific to Refuge-wide, negative
WSR	Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	Negligible, long-term, local, positive

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Kongakut	Minor, medium-term, site-specific, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive	Minor to moderate, long-term, local, positive
Resource Category: Fish Populations and Natural Diversity						
Wilderness	No effect	Minor, long-term, WSA-wide-wide, positive	Minor to major, long-term, WSA-wide-wide, positive	Minor, long-term, WSA-wide-wide, positive	Minor to major, long-term, Refuge-wide, positive	No effect
WSR	Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive <u>Suitable:</u> Negligible, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	<u>Designated:</u> Minor, long-term, local, positive	Negligible, long-term, local, positive
Kongakut	Negligible, short-term, site-specific to local, negative	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, local, long-term, positive
Resource Category: Bird Populations and Natural Diversity						
Wilderness	No effect	Minor, long-term, regional or greater, positive	Minor to major, long-term, regional or greater, positive	Minor, long-term, regional or greater, positive	Minor to major, long-term, regional or greater, positive	No effect
WSR	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive
Kongakut	Minor, short-term, site-specific, negative	Negligible to minor, long-term, site-specific, positive	Negligible to minor, long-term, site-specific, positive	Minor, long-term, site-specific, positive	Minor, long-term, site-specific, positive	Negligible to minor, long-term, site-specific, positive
Resource Category: Mammal Populations and Natural Diversity						
Wilderness	No effect	Minor, long-term, WSA-wide to regional, positive	Minor to major, long-term, WSA-wide to regional, positive	Minor to moderate, long-term, WSA-wide to regional, positive	Minor to major, long-term, WSA-wide to regional, positive	No effect

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
WSR	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Negligible, long-term, local, positive
Kongakut	Minor, short-term, site-specific, negative	Negligible to minor, long-term, site-specific, positive	Negligible to minor, long-term, site-specific, positive	Minor, long-term site-specific, positive	Minor, long-term, site-specific, positive	Negligible to minor, long-term, site-specific, positive
Resource Category: Local Economy and Commercial Uses						
Wilderness	No effect	Minor to moderate, long-term, WSA-wide, negative	<u>Commercial Operators:</u> Minor to moderate, long-term, WSA-wide, negative <u>Oil and Gas:</u> Major, long-term, regional or greater, negative	Minor to moderate, long-term, WSA-wide, negative	<u>Commercial Operators:</u> Minor to moderate, Refuge-wide, negative <u>Oil and Gas:</u> Major, long-term, regional or greater, negative	No effect
WSR	No to negligible, short-term to long-term, local, negative	<u>Suitable:</u> No to negligible, short-term to long-term, local, negative <u>Designation:</u> Minor to moderate, long-term, local, negative	<u>Suitable:</u> No to negligible, short-term to long-term, local, negative <u>Designation:</u> Minor to moderate, long-term, local, negative	<u>Suitable:</u> No to negligible, short-term to long-term, local, negative <u>Designation:</u> Minor to moderate, long-term, local, negative	<u>Suitable:</u> No to negligible, short-term to long-term, local, negative <u>Designation:</u> Minor to moderate, long-term, local, negative	No to negligible, short-term to long-term, local, negative

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Kongakut	<u>In short-term:</u> minor to moderate, local, negative <u>In long-term:</u> moderate to major, local, negative	Moderate, long-term, local positive	Moderate, long-term, local, Positive	<u>Increased compliance:</u> Moderate, long-term, local, negative <u>Step-down planning:</u> Moderate, long-term, local, positive	<u>Increased compliance:</u> Moderate, long-term, local, negative <u>Step-down planning:</u> Moderate, long-term, local, positive	Moderate, long-term, local, positive
Resource Category: Cultural Resources						
Wilderness	<u>Public Use:</u> Minor to major, long-term, site-specific, negative	<u>Public Use:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor, long-term, WSA-wide, positive	<u>Public Use:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor, long-term, WSA-wide, positive	<u>Public Use:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor, long-term, WSA-wide to regional, positive	<u>Public Use:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor, long-term, WSA-wide to regional, positive	<u>Public Use:</u> Minor to major, long-term, site-specific, negative
WSR	Minor to major, long-term, site-specific, negative or positive	<u>Suitable:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor to moderate, long-term, local, negative or positive	<u>Suitable:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor to moderate, long-term, local, negative or positive	<u>Suitable:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor to moderate, long-term, local, negative or positive	<u>Suitable:</u> Minor to major, long-term, site-specific, negative or positive <u>Designation:</u> Minor to moderate, long-term, local, negative or positive	Minor to major, long-term, site-specific, negative or positive

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Kongakut	Minor to major, long-term, site-specific, negative	Minor to major, long-term, site-specific, negative or positive	Minor to major, long-term, site-specific, negative or positive	Minor to major, long-term, site-specific, negative or positive	Minor to major, long-term, site-specific, negative or positive	Minor to major, long-term, site-specific, negative or positive
Resource Category: Subsistence						
Wilderness	No effect	Minor, long-term, local, positive	Minor, long-term, local, positive	Minor, long-term, local, positive	Minor, long-term, local, positive	No effect
WSR	No effect	<u>Suitable:</u> Minor, long-term, local, negative or positive <u>Designation:</u> Minor to moderate, long-term, local, negative or positive	<u>Suitable:</u> Minor, long-term, local, negative or positive <u>Designation:</u> Minor, long-term, local, negative or positive	<u>Suitable:</u> Minor, long-term, local, negative or positive <u>Designation:</u> Minor to moderate, long-term, local, negative or positive	<u>Suitable:</u> Minor, long-term, local, negative or positive <u>Designation:</u> Minor to moderate, long-term, local, negative or positive	No effect
Kongakut	No effect	Minor, long-term, local, positive	Minor, long-term, local, positive	Minor, long-term, local, positive	Minor, long-term, local, positive	No effect
Resource Category: Visitor Services and Recreation Opportunities						
Wilderness	Minor to moderate, long-term, local, negative	Minor to moderate, long-term, WSA-wide, positive	Minor, long-term, WSA-wide, positive	Minor to moderate, long-term, WSA-wide, positive	Minor to moderate, long-term, WSA-wide, positive	No effect
WSR	No effect	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local, positive or negative	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local, positive or negative	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local, positive or negative	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local, positive or negative	No effect

