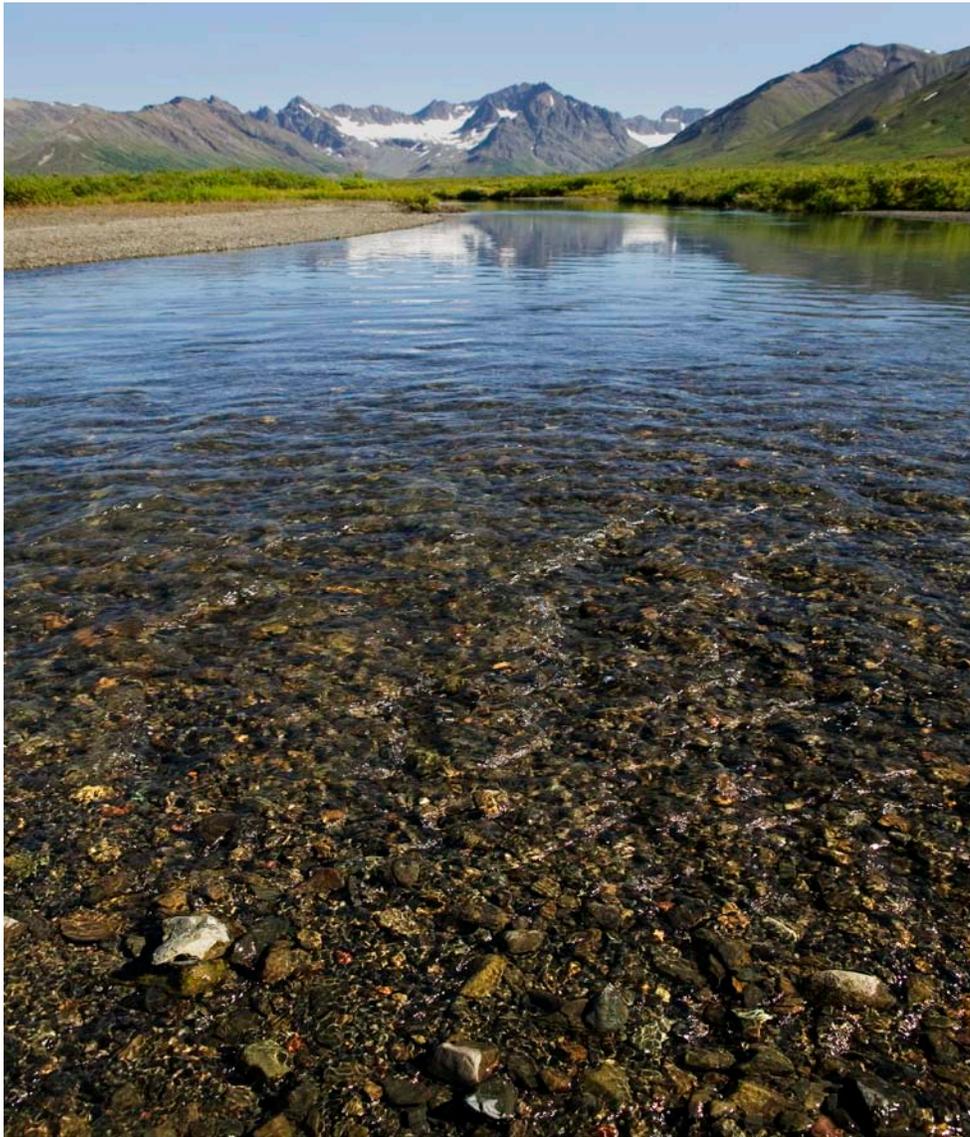




U.S. Fish & Wildlife Service

Togiak National Wildlife Refuge

Public Use Management Plan Revision And Environmental Assessment



May 2010



U.S. Fish and Wildlife Service Mission Statement

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.



Refuge Mission Statement

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

—National Wildlife Refuge System Improvement Act of 1997

**U. S. Department of the Interior
Fish and Wildlife Service
Region 7, Alaska**

FINDING OF NO SIGNIFICANT IMPACT

**Public Use Management Plan Revision
Togiak National Wildlife Refuge, Alaska**

The U.S. Fish and Wildlife Service (Service) has completed the Revisions to the Public Use Management Plan (PUMP) for the Togiak National Wildlife Refuge. The revisions and Environmental Assessment (EA) (herein incorporated by reference) describe the five alternatives for addressing four issues associated with managing public use on the Refuge and the effects of those alternatives on the human environment. No substantive changes in the preferred alternative, Alternative C, were made in response to public comments. Alternative C was selected for implementation.

Alternatives Considered

Five alternatives were considered in the environmental assessment. Each alternative addressed the issues identified during scoping: public use at Cape Peirce Wildlife Viewing Area; unguided recreational opportunities in the Kanektok and Goodnews River watersheds; waste management; and commercial sport fishing in the Goodnews, Togiak, Osviak and Matogak river watersheds. Alternative A, the no action alternative, would continue management according to the Togiak National Wildlife Refuge Public Use Management Plan published in 1991 and its amendments. The range of action alternatives includes a variety of management approaches, levels of use, and facilities which address the identified issues.

Public Review

Public comments on the draft plan and EA were solicited from September 27, 2007, through January 18, 2008. During the public comment period meetings were held in Anchorage, Quinhagak, Goodnews Bay, Togiak and Dillingham.

Revisions from Draft Plan

Only technical corrections and edits to alternatives, including Alternative C, the preferred alternative, were made as a result of the public comments on the Draft Revised Togiak Plan. Additional information and analysis were provided in response to comments.

Analysis of Impacts

The EA analyzed direct, indirect, and cumulative impacts on refuge resources including fish and wildlife and wilderness values, as well as refuge purposes, subsistence opportunity, wildlife dependent recreation, local users, visitor experiences, cultural resources, and the local economy. The EA included an ANILCA Section 810 subsistence evaluation and finds the proposed action would not result in significant restrictions of subsistence opportunity. No significant effects were identified in the analysis.

Conclusions

Based on review and evaluation of the information contained in the EA and plan revision, I find that Alternative C, the preferred alternative, provides a realistic balance between public use of the Refuge and the conservation needs of the Refuge. It best accomplishes refuge purposes, and best supports the missions of the National Wildlife Refuge System and the Service. It provides long-term protection of fish and wildlife populations and their habitats, and the wilderness values of the Togiak Wilderness Area, while allowing appropriate levels of fish and wildlife-dependent recreation, interpretation and environmental education, subsistence, and other public uses.

I have determined that there will be no significant individual or cumulative impacts to the human environment, within the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. I have determined that the activities prescribed in this plan are not major Federal actions. Accordingly, the Service is not required to prepare an environmental impact statement.