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Kongakut	Moderate, long-term, local, negative	<u>Management Strategies:</u> Minor to moderate, long-term, local, positive or negative <u>Education:</u> Minor to moderate, long-term, local, positive <u>Monitoring:</u> Minor, long-term, local, positive or negative <u>Publishing Schedules:</u> Minor, long-term, local, positive	<u>Management Strategies:</u> Minor to moderate, long-term, local, positive or negative <u>Education:</u> Minor to moderate, long-term, local, positive <u>Monitoring:</u> Minor, long-term, local, positive or negative <u>Publishing Schedules:</u> Minor, long-term, local, positive	<u>Management Strategies:</u> Minor to moderate, long-term, local, positive or negative <u>Education:</u> Minor to moderate, long-term, local, positive <u>Monitoring:</u> Minor, long-term, local, positive or negative <u>Publishing Schedules:</u> Minor, long-term, local, positive	<u>Management Strategies:</u> Minor to moderate, long-term, local, positive or negative <u>Education:</u> Minor to moderate, long-term, local, positive <u>Monitoring:</u> Minor, long-term, local, positive or negative <u>Publishing Schedules:</u> Minor, long-term, local, positive	<u>Management Strategies:</u> Minor to moderate, long-term, local, positive or negative <u>Education:</u> Minor to moderate, long-term, local, positive <u>Monitoring:</u> Minor, long-term, local, positive or negative <u>Publishing Schedules:</u> Minor, long-term, local, positive
Resource Category: Wilderness Values						
Wilderness	Minor, long-term, Refuge-wide, negative	Moderate, long-term, WSA-wide, positive	Moderate, long-term, WSA-wide, positive	Major, long-term, Refuge-wide, positive	Major, long-term, regional, positive	Minor, long-term, Refuge-wide, negative
WSR	No effect	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local positive	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local positive	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local positive	<u>Suitable:</u> No effect <u>Designation:</u> Minor to moderate, long-term, local positive	No effect

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Kongakut	Minor to moderate, long-term, local, positive or negative	<u>Monitoring:</u> Moderate, long-term, local, positive	<u>Monitoring:</u> Moderate, long-term, local, positive	<u>Monitoring:</u> Moderate, long-term, local, positive	<u>Monitoring:</u> Moderate, long-term, local, positive	<u>Monitoring:</u> Moderate, long-term, local, positive
		<u>Enforceability:</u> Minor, long-term, local, negative	<u>Enforceability:</u> Minor, long-term, local, negative	<u>Enforceability:</u> Minor, long-term, local, negative	<u>Enforceability:</u> Minor, long-term, local, negative	<u>Enforceability:</u> Minor, long-term, local, negative
		<u>Rehabilitation:</u> Minor, long-term, local, positive	<u>Rehabilitation:</u> Minor, long-term, local, positive	<u>Rehabilitation:</u> Minor, long-term, local, positive	<u>Rehabilitation:</u> Minor, long-term, local, positive	<u>Rehabilitation:</u> Minor, long-term, local, positive
				<u>Working with Operators:</u> moderate, long-term, local, and positive	<u>Working with Operators:</u> moderate, long-term, local, and positive	<u>Working with Operators:</u> moderate, long-term, local, and positive

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Resource Category: Special Designations						
Wilderness	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect
	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect
	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect
	<u>MPA</u> : No effect	<u>MPA</u> : No effect	<u>MPA</u> : Minor, long-term, WSA-wide, positive	<u>MPA</u> : No effect	<u>MPA</u> : Minor, long-term, WSA-wide, positive	<u>MPA</u> : No effect
	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : Negligible to minor, long-term, WSA-wide, positive	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : Negligible to minor, long-term, WSA-wide, positive	<u>Wild Rivers</u> : Negligible to minor, long-term, WSA-wide, positive	<u>Wild Rivers</u> : No effect
WSR	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect
	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : Negligible to minor, long-term, local, positive	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : Negligible to minor, long-term, local, positive	<u>Shublik RNA</u> : Negligible to minor, long-term, local, positive	<u>Shublik RNA</u> : No effect
	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect
	<u>MPA</u> : No effect	<u>MPA</u> : No effect	<u>MPA</u> : No effect	<u>MPA</u> : No effect	<u>MPA</u> : No effect	<u>MPA</u> : No effect
	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Kongakut	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect	<u>PUNA</u> : No effect
	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect	<u>Shublik RNA</u> : No effect
	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect	<u>Firth RNA</u> : No effect
	<u>MPA</u> : No effect	<u>MPA</u> : Negligible, long-term, local, positive	<u>MPA</u> : Negligible, long-term, local, positive	<u>MPA</u> : Negligible, long-term, local, positive	<u>MPA</u> : Negligible, long-term, local, positive	<u>MPA</u> : Negligible, long-term, local, positive
	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect	<u>Wild Rivers</u> : No effect
Resource Category: Public Health and Safety						
Wilderness	No effect	No effect	No effect	No effect	No effect	No effect
WSR	No effect	No effect	No effect	No effect	No effect	No effect
Kongakut	Minor, long-term, local, negative	Minor, long-term, local, negative	Minor, long-term, local, negative	Negligible, long-term, local, positive	Negligible, long-term, local, positive	Minor, long-term, local, and negative
Resource Category: Refuge Operations						
Wilderness	No effect	<u>Paperwork</u> : Minor, long-term, WSA-wide, negative <u>Research</u> : Minor to moderate, long-term, WSA-wide, negative	<u>Paperwork</u> : Minor to moderate, long-term, WSA-wide, negative	<u>Paperwork</u> : Moderate, long-term, Refuge-wide, negative	<u>Paperwork</u> : Moderate to major, long-term, Refuge-wide, negative <u>Research</u> : Major, long-term, Refuge-wide to regional, negative	No effect

Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
WSR	No effect	<u>Suitable:</u> No effect	<u>Suitable:</u> No effect	<u>Suitable:</u> No effect	<u>Suitable:</u> No effect	No effect
		<u>Designation -- in short term:</u> moderate to major, short-term, Refuge-wide, negative	<u>Designation – in short term:</u> moderate, short-term, Refuge-wide, negative	<u>Designation – in short term:</u> moderate to major, short-term, Refuge-wide, negative	<u>Designation – in short term:</u> moderate to major, short-term, Refuge-wide, negative	
		<u>Designation – in long term:</u> moderate, long-term, Refuge-wide, negative	<u>Designation – in long term:</u> minor to moderate, long-term, Refuge-wide, negative	<u>Designation – in long term:</u> moderate, long-term, Refuge-wide, negative	<u>Designation – in long term:</u> moderate, long-term, Refuge-wide, negative	
Kongakut	No effect	Moderate, long-term, Refuge-wide, negative	Moderate, long-term, Refuge-wide, negative	<u>Enforcement:</u> Minor long-term, local, negative	<u>Enforcement:</u> Minor long-term, local, negative	Moderate, long-term, Refuge-wide, negative
				<u>Other Programs:</u> Moderate, long-term, Refuge-wide, negative	<u>Other Programs:</u> Moderate, long-term, Refuge-wide, negative	

5.10 Section 810 Evaluation

ANILCA Section 810 requires an evaluation of the effects on subsistence uses for any action to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands. The evaluation consists of three parts:

- A finding of whether or not a proposed action would have a significant restriction on subsistence uses.
- A notice and hearing if an action is found to have a significant restriction on subsistence uses.
- A three-part determination prior to authorization of any action, if there is a significant restriction on subsistence uses.

Chapter 4 of this document describes the environment of Arctic Refuge in detail, including subsistence and other human uses. This Plan does not propose any new types of uses or developments that would pose risks to subsistence resources or subsistence uses of the Refuge.

Chapter 5 (this chapter) describes anticipated effects of each alternative on the environment, including subsistence and other uses. None of the management alternatives evaluated in this Plan propose actions that would reduce subsistence uses because of direct effects on wildlife or habitat resources or that would increase competition for subsistence resources. Similarly, none of the alternatives would change the availability of resources by altering their distribution or location. None of the alternatives would reduce subsistence uses because of limitations on access or by physical or legal barriers to harvestable resources. On refuge lands in Alaska, including wilderness areas, section 811(b) of ANILCA authorizes the use of snowmobiles, motorboats, dog teams, and other means of surface transportation traditionally employed by local rural residents engaged in subsistence activities. This mandate is carried forward and incorporated in Service regulation in 50 CFR 36.12(a).

This Plan and its alternatives propose a number of future step-down management plans, monitoring programs and other proposed activities. As required by ANILCA Section 810 and NEPA, the Refuge will continue to evaluate the effects of each proposed action on subsistence activities or uses to ensure compliance with ANILCA and NEPA. The Refuge will also continue to work with the Federal Subsistence Board, Subsistence Regional Advisory Councils, local fish and game advisory committees, ADFG, tribes, Native corporations, and other appropriate local sources to determine whether a proposed activity would significantly restrict subsistence activities or uses. If the Refuge determines that a proposal would probably result in adverse effects to subsistence activities or uses, the Refuge would follow the requirements identified in Section 810 before making a final decision on the proposed action.

5.11 Environmental Justice

A Federal agency is required to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations (Executive Order 12898, February 11, 1994, amended January 30, 1995, by Executive Order 12948). This includes health risks and other impacts for people who rely principally on fish or wildlife for subsistence. Subsistence activities encompass much more than just a way of obtaining food or natural materials; subsistence is an important mechanism for maintaining cultural values, family traditions, kinships, sharing practices, and relationships to the land. Alaska Native people describe subsistence as a way of life, being integral to their worldview and among the strongest remaining ties to their ancient cultures. It is as much spiritual and cultural as it is physical.

Iñupiat and Gwich'in people and their ancestors have maintained this vital connection to the land for thousands of years. Bound to a strict code of respect toward nature, they have been the land's stewards and caretakers. Much of Arctic Refuge's legacy exists today largely because they have nurtured it so well. ANILCA recognizes this important connection between Native people and the land for continued cultural and subsistence purposes. Arctic Refuge's vision and management goals also share this Native perspective and values towards the land and nature:

“This untamed arctic landscape continues to sustain the ecological diversity and special values that inspired the Refuge’s establishment. Natural processes continue and traditional cultures thrive with the seasons and changing times; physical and mental challenges test our bodies, minds and spirit; and we honor the land, the wildlife and the native people with respect and restraint. Through responsible stewardship this vast wilderness is passed on, undiminished, to future generations.”