Geoffrey L. Haskett
Regional Director

9/21/10

Date

1. Purpose and Need for Action

1.1 Introduction

This is the environmental assessment for the Togiak National Wildlife Refuge Public Use Management Plan Revision. The plan directs management of public use for the 4,786,965 acre Togiak National Wildlife Refuge (NWR), and the 73,890 acre Hagemeister Island portion of Alaska Maritime Refuge located in southwestern Alaska.

In 1991, the Public Use Management Plan (PUMP) for the Togiak Refuge was completed and the Refuge began implementation. Since that time, several studies have been completed, data have been collected, wildlife populations have changed, and public use of the Refuge has changed.

The Public Use Management Plan states that every three to five years, Refuge staff should formally evaluate the plan to determine if changes are needed. The plan also states that when non-guided recreational fishing use approaches or exceeds the level of authorized guided use, an analysis is to be conducted to determine if further regulation of non-guided use is needed. Since the plan was completed, non-guided use has increased and has reached or exceeded the level of authorized guided use on the Kanektok and Goodnews rivers. The 1991 plan also allows the existing level of guided recreational fishing to continue on the Upper Goodnews River. Allocation of additional guided recreational fishing use for the river was deferred until additional resource and use data could be acquired. The refuge staff has since gathered new data on Refuge public use and natural resources and believes that additional use should be considered.

The revised Public Use Management Plan will integrate the existing management direction with the updates made through this process. It will serve as a management plan for public use on the Refuge for 5-10 years or until an action or event occurs that would require the Plan to be revised. The plan may be modified as changes occur, and other more specific plans will be written to address specific resources and uses of the Refuge. It represents the combined effort and input of the State of Alaska, local residents, the visiting public, and U.S. Fish and Wildlife Service (Service) staff.

1.2 Purpose

The purpose this plan revision is to update and augment management direction provided in the Togiak National Wildlife Refuge Public Use Management Plan originally published in 1991 and its amendments.

The revised PUMP should support the refuge vision and goals stated in the revised Comprehensive Conservation Plan; and support the purposes of the refuge while also allowing the public to experience the refuge with its unique resources. Within the Togiak Wilderness, management of public use should endeavor to preserve the wilderness character of the area, while continuing to allow traditional uses and accrss that have been provided for in the Alaska National Interest Lands Conservation Act (ANILCA).

1.3 Need for Action

There are four needs for action:

- To establish management emphasis, level of visitation, permit allocation method, and appropriate types of facilities for the Cape Peirce Wildlife Viewing Area;
- To establish a program for achieving levels of unguided recreational visitation on the Kanektok and Goodnews rivers within the Refuge in keeping with the threshold established in the 1991 PUMP which will maintain the wilderness attributes of solitude, naturalness, and the opportunity for a primitive and unconfined recreation experience;
- To identify options and choose an approach to managing the disposal of solid human waste along high use rivers on Togiak Refuge;
- To re-evaluate and identify any additional opportunities for commercial recreational fish guiding on the Goodnews, Osviak, Matogak, and Togiak rivers which will take into consideration resource impacts, private land considerations, and conflicts with other users, for which there is a demonstrated interest by commercial operators.
- To establish management direction for FWS managed lands within PUMP Unit 1.

1.4 Refuge Purposes, Vision, and Goals

Refuge Purposes

The portion of the Refuge designated as the Cape Newenham National Wildlife Refuge in 1969 was given the broad purpose “. . . for the protection of wildlife and their habitat . . .” Public Land Order 4583, dated Jan. 23, 1969. In addition, Sections 303(1)(B) and 303(6)(B) of the Alaska National Interest Lands Conservation Act (ANILCA) set forth the purposes for which Alaska Maritime and Togiak Refuge (including the former Cape Newenham Refuge) were established and shall be managed, including the following:

(i) To conserve fish and wildlife populations and habitats in their natural diversity, including the following: [Togiak Refuge] salmonids, marine birds and mammals, migratory birds, and large mammals (including their restoration to historic levels)

[Alaska Maritime Refuge-Hagemeister Island] marine mammals, marine birds and other migratory birds, the marine resources upon which they rely, bears, caribou, and other mammals

(ii) To fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats

(iii) To provide, in a manner consistent with purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents

[(iv) Alaska Maritime Refuge-Hagemeister Island] To provide, in a manner consistent with subparagraphs (i) and (ii), a program of national and international scientific research on marine resources

[(iv) Togiak Refuge; (v) Alaska Maritime Refuge [Hagemeister Island] To ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the Refuge

The Wilderness Act of 1964 (Public Law 88-577) creates additional purposes for designated wilderness areas within refuge boundaries. These areas are to be managed “for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.”

1.4.1 Refuge Vision Statement

With the help of cooperators and partners, the Refuge will continue to be part of a healthy functioning ecosystem where fish and wildlife populations and their habitats exist in an environment primarily affected by the forces of nature. Current and future generations will have opportunities to participate in a variety of fish- and wildlife-dependant activities that emphasize self-reliance, solitude, and a close relationship with the environment. The public will gain an understanding of the Refuge on natural, cultural, and scientific levels to appreciate the importance of its protection and preservation for future generations.

1.4.2 Refuge Goals

Goals are broad descriptive statements of desired future conditions that convey a purpose but do not define measurable units. Goals for the Refuge will direct work at carrying out its mandates and achieving the purposes defined by ANILCA and the Wilderness Act.

The Refuge developed the following goals to guide management toward meeting the vision statement and purposes of the Refuge. Objectives to help meet the goals are outlined in Section 2.2 of the Comprehensive Plan.

Goal 1. Increase our knowledge of refuge resources to support management decisions and maintain the health and integrity of native ecosystems.

Goal 2. Provide quality fish and wildlife oriented recreation, subsistence, interpretive, and educational opportunities that promote stewardship of southwest Alaska wildlife and their habitats.

Goal 3. Protect the natural and cultural resources of the Refuge to ensure their integrity.

Goal 4. Maintain the wilderness character of the Togiak Wilderness Area.

Goal 5. Develop and maintain support mechanisms and infrastructure to achieve management goals.

Goal 6. Maintain a leadership role in the management of [native] natural ecosystems in southwest Alaska.

1.5 State of Alaska Coordination

The Alaska Department of Fish and Game (ADF&G) has the responsibility for managing resident fish and wildlife populations in Alaska. On refuge lands, the Service and ADF&G share the responsibility for conservation of fish and wildlife resources and their habitats, and both are engaged in extensive fish and wildlife conservation, management, and protection programs. In 1982, the Fish and Wildlife Service and ADF&G signed a Master Memorandum of Understanding that defines the cooperative management roles of each agency (see Appendix C of the Togiak Comprehensive Conservation Plan, USFWS 2009). This memorandum sets the framework for cooperation between the two agencies.