As described in Chapter 4, communities associated with Arctic Refuge are rural, contain many low-income households, and maintain subsistence lifestyles in a mixed, subsistence cash-income economy with high levels of unemployment. Arctic Refuge encompasses major portions of the Iñupiat and Gwich'in traditional homelands, which they have utilized for thousands of years. Continued traditional and cultural uses of the land and waters contribute to the physical and spiritual well-being of individuals and communities, maintain their close relationship to the land, and sustain their profound “sense of place.” The nature of the proposed action, revision of the Plan for the Refuge, is very different from the proposals often associated with environmental justice issues (such as siting of pollution-causing facilities). None of the alternatives evaluated in the draft EIS would place a disproportionate weight of any adverse effects on low-income and/or minority populations.

Maintaining high-quality habitat, healthy populations, and natural diversity of fish and wildlife; maintaining water quality; and providing opportunities for subsistence are legislated purposes of the Refuge. The Service cannot compromise these values and their associated uses under any management alternative. While the alternatives contain slightly different approaches to meeting the purposes, none favor activities or projects that would have direct negative impacts toward low-income and/or minority populations, and none of the alternatives evaluated in this EIS would disproportionately impose adverse cumulative effects on communities in or adjacent to Arctic Refuge. None of the alternatives, management prescriptions, or objectives would increase the pathways of potential contaminants entering into the water supply and subsistence food resources.



5.11.1 Effects of Alternative A

Alternate A does not propose any changes to current management. No new areas would be recommended for wilderness designation, and no new wild rivers would be recommended for designation. Recreation-related commercial enterprise is allowed across the entire Refuge with the exception of the big-game guide use area ARC 12 that surrounds Arctic Village. This guide use area would remain vacant to reduce potential user conflict with subsistence users. Private and commercial activities would continue to be reviewed, managed, and regulated with respect to ANILCA, Refuge establishing purposes, and existing laws, regulations, and policies.

Arctic Refuge covers a vast area that is very remote and rugged, making visitor access into and out of the area quite challenging. Visitor access is primarily by commercial air-taxi or private aircraft and is further limited by the number of suitable landing sites. All commercial service providers are required to obtain special use permits, which contain stipulations to protect Refuge resources and minimize conflicts with other Refuge visitors and subsistence users. Although subsistence activities take place throughout wide areas of the Refuge, they tend to be concentrated along the coast and Coastal Plain regions in the north, and near Arctic Village and Venetie and several major rivers drainages in the south. Subsistence access is primarily by boat in the summer and snowmachine in the winter.

Commercial service providers and visitors operating in areas of high subsistence use could result in a perception of conflict or competition for resources with subsistence users. Simultaneous visits by general hunters (non-local), commercially guided hunters, and recreation groups in some high-use areas have led to reported erosion of visitor experiences, increases in user conflicts, and physical impacts such as human waste accumulations, trash, and site-hardening at commonly used campsites. To minimize

perceived crowding, user conflicts and impacts to resources, commercial recreational river guides are required to limit their trip frequency to one trip per river drainage at a time, as well as commercial guided group size limits of 7 for land activities and 10 for water-based activities. The number of commercial hunting guides and areas they are authorized to provide services in are also limited, as well as the number of hunting clients they may guide. For subsistence users, these management actions are viewed as favorable to minimize impacts to resources, crowding, user conflicts, and potential competition for important subsistence resources.

To minimize potential impacts from containments to resources, Refuge users and visitors are recommended, and commercial visitor use providers are required, to bury human waste at least six to eight inches deep and at least 200 feet away from springs, lakes, and streams. Temporary fuel caches are only allowed in designated areas from May 1 through September 30 and must be approved in advance by the Refuge manager with the specific location identified. Approved fuel caches must be located above the high water line of any water course, be less than 60 gallons, be stored in containers approved for gasoline, and be labeled with the permittee's name, address, and type of fuel. These visitor use management actions are generally viewed favorably for reducing potential impacts to resources by visitors and subsistence users.

The number of big-game guide use areas (16) would remain the same, as would limits on the number of hunting clients authorized for each guide area. Big-game guide use area ARC 12 that surrounds Arctic Village would remain vacant; this includes the Arctic Village Sheep Management Area that is reserved for local federally qualified subsistence users. In recognizing the importance of Native and non-Native rural residents subsistence needs, ANILCA established a rural priority for the subsistence uses of fish and wildlife over other consumptive users in times of scarcity. These provisions are viewed favorably by subsistence users in helping to ensure continued subsistence opportunities on Federal lands.

In addition, and weather permitting, commercial air operators are to maintain a minimum altitude of 2,000 feet above the ground whenever possible and avoid intentional low flights over camps or people to minimize interference with Refuge visitors or subsistence users. All aircraft operations are prohibited from harassing wildlife. Subsistence users' support of these management actions help ensure the subsistence opportunity.

To minimize potential conflicts with subsistence users, commercial service providers are required to: a) review Refuge land status maps to determine the location of private lands and avoid these lands or obtain permission to use these lands from the landowner, b) warn clients that they cannot trespass or camp on any patented or selected Native allotments or conveyed Native corporation lands, c) inform clients that general sheep hunting in the Arctic Village Sheep Management Area is restricted to all sheep hunting except subsistence, and d) encourage clients that hunt on the Coastal Plain to avoid the coast and areas frequented by subsistence hunters.

These management stipulations were incorporated to conserve Refuge resources, reduce crowding and potential visitor and local user conflicts, and ensure Refuge purposes are being met, including the continued opportunity for subsistence use. This alternative does not propose any new changes to how visitors, commercial users, or non-commercial users currently visit the Refuge. Therefore, there are no effects to the local economy, commercial uses, cultural resources, visitor services, recreational opportunities, wilderness values, public health and safety, or Refuge operations. Under current

management actions and visitor use trends, guided commercial use on the Refuge is expected to continue near current levels. Non-guided use on the Refuge is expected to continue to gradually increase. The popularity and levels of recreational visitor use on the Refuge is expected to continue into the future with associated site-specific minor impacts to local physical resources. No new impacts to subsistence activities are expected to occur. There will continue to be a potential for trespass on Native allotments and Native corporation lands, and a potential for conflict with visitors and local users at important high use subsistence use areas. However, with current management stipulations and increased education and outreach to all users, the overall impact to subsistence resources and subsistence activities would likely be local, long-term, and minor in scale.

5.11.2 Effects of Alternative B

The general management stipulations stated in Alternative A would continue in Alternative B. Alternative B would recommend the Brooks Range WSA for wilderness designation. If approved by Congress, this designation would provide further long-term protection for the lands and waters, wildlife, and other resources in this region of the Refuge, which subsistence users depend on. Wilderness designation would serve to perpetuate the natural conditions so essential for continuing a subsistence way of life. However, should the population of a subsistence species decline, wilderness status would require a stronger justification for consideration of intensive management actions such as predator control. This could be viewed as a negative effect if important subsistence wildlife population decline substantially. In recognizing the importance of Native and non-Native rural residents' subsistence needs, ANILCA established a rural priority for the subsistence uses of fish and wildlife over other consumptive users in times of scarcity. These provisions are viewed favorably by subsistence users in helping to ensure continued subsistence opportunities on Federal lands.

Current traditional methods and patterns of motorized and non-motorized access would not be affected by wilderness designation. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Some subsistence users would view the wilderness designation on their homeland as complementary to their subsistence and cultural perspective; others would view wilderness designation as a foreign concept and at variance with their traditional beliefs. The subsistence user groups most affected by the Brooks Range WSA-wide designation would be the south side Gwich'in villages of Arctic Village and Venetie. A resolution adopted by the Gwich'in Nation at their Arctic Village meeting in 1988, and reaffirmed at biannual meetings since, continues to support wilderness review and designation for the Coastal Plain and for all Refuge lands not yet designated as wilderness. This resolution stresses the importance of protecting the land, waters, and traditional and customary ways of life for future generations. The Gwich'in Nation would view the wilderness recommendation for this region as a beneficial effect.

In the Brooks Range WSA, there are 66 conveyed Native allotments, each 40–160 acres in size, for a total of 8,133 acres. The Native allotments are based upon important past subsistence use, and their expected current and foreseeable subsistence use will be consistent with Refuge and wilderness purposes. However, sales to private parties could potentially result in commercial or other development that could detract from the wild

character and subsistence use of the immediate area. The Refuge would continue its policy of offering to purchase inholdings where the owners have decided to sell. If acquired, the Service would manage these lands in accordance with Refuge and ANILCA purposes, including the continued opportunity for subsistence use. The continued use of these lands for all subsistence users would be viewed as a positive effect.

In the Brooks Range WSA, 181,077 acres around Arctic Village, Old John Lake, and adjacent high use areas were found not suitable for wilderness designation. This determination was made after conducting wilderness eligibility and suitability reviews and consulting with leaders from the Native Village of Venetie Tribal Government and the Arctic Village Council. The area would be difficult to manage as wilderness because of its proximity to an active village with supporting infrastructure, such as a busy airport and community electrical generation complex, the high frequency of motorized activities in the area, a concentration of private inholdings, and the village's high use areas for activities such as firewood and house log cutting. These boundaries were determined in consultation with Venetie and Arctic Village Native leaders and elders, who are in support of this exclusion recommendation.

Designation of the Brooks Range WSA could potentially increase visitor interest and use for this region of the Refuge which includes large portions of Arctic Village and Venetie's traditional and subsistence use areas. This could increase competition for local resources between local subsistence users and visitors. However, as in Alternative A, the number of big-game guides and use areas would remain the same, as well as limits on the number of hunting clients authorized for each guide area. Big-game guide use area ARC 12 that surrounds Arctic Village would remain vacant; this includes the Arctic Village Sheep Management Area that is reserved for local federally qualified subsistence users. Continuing these management stipulations and increased education and outreach to all users would minimize potential and perceived conflicts and competition with local subsistence users.

Alternative B recommends wild river designation for the Hulahula, Kongakut, and Marsh Fork Canning Rivers. The East Fork Chandalar River, Porcupine, Canning, and Hulahula Rivers were determined to have a Cultural ORV. Although subsistence activities take place throughout a much wider area and in many more river drainages of the Refuge, these rivers were considered to be eligible based upon their unique cultural or subsistence values—prehistoric, historic, and contemporary. However, after completing the suitability phase of the river review for eligible rivers with various ORVs, only the Atigun, Kongakut, Hulahula, and Marsh Fork Canning Rivers were recommended for wild river designation. Of these suitable rivers, only the Hulahula River has a Cultural ORV. This could be viewed as a negative effect for further long-term protection of cultural resources along the East Fork Chandalar, Porcupine, and Canning Rivers.

If Congress were to designate any of the recommended rivers in this alternative, a CRMP would be developed for each river, and it would identify strategies to provide protection for their outstanding values. These river plans might affect commercial services, visitor services, cultural resources, local economies, recreational opportunities, and wilderness opportunities. There would be a positive effect for further protection of the Cultural ORV for the Hulahula River. There would be no effect to subsistence uses or resources. Traditional access and subsistence use opportunities would continue to be permitted according to current regulations and policies.