The Alaska Department of Natural Resources (DNR) and its subdivisions are also key management partners. DNR manages all state-owned land, water, and surface and subsurface resources except for fish and game. The DNR Division of Mining, Land, and Water manages the state's water and submerged land interests within the Refuge. The Department of Natural Resources developed a Special Use Land Designation (SULD) for "*State of Alaska shorelands and waters within the Togiak National Wildlife Refuge and lower Goodnews River.*" (Appendix A and USFWS 2009).

1.6 The Planning Process

The process used to develop the PUMP and this environmental assessment is consistent with the planning requirements in the National Wildlife Refuge System Administration Act (1966), as amended; the Service's planning policy (602 FW 1); National Environmental Policy Act (42 U.S.C.4321-4347); and the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508).

In 1994, Togiak Refuge began to revise its Public Use Management Plan. The Refuge staff had not yet released a draft revised public use plan when they began to review their Comprehensive Plan in advance of its revision. To minimize the impact of two separate planning efforts, the Service chose to combine those efforts. This document is the result of that combined effort. A full description of the planning process used can be found in section 1.7 of the Togiak Comprehensive Conservation Plan (USFWS 2009).

Issues addressed in this plan revision were identified through a review of the 1991 Public Use Management Plan in conjunction with responses to planning updates, public meetings, and the input of core planning team members.

1.7 Issues Considered But Not Addressed in the Alternatives

Much of the plan revision is focused upon important issues raised through written and verbal comments from local, tribal, and state governments, the general public, and Service staff. As part of the planning process, we mailed public newsletters, administered surveys, held public meetings, held planning meetings with local and state government representatives, and incorporated a number of comments from responses to planning newsletters, surveys, and public meetings from as far back as 1994.

Through the course of all those meetings, surveys, and correspondence, certain important issues have been identified that will not be addressed in this plan. This may be because the issue is addressed by existing laws, regulations, policies or management actions, the issue is or will be addressed in the same manner regardless of alternative selected, or the issue is outside of the scope of this planning effort.

Following is a brief discussion of issues that will not be addressed in this plan including the reasons for not including them.

1.7.1 *Health of Fish and Fish Populations*

The salmon of Bristol and Kuskokwim bays are the single most important resource in the area. The income and food that salmon provide are critical to the livelihoods of almost everyone in the region. Because of the importance of these fisheries, they are monitored, sampled, and studied by federal and state agencies to ensure that they continue to provide for the communities near the Togiak Refuge. Of the hundreds of thousands of salmon that return to rivers within the Togiak Refuge every year, only a few thousand are caught or taken by recreational anglers and local residents. The vast majority of the harvest is taken by commercial permit. It is unlikely that current or future levels of recreational or subsistence harvest will affect salmon stocks within the Togiak Refuge.

Concerns have been raised about disturbance to spawning and rearing habitats from wading anglers and jetboats. Research on wading has found variable effects, and studies of motorboat use effects on fish habitat in Alaska have not found effects large enough to warrant regulation on those rivers. Kicking up eggs to attract fish does not appear to be a problem on these rivers compared to some locations in the nation. Bank erosion from angler trampling appears minimal because most angling takes place on gravel bars. Many rivers are already seasonally closed to recreational fishing for king salmon to protect spawning fish. For example, the Kanektok is closed for kings after July 25. The State does have the authority to close an area to fishing under some circumstances. Since studies have not demonstrated clear relationships between wading, jetboats and health of fish; steamside habitats appear to be in good condition; and methods and means of take are set by the Alaska Board of Fish, these topics are considered to be outside the scope of this plan.

Another facet of this issue is the risk of disease introduced from other regions. Anglers from around the country and the world travel to Alaska and often fish in the remote waters wearing the same clothing, especially waders, that they may have used in other waters where infectious disease occurs. Transportation of disease, aquatic vegetation, and aquatic organisms has occurred in other areas of the country. The Service's Fishery Resource Office, now part of the Anchorage Fish and Wildlife Field Office, collected tissue samples from ten rainbow trout populations, two Dolly Varden populations, and one arctic char population throughout southwest Alaska during 1998 to test for specific diseases and parasites. Rainbow trout were collected from the Kanektok and Togiak river drainages. Dolly Varden and arctic char were collected from the Togiak drainage. All tests for *Myxobolus cerebralis* (whirling disease) were negative. Other bacterial pathogens tested for were all found at or below normal levels or were nonexistent. Rainbow trout that spawn in cold water temperatures are less susceptible to the detrimental effects of whirling disease. Information about appropriate gear care and disease transmission is provided to Refuge visitors. Current management actions and monitoring appear to be adequate to minimize the risk of disease transmission and will be continued regardless of alternative chosen; therefore, this is not considered a significant issue for this plan.

Other concerns are related to the effect catch-and-release fishing may have on rainbow trout. Many local community members view this common form of angling as disrespectful and inappropriate. Local anglers dislike catching fish that have been previously caught and feel that the quality of the meat is diminished. This long-standing issue is broader than a concern over the health of fish stocks; it is clearly also an issue grounded in cultural values. In the context of this issue (health of fish), we will only address the mortality aspect. Angler education has been recognized by both ADF&G and Service managers as the best method to

successfully implement catch-and-release fishing and minimize mortality. Education of anglers by Togiak Refuge personnel is initiated during airport contacts for unguided floater trips and by the Togiak Refuge ranger program contacting groups in the field. Information is sent to interested parties inquiring about the Refuge. Permitted guides on the refuge are required to brief all clients on proper catch and release methods. Information provided to visitors also includes the sensitivity of catch-and-release practices to local residents.

Several comments suggested changes in fishing seasons, harvest limits, or methods of harvest. The Alaska Board of Fisheries, not the USFWS, regulates all methods and means of recreational and commercial fishing in all state waters, including waters within the Refuge; thus, these issues and suggestions are outside the scope of this Plan and will not be considered. However, the Togiak Refuge will continue to work closely with ADF&G to address these important issues and concerns.

1.7.2 *Public-Use Impacts on Wildlife*

During scoping, concerns were raised about the effect that visitors and their activities have on wildlife within the Refuge. If food, fish or game carcasses, and garbage are not properly cared for and disposed of, bears and other wildlife may learn to associate people with a source of food. Bears can also become habituated to human activities. Food conditioning and human habituation can increase the likelihood for encounters. Such encounters have the potential for human injury and for bears being killed. These types of negative encounters are very rare; to our knowledge, no one has ever been injured by a bear in the Refuge.

Displacement is another possible effect of increasing public use in wildland areas. Some animals do not adapt to increased frequency in boating, hiking, snowmobiling, or other activities; as a result, animals may avoid the areas where these activities occur. The primary concern is that wildlife such as bears and moose will move away from important riparian habitats during the summer and fall when public use is highest. This could affect the availability of animals for subsistence hunters as well as the health of individual animals.

There is no indication that wildlife populations have been affected by the increased presence of humans along river corridors or that subsistence hunters are having decreased success. Under all alternatives, additional information will be gathered to more clearly understand the relationship between public use and wildlife displacement within the Refuge.

1.7.3 *Public Safety and Visitor Conflicts*

The issue of motorboat safety continues to be of concern to many people who visit, work, or live in the Refuge and surrounding areas. The use of motorized boats along rivers within the Refuge including the Togiak Wilderness Area is a traditional method of access. Along certain portions of these rivers, the normal rules of navigation are not always possible. Jet-powered boats must maintain a certain minimum speed to safely negotiate sharp bends and shallow water. Some river sections are narrow, and visibility is often limited by tall grass or brush. As a result, both motorboats and rafts sometimes find themselves in hazardous situations that can result in serious injury.

The Service has no management authority over boating safety of the general public on navigable waterways. Commercial visitor services providers operating on the refuge are evaluated for their safety record and policies. The Refuge is willing to work with partners to improve boating safety in the area.

1.7.4 Environmental Contaminants

During the planning process, concerns were raised about the impact of heavy metals, PCBs, and other contaminants from abandoned mining claims, existing mining operations, and the U.S. Air Force long-range radar installation at Cape Newenham. This issue is being addressed through a separate process. A contaminants assessment for the Refuge was completed in 2004 as part of a National program to summarize contaminants issues on all National Wildlife Refuges. Two major sources of contamination were identified by this assessment on the Togiak National Wildlife Refuge: Snow Gulch Mine site and Cape Newenham Long Range Radar site. Final Snow Gulch cleanup took place in Spring 2007. The Service continues to monitor actions by the Air Force to address contamination at Cape Newenham.

The Service will continue to work with private landowners, the State of Alaska, and the Air Force to monitor mitigation, site remediation, or contaminant containment measures currently in place and to address future contaminant issues as they are discovered.

1.7.5 Water quality

Local residents have expressed concerns about impacts to water quality in the rivers from improper disposal of human waste by recreational visitors. The rivers serve as the primary source of drinking water for locals. This is of particular concern along the Kanektok River, where recreational use is the highest.

To address this concern appropriately, the Service conducted a water quality study in 2001 on the Kanektok River at the wilderness Area boundary. Results from these samples indicate that *E. coli* levels are very low and are at or below levels that occur in river systems with little or no human use (Collins 2001 [unpublished]). The low levels of contamination indicate that water quality within the jurisdiction of the Service does not require additional action at this time. Other concerns associated with human waste disposal (aesthetics, trespass) are dealt with separately. See Section 2.4 Actions Common to all Action Alternatives.

1.7.6 Camping Opportunities on State Lands

The State of Alaska allows camping for three consecutive days at one location on Special Use Lands within the Togiak Refuge and along the Goodnews River. Public comments have suggested the length of stay be adjusted on State lands along that portion of the Kanektok River outside the Togiak Wilderness Area. This issue is the responsibility of the State of Alaska, Department on Natural Resources. State management direction is presented in Appendix A.

1.8 Planning Issues Addressed in the Plan

“Significant” planning issues are those that the Service has the authority to address and that are addressed in the alternatives presented in this environmental assessment. Each of the significant issues identified through this planning process is presented in this environmental assessment with alternative actions to address each one. Following is a brief summary of the significant issues and concerns raised during the planning process. Alternative ways of addressing these issues are discussed in chapter 2.

1.8.1 Issue 1. Public Use within Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake

Cape Peirce was designated as a wildlife viewing area in the 1991 PUMP to protect the marine mammals, marine birds, raptors, migratory waterfowl and their habitats while providing continued opportunities for subsistence and recreational use. This designation was a result of increasing visitation to the site to observe hauled-out walrus.

The 1991 PUMP recommends that visitation within the viewing area be limited to no more than six people at one time through a first-come, first-served permit system in place from May 1 to November 30. At those times when either Pacific walrus are hauled out at Maggy Beach or seals are hauled out on sandbars in Nanvak Bay, boat and aircraft landings on the beaches would likely disturb these marine mammals in violation of the Marine Mammal Protection Act. At those times aircraft would be encouraged to land just outside the wildlife-viewing area at Sangor Lake or at the far northern end of Nanvak Bay. There are also a number of conditions as part of special-use permits that minimize other potential wildlife-viewing disturbances.

Regulations to implement and enforce the permit program were not promulgated, although an informal permit program was in place for several years. At the current time, as a result of low numbers of walrus hauling out at the site and thus, lower visitation, no permits are required to enter the Wildlife Viewing Area. Under the 1991 guidance, permits were to be issued on a first-come, first-served basis with no separate allocation between wildlife-viewing guides, air-taxi operators, and the general public. This system could result in one group dominating the available permits. A more equitable way to allocate these permits is of concern to business operators, the general public and the Refuge. Also, some have suggested that the number of allowed visitors could increase and some facilities could be constructed with proper regulation and supervision. This is a significant issue for the Public Use Management Plan. Resource based factors that should be considered include wildlife disturbance, campsite conditions, and trail conditions. Social factors that should be considered include permit availability, camping conditions, and party size.

1.8.2 Issue 2 Unguided Recreational Opportunities in the Kanektok and Goodnews River Watersheds

Current levels of recreational fishing and hunting are compatible with the purposes of the Refuge, but concerns have been raised that increasing visitation may reduce opportunities for solitude and naturalness within the Togiak Wilderness Area. Preserving opportunities for solitude or a primitive and unconfined recreational experience in a natural setting is a key supplemental purpose for the Togiak Wilderness. Local residents are concerned that areas traditionally used for subsistence hunting and fishing are increasingly used by recreational anglers and may be unavailable for their use. The plan should consider actions which may be useful in maintaining these opportunities and achieving recreation management goals already established for the area.

The Togiak Refuge has taken steps to ensure wilderness solitude, naturalness, and quality visitor experience by increasing visitor outreach and education efforts and by regulating the amount of guided recreational fishing that occurs within the Togiak Wilderness Area and on other lands administered by the Refuge. However, concerns remain that these efforts are not adequate and that controls on unguided recreational uses should be considered.