In general, subsistence uses in designated wilderness and wild rivers would continue as they have under Minimal Management, and the subsistence purpose would continue to be met. Pathways of potential contaminants into water supplies and subsistence foods resources by human waste accumulation or fuel caches would be mitigated by ongoing management practices and current regulations. No new impacts to subsistence activities are expected to occur under this alternative. However, there will continue to be a potential for trespass on Native allotments and Native corporation lands as well as a potential for conflict with visitors and non-local users at important high use subsistence use areas. With current management stipulations and increased education and outreach to all users, the overall impact to cultural and subsistence resources and subsistence activities would likely be local, long-term, and minor in scale.

5.11.3 Effects of Alternative C

The general management stipulations stated in Alternative A would continue in Alternative C. This alternative would recommend the Coastal Plain WSA be designated as wilderness. Wilderness designation would provide further long-term protection for the lands, wildlife, and other resources subsistence users depend on and would serve to perpetuate the current natural conditions so important for a subsistence way of life. However, should the population of a subsistence species decline, wilderness status would require a stronger justification for consideration of intensive management actions such as predator control. In recognizing the importance of Native and non-Native rural residents subsistence needs, ANILCA established a rural priority for the subsistence uses of fish and wildlife over other consumptive users in times of scarcity. These provisions are viewed favorably by subsistence users in helping to ensure continued subsistence opportunities on Federal lands.

Current traditional methods and patterns of motorized and non-motorized access would not be affected by wilderness designation. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Some subsistence users would view the wilderness designation on their homeland as complementary to their subsistence and cultural perspective; others would view wilderness designation as a foreign concept and at variance with their traditional beliefs. The subsistence user groups most affected by the Coastal Plain WSA-wide designation would be the north side Inupiat village of Kaktovik.

Comments received from several members of the Native Village of Kaktovik Tribal Government, representatives of Arctic Slope Native Regional Corporation, and various public speakers during public scoping meetings opposed wilderness designation for the Coastal Plain WSA. They believe future economic development opportunities, such as oil and gas development in the 1002 Coastal Plain area (if opened by Congress) would be impacted. Wilderness designation could have a negative, long-term, local effect on economic development by restricting potential oil and gas exploration and development of the 1002 Area. Other Native representatives recommended designation of the Coastal Plain as wilderness because of its importance for a variety of subsistence resources, including the calving and nursery grounds for the Porcupine caribou herd. The Gwich'in Nation adopted a resolution at Arctic Village in 1988, and reaffirmed at biannual meetings since, to support wilderness review and designation for the Coastal Plain and for all

Refuge lands not yet designated as wilderness. The Gwich'in Nation's resolution stresses the importance of protecting the land and waters and the traditional and customary ways of life for future generations. Gwich'in elders and tribal leaders describe the caribou calving and nursery ground of Arctic Refuge's Coastal Plain as a "Sacred Place Where Life Begins."

Several members from the Native Village of Kaktovik and the Arctic Slope Native Corporation opposed wilderness designation because they believed it would impact subsistence use and access, particularly regarding all-terrain vehicle use for access to resources and to Native allotments. Current traditional methods and patterns of motorized and non-motorized access would not be affected by wilderness designation. Traditional access and subsistence uses would continue to be permitted according to ANILCA and current regulations and policies.

The Coastal Plain WSA contains 29 Native allotments, each 40–160 acres in size, for a total of 1,520 acres. These allotments were conveyed due to their important past subsistence use, and their current and foreseeable subsistence use is consistent with Refuge and wilderness purposes. However, sales to private parties could potentially result in commercial or other development that could detract from the wild character and subsistence uses of the immediate area. The Refuge would continue its policy of offering to purchase inholdings where the owners have decided to sell. If acquired, the Service would manage these lands in accordance with Refuge and ANILCA purposes, including the continued opportunity for subsistence use. There is a 29,160-acre area of lagoon waters near Kaktovik, which is not being recommended for wilderness designation due to the proximity to a large and active village. This area encompasses the village's high daily use area with supporting infrastructure such as a busy airport, community electrical generation complex, the military Barter Island Long Range Radar Site, a Borough landfill, a number of Native allotments, and a high frequency of motorized vehicle activities. The exclusion area boundaries were determined in consultation with Native leaders and elders from the Native Village of Kaktovik Tribal Government, who are in support of this recommendation.

Alternative C recommends wild river designation for Atigun River. If Congress were to designate this river, a CRMP would need to be developed that would identify strategies to provide protection for their outstanding value, which might affect the commercial services, visitor services, cultural resources, local economies, recreational opportunities, and wilderness opportunities. There would be no effect to subsistence uses or resources. Traditional access and subsistence use opportunities would continue to be permitted according to current regulations and policies.

In general, subsistence uses in designated wilderness and wild river corridors would continue as they have under Minimal Management, and the subsistence purpose would continue to be met. Pathways of potential contaminants into water supplies and subsistence foods resources by human waste accumulation or fuel caches would be mitigated by ongoing management practices and current regulations. No new impacts to subsistence activities are expected to occur. However, there will continue to be a potential for trespass on Native allotments and Native corporation lands, as well as a potential for conflict with visitors and non-local users at important high use subsistence use areas. With current management stipulations and increased education and outreach to all users, the overall impact to cultural and subsistence resources and subsistence activities would likely be local, long-term, and minor in scale.

5.11.4 *Effects of Alternative D*

The general management stipulations stated in Alternative A would continue in Alternative D. This alternative would recommend wilderness designation of the Brooks Range and Porcupine Plateau WSAs. Wilderness designation would provide further long-term protection for the lands, wildlife, and other resources subsistence users depend on and would serve to perpetuate the natural conditions in which their cultures evolved. However, should the population of a subsistence species decline, wilderness status would require a stronger justification for consideration of Intensive Management actions such as predator control. In recognizing the importance of Native and non-Native rural residents subsistence needs, ANILCA established a rural priority for the subsistence uses of fish and wildlife over other consumptive users in times of scarcity. These provisions are viewed favorably by subsistence users in helping to ensure continued subsistence opportunities on Federal lands.