1.8.3 Issue 3. Waste Management

Concerns have been expressed for many years about the disposal of human waste. It is illegal for people to dispose of feces by depositing it in the water or on land within 100 feet of surface waters. Disposal is currently allowed on Service managed uplands, but where the uplands are privately owned, permission (usually in the form of a permit) is required to avoid trespass. The illegal disposal of human waste along the shoreline and improper disposal on uplands results in visual impacts for all visitors. People are offended by seeing human waste and/or toilet paper along rivers within the Refuge. Approaches to minimizing the visual impacts of human waste disposal on federal lands should be considered in the plan.

1.8.4 Issue 4. Commercial Recreational Fishing in the Goodnews, Togiak, Osviak and Matogak River Watersheds

The Refuge has a system of exclusive commercial recreational fishing guide use areas that has been in place since adoption of the 1991 PUMP. The suggestion was made that additional opportunities on the Goodnews and Togiak rivers may be desirable. The Osviak and Matogak rivers were considered for commercial guiding opportunities in the 1991 PUMP. At that time, the Service decided not to offer guiding opportunities on those rivers. The State of Alaska has asked that the Service reconsider offering guiding opportunities on coastal rivers (e.g., the Matogak and Osviak rivers).

2 Management Direction and Alternatives

2.1 Process Used to Develop These Alternatives

The alternatives described in this chapter are different ways of addressing the significant issues identified during the planning process. As discussed in chapter 1, issues addressed in this plan revision were identified through a review of the 1991 Public Use Management Plan in conjunction with responses to planning updates, public meetings, and the input of core planning team members. The core planning team included representatives of local tribes and the State of Alaska along with Togiak Refuge staff. The core planning team developed five alternative approaches to revising the 1991 Public Use Management Plan. The alternatives were designed to meet Refuge goals, respond to identified issues, and encompass a range of options for addressing each issue. Each alternative is responsive to numerous laws and regulations governing management of the National Wildlife Refuge System and to the mission and goals of the Service and the Refuge System and the purposes for which Togiak Refuge was established.

2.2 Alternatives Considered but Eliminated from Detailed Consideration

Suggestions for possible alternatives were received during the planning process. Most of these suggestions are incorporated into the five public use alternatives and into the elements common to all alternatives. Some actions, however, were considered but not included in the alternatives under consideration for a number of reasons.

Several people suggested the construction of outhouses or temporary waste facilities at strategic points along major rivers within Togiak Refuge. In certain river environments, this can be an effective management tool for waste-disposal. This is not feasible along rivers in the Togiak Refuge because of their remote wilderness location, a very limited number of sites suitable for waste facilities, and other impacts commonly associated with the development of facilities and structures in wilderness recreational settings (e.g., the creation of concentrated use around facilities, competition for campsites near facilities, and vegetation impacts that result from the development and use of facilities).

Several suggested reducing the number of float trips on the Kanektok River to less than three per week to address wilderness stewardship, subsistence opportunity, waste management, trespass, crowding, and competition for fishing sites. Based on available information, this suggestion would result in a reduction of 75 to 80 percent from current levels, which we believe is not necessary at this time and would unnecessarily restrict visitors to the refuge.

Another suggestion was to allow guided recreational fishing on most or all rivers within the Refuge. Legislation and Service policy allow commercial use of refuges only if they contribute to the achievement of the Refuge purposes defined by ANILCA and only in the Togiak Wilderness as necessary for realizing the recreational and other wilderness purposes for which the area was established. Currently, guided recreational fishing is allowed at 25 wilderness lakes, along three major rivers, and along one smaller river within the Refuge.

Additional guided recreational fishing opportunities could be allowed when there is a demonstrated need by the public and when that commercial use is compatible with and contributes to the purposes of the Refuge. The Service believes that this alternative is not necessary to provide an adequate range of opportunities at this time.

2.3 Public Use Management Direction Not Altered by this Plan

The 1991 Togiak Public Use Management Plan established 14 geographic planning units and provided management direction for 10 of those units. This section briefly describes the management direction established in the 1991 plan. All actions, management direction, and guidance in the 1991 Public Use Management Plan including any amendments, supplements, and previous revisions, will remain in effect unless specifically altered by this revision.

Table 2-1 General Management Direction from the 1991 Togiak Public Use Management Plan¹

Unit No.	Unit Name	Management Direction
2	Kulukak River	Protect and maintain habitat for anadromous fish runs.
3	Negukthlik/ Ungalikthluk Rivers	Protect and maintain fishery habitat to protect anadromous fish runs and resident fish populations.
5	Upper Togiak River (designated wilderness)	Wilderness management emphasis on maintaining subsistence opportunities, high quality recreational opportunities, wilderness values, and wild fishery stocks.
6	Three Rivers (Osviak, Matogak, and Quigmy)	Protect and maintain habitat for anadromous fish runs. Emphasis on maintaining subsistence opportunities.
7	Cape Peirce/Cape Newenham	Cape Peirce Wildlife Viewing Area established. Recreational use and access will be limited. Visitor use will not be limited in the remainder of Unit 7.
9	Upper Kanektok River (designated wilderness)	Wilderness management emphasis on maintaining subsistence opportunities, high quality recreational opportunities, wilderness values, and wild fishery stocks.
10	Arolik River System	No guided recreational fishing opportunities will be offered on refuge lands in this unit.
12	Upper Goodnews River (designated wilderness)	Wilderness management emphasis on maintaining subsistence opportunities, high quality recreational opportunities, wilderness values, and wild fishery stocks.
13a & 13b	Refuge Lakes (designated wilderness)	Wilderness management emphasis on maintaining subsistence opportunities, high quality recreational opportunities, wilderness values, and wild fishery stocks.

¹Refuge management direction was not established for Units 1, 4, 8, and 11.

Figure 2-1 shows the planning units within the refuge. Planning Units 13A and 13B overlay several other units within the Togiak Wilderness Area and apply to headwater lakes only. Table 2-1 summarizes the specific management direction for the planning units that include federal lands. No management direction was stated for Unit 1 Igushik/Snake Rivers. Proposed management direction for that unit is included in section 2.4. Actions Common to All Action Alternatives. Planning units 4, 8, and 11 include only lands not managed by the Refuge. Full descriptions of the units and management direction can be found in the 1991 Togiak Public Use Management Plan. This includes the management of commercially guided recreational fishing permits. The number of commercially guided recreational fishing permits for the Kanektok River, Kulukak River, and Wilderness Lakes will not change as a result of any alternatives in this Plan. Permits will be re-offered on a competitive basis for 10-year periods. Permits are issued for five years with a non-competitive renewal for an additional five years upon showing compliance with all permit conditions.

21 Actions Common to All Action Alternatives

The actions discussed below will be implemented regardless of the alternative selected.

21.1 *Public Use Monitoring Plan*

As part of all alternatives for managing public use, the Refuge will develop a step-down plan that describes the implementation of decisions made in this planning process. Included in this plan will be guidelines for monitoring public use in the future. This plan will be developed through an open process involving both the public and the State of Alaska. Through this step-down plan, the Service will select important indicators of public use, resources, and wilderness experiences. The plan will then establish acceptable standards for these indicators and outline management actions that will be taken should these standards be threatened or exceeded. This plan will also include a water quality monitoring program using Clean Water Act standards.

21.2 *Human Waste Management*

Human waste management was considered a significant issue in the draft Public Use Management Plan Revision. In recent years technology for safe handling of human waste in outdoor environments has improved. When properly handled, human waste can now be deposited in a landfill and no longer requires special facilities. We propose to implement these actions regardless of the alternative chosen: Improve education of visitors to the Togiak Refuge about waste disposal issues and nationally recognized “Leave-No-Trace” camping practices; increase work with the Alaska Department of Environmental Conservation and with local communities and other land owners to improve education and enforcement of existing laws and regulations regarding waste disposal; establish a human waste disposal monitoring program with defined standards for aesthetics (visual impacts of deposited human waste on refuge land; establish a monitoring program to assess the impact of public use levels on water quality; continue to maintain public outhouses currently provided at Kagati and Goodnews lakes. These structures minimize potential impacts to water quality, cultural resources, and aesthetics that could be caused by public use at these two high use sites. Monitoring programs for water quality and for aesthetics would be developed as part of the Public Use Monitoring Plan described earlier in this chapter.

21.3 *Camping Opportunities on State Lands within the Togiak Refuge Boundary and along the lower Goodnews River*

The 1991 Togiak Refuge Final Public Use Management Plan proposed camping limits on Refuge lands within one-quarter mile of the Kanektok, Goodnews and Togiak rivers and at the outlet of

Kagati Lake to minimize impacts to the refuge. Regulations have not been promulgated to implement this action. Under all alternatives, the Refuge will follow procedures under 50 CFR 36.42 to implement the 1991 proposed camping regulation to bring it into alignment with the State of Alaska SULD (see Appendix A). Under this regulation, public camping will be limited to three consecutive nights at one location within one-quarter mile of the Kanektok and Goodnews rivers, and one night within one-quarter mile of the Kagati Lake outlet on Refuge lands, after which time camps must be moved a minimum of two miles. Maintaining consistent regulations for the length of the river will eliminate confusion for users.

Togiak Refuge will continue to provide public information regarding the DNR camping limits on state lands within the refuge boundary and along the lower Goodnews River. In an effort to reduce trespass violations, Togiak Refuge will continue to relay information about the use of private lands to the land owner, manager, or entity with trust responsibility.

2.1.4 Management Direction for Unit 1 Igushik/Snake Rivers.

Management direction for Unit 1 Igushik/Snake Rivers was not established in the 1991 Togiak Public Use Management Plan. As a part of this revision, management direction for FWS managed lands in this unit will be as follows:

Proposed Management

Management of the unit will be directed toward protecting and maintaining habitat for the anadromous fish runs and resident species. Protection and maintenance of wild fishery resources is the fishery management concept adopted in the Refuge Fishery Management Plan. Emphasis will be placed on maintaining subsistence opportunities.

Guided Sport Fishing Use

The lands and waters managed by the Togiak Refuge within this unit provide very limited opportunities for sport fishing. The only portion of the unit that has been actively used for sport fishing includes the Lower Ongoke River between Ualik and Amanka Lakes, all of which is surrounded by Manokotak Village Corporation lands. Based on land ownership, access difficulties, and lack of demonstrated demand, no guided sport fishing use will be authorized at this time.

Other Commercial Use

No requests have been made for set net fishing sites. Future applications would be handled on a case-by-case basis. A limited number of flights are made each year by permitted air taxi companies to transport campers and beach-combers down to the Nushagak Peninsula. Occasionally, commercial waterfowl hunting takes place on the lower Nushagak Peninsula. No other commercial activities have been documented or are anticipated.

Figure 2-1.
Public Use Management Plan Units



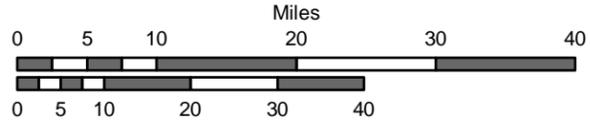
Togiak National Wildlife Refuge

- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Other refuge lands

- | | |
|---|-----------------------------------|
| Private | Other Public Land Managers |
| Native Private Fee | Other Federal |
| Native Private Selected | State Patent or TA |
| Other Private | |
| Regional Corporation Selected (subsurface only) | |