Current methods and patterns of motorized and non-motorized access would not be affected. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Some subsistence users would view the wilderness overlay on their homeland as complementary to their cultural perspective; others would view wilderness as a foreign concept and at variance with their traditional beliefs. The subsistence user groups most affected by the Brooks Range and Porcupine WSA designations would be the south side Gwich'in communities of Arctic Village, Venetie, Fort Yukon, and Chalkyitsik.

A resolution adopted by the Gwich'in Nation at Arctic Village in 1988, and reaffirmed at biannual meetings since, continues to support wilderness review and designation for the Coastal Plain and for all Refuge lands not yet designated as wilderness. The resolution stresses the importance of protecting the land and traditional and customary ways of life for future generations. Alternative D would provide further long-term protection for a large portion of their traditional homelands in Arctic Refuge boundaries south of the Brooks Range, which would be viewed as a positive subsistence and cultural benefit. However, there would be no further protection for the Porcupine caribou herd's calving and nursery grounds on the Coastal Plain associated with the 1002 Area, which would be viewed as a negative effect for the Gwich'in people.

In the Brooks Range and Porcupine WSAs, there are 78 conveyed Native allotments, each 40–160 acres in size, for a total of 9,213 acres. The Native allotments were based upon past subsistence use, and the current and foreseeable subsistence related use is consistent with the Refuge and wilderness purposes. However, sales to private parties could potentially result in commercial or other development that could detract from the wild character and subsistence use of the immediate area. The Refuge would continue its policy of offering to purchase inholdings where the owners have decided to sell. If acquired, the Service would manage these lands in accordance with Refuge and ANILCA purposes, including the continued opportunity for subsistence use.

Alternative D recommends wild river designation for the Kongakut, Hulahula, Marsh Fork Canning, and Atigun Rivers. Only those portions of the Hulahula River on Refuge lands would be recommended for designation. The Hulahula River was identified as having ORV for cultural resources. If Congress were to designate any of the recommended rivers in this alternative, a CRMP would need to be developed for the rivers that would identify strategies to provide further protection for their outstanding values,

which might affect the commercial services, visitor services, cultural resources, local economies, recreational opportunities, and wilderness opportunities. There would be no effect to subsistence uses or resources. Traditional access and subsistence use opportunities would continue to be permitted according to current regulations and policies.

In general, subsistence uses in designated wilderness and wild river corridors would continue as they have under Minimal Management, and the subsistence purpose would continue to be met. Pathways of potential contaminants into water supplies and subsistence foods resources by human waste accumulation or fuel caches would be mitigated by ongoing management practices and current regulations. No new impacts to subsistence activities are expected to occur. However, there will continue to be a potential for trespass on Native allotments and Native corporation lands, as well as a potential for conflict with visitors and non-local users at important high use subsistence use areas. With current management stipulations and increased education and outreach to all users, the overall impact to cultural and subsistence resources and subsistence activities would likely be local, long-term, and minor in scale.

5.11.5 Effects of Alternative E

The general management stipulations stated in Alternative A would continue in Alternative E. This alternative would recommend the Brooks Range, Porcupine Plateau, and the Coastal Plain WSAs for wilderness designation. Wilderness designation would provide further long-term protection for the lands, wildlife, and other resources subsistence users depend on, and it would serve to perpetuate the natural conditions in which their cultures evolved. However, should the population of a subsistence species decline, wilderness status would require a stronger justification for consideration of Intensive Management actions such as predator control. In recognizing the importance of Native and non-Native rural residents subsistence needs, ANILCA established a rural priority for the subsistence uses of fish and wildlife over other consumptive users in times of scarcity. These provisions are viewed favorably by subsistence users in helping to ensure continued subsistence opportunities on Federal lands.

Current methods and patterns of motorized and non-motorized access would not be affected. The use of temporary structures such as tent camps, tent frames, and fish drying racks would continue. Subsistence use of cabins would continue, although requests for construction or location of new cabins would receive greater scrutiny. Some subsistence users would view the wilderness overlay on their homeland as complementary to their cultural perspective; others would view wilderness as a foreign concept and at variance with their traditional beliefs. In general, subsistence uses in wilderness would continue as they have under Minimal Management, and the subsistence purpose would continue to be met. The subsistence user groups most affected by this alternative would be the Iñupiat village of Kaktovik in the northern region and the Gwich'in communities of Arctic Village, Venetie, Fort Yukon, and Chalkyitsik to the south.

Including the Coastal Plain in the wilderness recommendations would be viewed as having a negative effect by Iñupiat Tribal leaders, the Arctic Slope Regional Corporation, Kaktovik Iñupiat Corporation, and some members of the Native community because it would impact future economic development opportunities such as oil and gas development in the 1002 Coastal Plain area. The Gwich'in Nation representatives recommend designation of the Coastal Plain as wilderness because of its importance for a variety of subsistence resources, including the calving and nursery grounds for the Porcupine caribou herd. They describe the

Refuge's Coastal Plain as a "Sacred Place Where Life Begins." The Gwich'in Nation resolution supports wilderness review and designation for the Coastal Plain and for all Refuge lands not yet designated as wilderness, stressing the importance of protecting the land, waters, and resources, and the traditional and customary ways of life for future generations. This alternative would have a positive effect for the Gwich'in people, providing the most long-term protection over the greatest portion of their traditional homelands in Arctic Refuge and helping to perpetuate the natural conditions and the subsistence resources so essential to the Gwich'in way of life. The Iñupiat leaders, while supporting continued protection of subsistence resources and subsistence use, view designation of the 1002 Coastal Plain area as wilderness as being detrimental to future economic development opportunities.