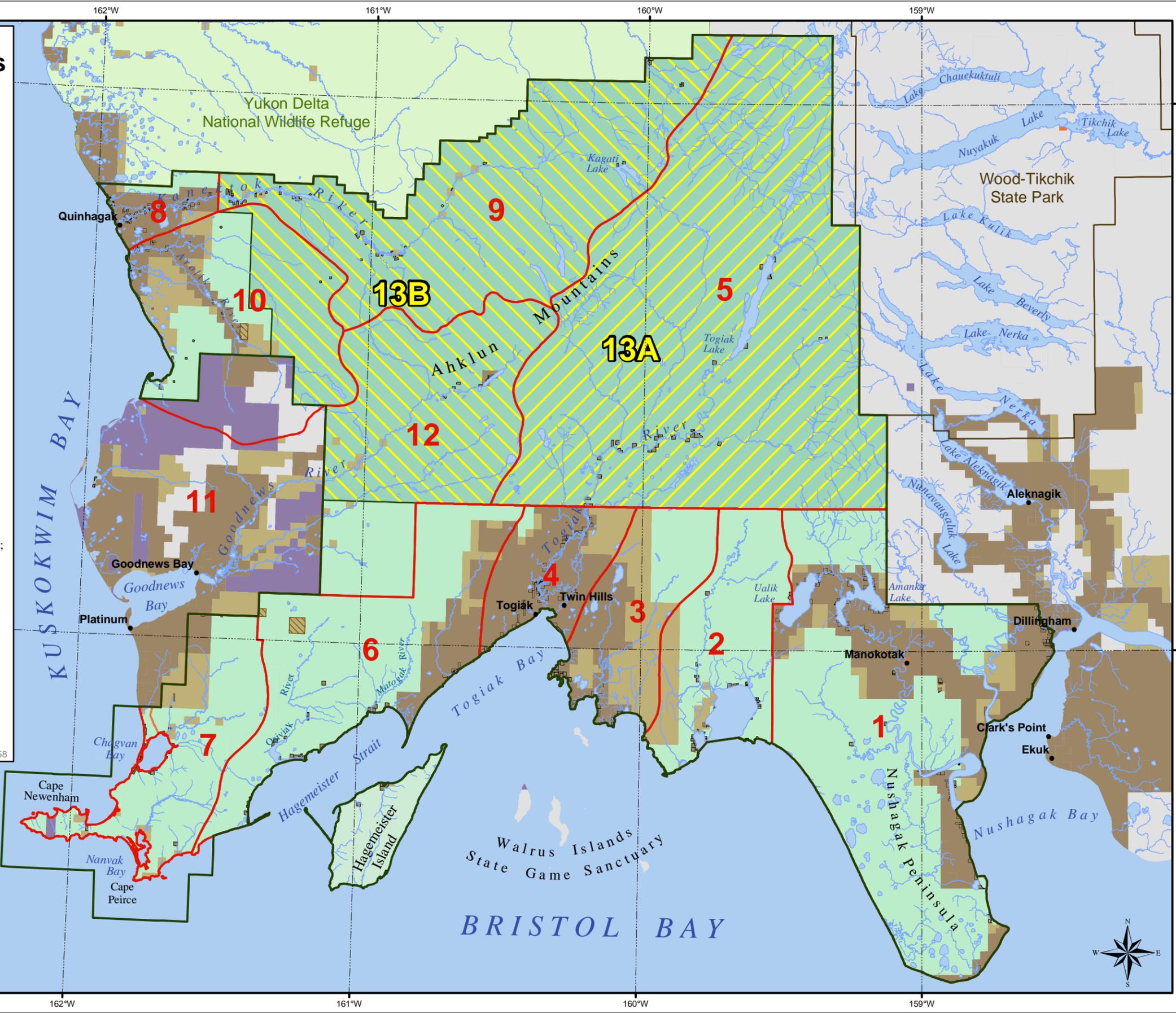
- Public Use Management Plan Unit
- Public Use Management Plan Unit Headwater lakes only.

Note: Unit 13 overlays the Togiak Wilderness. It includes only the unit lakes. Unit 13A overlays Unit 5, including headwater lakes in the Bristol Bay drainage; Unit 13B overlays the wilderness portions of Units 9, 10, and 12, including headwater lakes in the Kuskokwim Bay drainage.



Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak NWR and Hagemeyer Island (Alaska Maritime NWR). Land status within Togiak refuge boundary represents USFWS interpretation of BLM records, and is current to 7/2008. Land status outside Togiak refuge boundary is section level data provided by the BLM. Small parcels may not be visible at this scale.



163°W 162°W 161°W 160°W 159°W

60°N 59°N

60°N 59°N

Justification

A purpose of the Togiak National Wildlife Refuge is to conserve fish and wildlife populations and habitats in their natural diversity. A strategy of the Refuge Fishery Management Plan is to manage fish populations under the "wild" concept. Under this Figure 2-1 PUMP planning units

Opportunities for commercial sport fishing activities on lands administered by the refuge in this unit are extremely limited based on the character of the topography and the location of private land holdings. The predominate use of the unit is for subsistence activities by residents of Manokotak, Dillingham, and Aleknagik.

No opportunities are permanently foregone by not providing guided sport fishing within the unit at this time.

22 Alternative A: No Action

The Service would continue to implement current management as outlined in the 2008 Togiak Refuge Comprehensive Conservation Plan and the 1991 Togiak Refuge Public Use Management Plan and its amendments.

221 *Issue 1. Public Use within the Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake****Management Direction***

Management of the Cape Peirce Wildlife Viewing Area emphasizes wildlife viewing opportunities that complement the research and study of fish, wildlife, plants and their habitats.

Visitation

The southwestern portion of the Togiak Refuge near Cape Peirce has been identified as a Wildlife Viewing Area, from May 1 through November 30 (Figure 2-2). Recommendations in the 1991 Public Use Management Plan would be fully implemented by promulgating regulations to require visitors to Cape Peirce to have permits. Permits would be limited to six people at one time.

A seasonal field camp at Cape Peirce is staffed by Refuge personnel periodically during the May through November restricted-use period. Refuge personnel would continue to monitor visitor use and provide information to the Refuge office on weather, landing conditions, and haulout status.

The regulation of access is intended to provide opportunities for visitors while minimizing disturbance to wildlife. Access to Cape Peirce is possible via floatplane, wheel plane, and boat. During times when walrus are hauled out at Maggy Beach and/or seals are hauled out in southern Nanvak Bay, aircraft access directly into the Wildlife Viewing Area is not allowed, and boat access to the Wildlife Viewing Area is restricted. However, alternate access points adjacent to the Wildlife Viewing Area (Sangor Lake and northern Nanvak Bay) are available throughout the season. Access criteria are outlined on permits for visitors, guides, air taxi operators, and marine transporters. Refuge personnel at Cape Peirce provide information on marine mammal activity and determine if the access criteria have been met.

Permit Allocation

Regulations will be promulgated to require visitors to have a permit. No allocations of guided or unguided wildlife viewing would be set at this time. Visitation would continue to be limited by first-come, first-served permit to one flight per day and six people at one time. Permits would

become available only during a specified permit application period and possibly issued by lottery if demand for visitation increases.

Facilities

Camping areas and two access trails to marine mammal haulouts, wildlife-viewing platforms, and marine bird colonies are designated. Trails are confined to a single path and are maintained where necessary to prevent erosion or to maintain visitor safety. Minimal facilities are provided for seasonal staff, including cabins and outhouses. The two small cabins on the site (192 sq. ft. and 440 sq. ft.) are constructed on pilings. These are not available for public use. There are currently no other public facilities provided. Future public facilities at Sangor Lake may include additional designated trails, camping areas, and outhouse facilities as needed to minimize disturbance and impact to wildlife populations and habitat. As use increases, a naturalist or interpreter may be present to monitor use and provide information to visitors.

2.22 *Issue 2 Unguided Recreational Opportunities in the Kanektok and Goodnews River Watersheds*

Under Alternative A, unguided use would be allowed to continue with no restrictions.

2.23 *Issue 3 Human Waste Management*

Disposal of solid human waste would continue to be allowed on refuge lands more than 100 feet measured horizontally from mean high water level as allowed by State law. Proper disposal techniques would continue to be encouraged. Existing outhouses at Kagati and Goodnews lakes would continue to be maintained. The refuge will monitor water quality periodically to assess the need for further action.