In the Brooks Range, Porcupine and Coastal Plain WSAs, there are 107 conveyed Native allotments, each 40–160 acres in size, for a total of 10,733 acres. The Native allotments were based upon past subsistence use, and the current and foreseeable subsistence related use is consistent with Refuge and wilderness purposes. However, sales to private parties could potentially result in commercial or other development that could detract from the wild character and subsistence use of the immediate area. The Refuge would continue its policy of offering to purchase inholdings where the owners have decided to sell. If acquired, the Service would manage these lands in accordance with Refuge and ANILCA purposes, including the continued opportunity for subsistence use.

Alternative E recommends wild river designation for the Kongakut, Hulahula, Marsh Fork, and Atigun Rivers. The Hulahula River was identified as having an outstanding remarkable cultural value, which could be viewed as a positive benefit for further long-term protection of its cultural resources. If Congress were to designate any of the recommended rivers in this alternative, a CRMP would need to be developed for the rivers that would identify strategies to protect their values, which might affect the commercial services, visitor services, cultural resources, local economies, recreational opportunities, and wilderness opportunities. There would be no effect to subsistence uses or resources. Traditional access and subsistence uses would continue to be permitted according to current regulations and policies.

In general, subsistence uses in designated wilderness and wild river corridors would continue as they have under Minimal Management, and the subsistence purpose would continue to be met. Pathways of potential contaminants into water supplies and subsistence foods resources by human waste accumulation or fuel caches would be mitigated by ongoing management practices and current regulations. No new impacts to subsistence activities are expected to occur. However, there will continue to be a potential for trespass on Native allotments and Native corporation lands, as well as a potential for conflict with visitors and non-local users at important high use subsistence use areas. With current management stipulations and increased education and outreach to all users, the overall impact to cultural and subsistence resources and subsistence activities would likely be local, long-term, and minor in scale.

This alternative does not impose any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. This alternative does not include health risks and other impacts for people who rely principally on fish or wildlife for subsistence.

5.11.6 Effects of Alternative F

The general management stipulations stated in Alternative A would continue in Alternative F. No new areas would be recommended for wilderness designation, and no new wild rivers would be recommended for designation. Alternative F would recommend monitoring

Kongakut visitor use and preparing public educational materials on topics such as preferred practices and strategies for minimizing impacts, including proper waste disposal practices, avoiding wildlife impacts, and alleviating crowding among user groups. A step-down visitor use management plan would be initiated within two years. More proactive management of commercial and visitor use, including recreational and commercially guided hunting, would be beneficial to subsistence users and would potentially minimize conflicts and competition for subsistence related resources.

In general, subsistence uses would continue as they have under Minimal Management, and the Refuge's subsistence purpose would continue to be met. Pathways of potential contaminants into water supplies and subsistence foods resources by human waste accumulation or fuel caches would be mitigated by ongoing management practices and current regulations. No new impacts to subsistence activities are expected to occur. However, there will continue to be a potential for trespass on Native allotments and Native corporation lands, and a potential for conflict with visitors and non-local users at important high use subsistence use areas. With current management stipulations and increased education and outreach to all users, overall impacts to cultural and subsistence resources and subsistence activities would likely be local, long-term, and minor in scale.

5.11.7 Conclusion

Neither current management, nor any of the actions proposed in alternatives B–F, would significantly affect subsistence resources, subsistence access, or subsistence use. These alternatives do not impose any disproportionately high or adverse human health or environmental effects on minority or low-income populations. This analysis does not include a health risk assessment for people who rely principally on subsistence resources.



5.12 Irreversible and Irretrievable Commitment of Resources

An irreversible commitment of resources is defined as the loss of future options. While irretrievable commitments represent the loss of wildlife and habitat, visitor uses and experiences, or economic opportunities, they can be retrieved over time. An irreversible commitment is lost forever.

Most of the actions proposed in all of the alternatives would not constitute irreversible and irretrievable commitments of resources. In alternatives C and E, there is a recommendation for Coastal Plain WSA to be designated wilderness. If wilderness were to be designated by Congress, there would be an irreversible and irretrievable loss of potential oil and gas production, and its attendant impacts. However, as Congress can designate wilderness, it can also revoke designation.

5.13 Relationship Between Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

Based on current management (Alternative A) and alternatives B–F, the Refuge would be managed for its four ANILCA purposes and the Range's original purpose of preserving unique wildlife, wilderness, and recreational values. Alternatives B–E recommend designating progressively more wilderness and wild rivers, ensuring long-term preservation of lands in the Refuge through statutory protections. Effects to the biophysical and human environments would be minor over the planning period of this Revised Plan.

Alternatives C and E propose designating the Coastal Plain as wilderness. This would enhance the long-term productivity of Refuge lands for the purposes for which the Refuge was established. However, designation would result in precluding future oil and gas development and its attendant impacts. As Congress can designate wilderness, it can also revoke designation.

5.14 Unavoidable Adverse Effects

Management actions proposed in alternatives A–F would not result in any unavoidable adverse effects. Designation of wilderness and wild river designation would enhance the Refuge's purposes. More proactively managing the Kongakut River would produce no unavoidable adverse effects.

Alternatives C and E propose designating the Coastal Plain as wilderness. This designation would result in precluding future oil and gas development and its attendant impacts. As Congress can designate wilderness, it can also revoke designation.