2.24 *Issue 4 Commercial Recreational Fishing in the Goodnews, Osviak, Matogak, and Togiak River Watersheds*

Goodnews River

Under Alternative A, existing commercial recreational fishing permits for the Goodnews River would all be awarded through a non-competitive process. Allowable uses, facilities, and client days for each permit would remain unchanged. One motorized use permit for the North Fork would continue to authorize one temporary camp and the use of nine motor boats to provide recreational opportunities for as many as 27 people (18 clients) at one time. One motorized permit for the Middle Fork would continue to authorize one temporary camp and two motor boats to provide recreational opportunities for as many as six people (four clients) at one time.

Permits for guided float use would allow a total of one float trip per week on the North Fork Goodnews River for up to 12 people per trip distributed among four boats.

Osviak and Matogak Rivers

No guiding permits would be offered on either of these rivers, although the public lands would remain open for unguided public use. Transporters would be allowed to provide transport services for unguided public use.

Togiak River

Three motorized use permits would continue to be offered in three separate motorized use zones (Figure 2-3). One motorized use permit is allowed in each zone. Each of these permits would allow access for not more than eight people at one time and for the use and storage of no more than two motorboats. One additional motorized permit would continue to allow use of one motorboat and four people, with no boat storage. All guided motorized recreation is day-use only. Existing guide use permits for two float trips per week with two boats and eight people per trip within the Togiak Wilderness Area would continue. This results in a maximum of seven

motorboats and 28 people per day, and two float trips per week, consisting of two boats and eight people per trip.

23 Alternative B

Actions discussed in this alternative are in addition to actions described in Actions Common to All Action Alternatives (section 2.4).

2.3.1 *Issue 1. Public Use within the Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake*

Management Direction

The management direction for the Cape Peirce Wildlife Viewing Area would emphasize wildlife viewing that complements the research and study of fish, wildlife, plants, and their habitats.

Visitation

As in Alternative A, recommendations in the 1991 Public Use Management Plan would be fully implemented by promulgating regulations to require visitors to Cape Pierce to have permits. All other visitation actions are the same as Alternative A.

Permit Allocation

Regulations will be promulgated to require visitors to have a permit. Visitors could choose to visit Cape Peirce with a guide (guide obtains permit) or unguided, with a transporter or using private transportation (visitor obtains permit). Permits for guides and for private parties would be available on alternate days. Permit requirements require the promulgation of regulations.

To help ensure maximum use of permits during the relatively short viewing season (generally June and July) a common pool system would be used. In this common pool system, permits not issued two weeks prior to the permit date would be available on a first-come, first-served basis to any interested party (guides or unguided) regardless of the overall allocation.

Permits for wildlife viewing guides would include additional requirements to provide quality wildlife viewing experiences; educate clients about fish, wildlife, plants, and other cultural resources in the Cape Peirce area; and promote the purposes of the Togiak Refuge and the mission of the Service. If demand increases for overnight or extended camping, a limited number of multi-day permits would become available to insure continued opportunities for day use during the peak viewing season.

Facilities

Facilities would remain the same as in Alternative A.

2.3.2 *Issue 2 Unguided Recreational Opportunities in the Kanektok and Goodnews River Watersheds*

This alternative would require permits for the use of Refuge lands along the Kanektok River and all forks of the Goodnews River. All permits would be made available each year between late September and April by means of a reservation system. Unreserved permits remaining after the close of the reservation period would be available throughout the season on a first-come, first-served basis. Information related to Togiak Refuge resources, weather, water levels, camping limits, private land use permits, and recreational fishing regulations would also be available through this permit system.

In remote wilderness areas, it is not feasible or practical for visitors to adhere to a strict schedule. In many cases, last-minute changes must be made because of weather and plane availability. Alternative B establishes a standard of one float start every other day but would allow this to be exceeded as much as 20 percent of the time. For example, during a two week period, there could be three days where multiple groups arrive at Kagati Lake. If this standard is consistently exceeded, the Togiak Refuge would take additional actions as necessary based on Refuge monitoring. These actions may include a revision of the standard to allow more flexibility or increased enforcement to ensure proper compliance.

Kanektok River

To more evenly distribute float starts, no more than one unguided permit would be issued every other day through a reserved permit system for the use of Refuge lands within the Kanektok River watershed. Permits would allow a maximum party size of 12 people distributed among four boats. This alternative would evenly distribute all float starts by scheduling unguided float trips to alternate with guided trips.

Goodnews River

Unguided use of Refuge lands within the Goodnews River watershed would be capped at existing levels of visitation. Unguided visitation grew rapidly in the 1990s, but use has been comparatively stable during the 2000 through 2009 period. For the purposes of this plan, “existing levels” would be equivalent to the average annual visitation during the period 2000-2006, or about 44 unguided trips per year.

2.3.3 *Issue 3. Human Waste Management*

Disposal of solid human waste would continue to be allowed on refuge lands more than 100 feet measured horizontally from mean high water level as allowed by State law. Proper disposal techniques would continue to be encouraged. Existing outhouses at Kagati and Goodnews lakes would continue to be maintained. The refuge will monitor water quality periodically to assess the need for further action. A Public Use Monitoring Plan would be developed which would select indicators related to waste disposal aesthetics along the Kanektok River. In addition to burying waste 100 feet, measured horizontally from mean high water level, if monitoring suggests that standards for aesthetics or water quality are at risk of being exceeded, regulations would be promulgated to require all float groups to carry out solid human waste on the Kanektok River.

2.3.4 *Issue 4. Commercial Recreational Fishing in the Goodnews, Osviak, Matogak, and Togiak River Watersheds*

Goodnews River

Commercial recreational fishing on the North Fork Goodnews River would be the same as Alternative A (no action) The temporary guide camp on the Middle Fork Goodnews River would be permitted to have no more than three motorboats and 10 people (four guides and six clients) at one time. This is an increase of one boat and four people above Alternative A (no action).

Guided float use would remain one trip per week on the North Fork Goodnews River as in Alternative A (no-action).

Osviak and Matogak Rivers

As in Alternative A (no action), guide permits would not be offered for these drainages.

Togiak River

Same as Alternative A (no action).

Figure 2-2.

Cape Peirce Wildlife Viewing Area



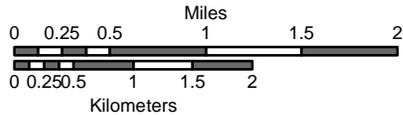
Togiak National Wildlife Refuge

- Migratory Waterfowl
- Seal Haulout
- Walrus Haulout
- SeaBird Rookery
- Wildlife Viewing Area

Togiak Refuge - Minimal Management

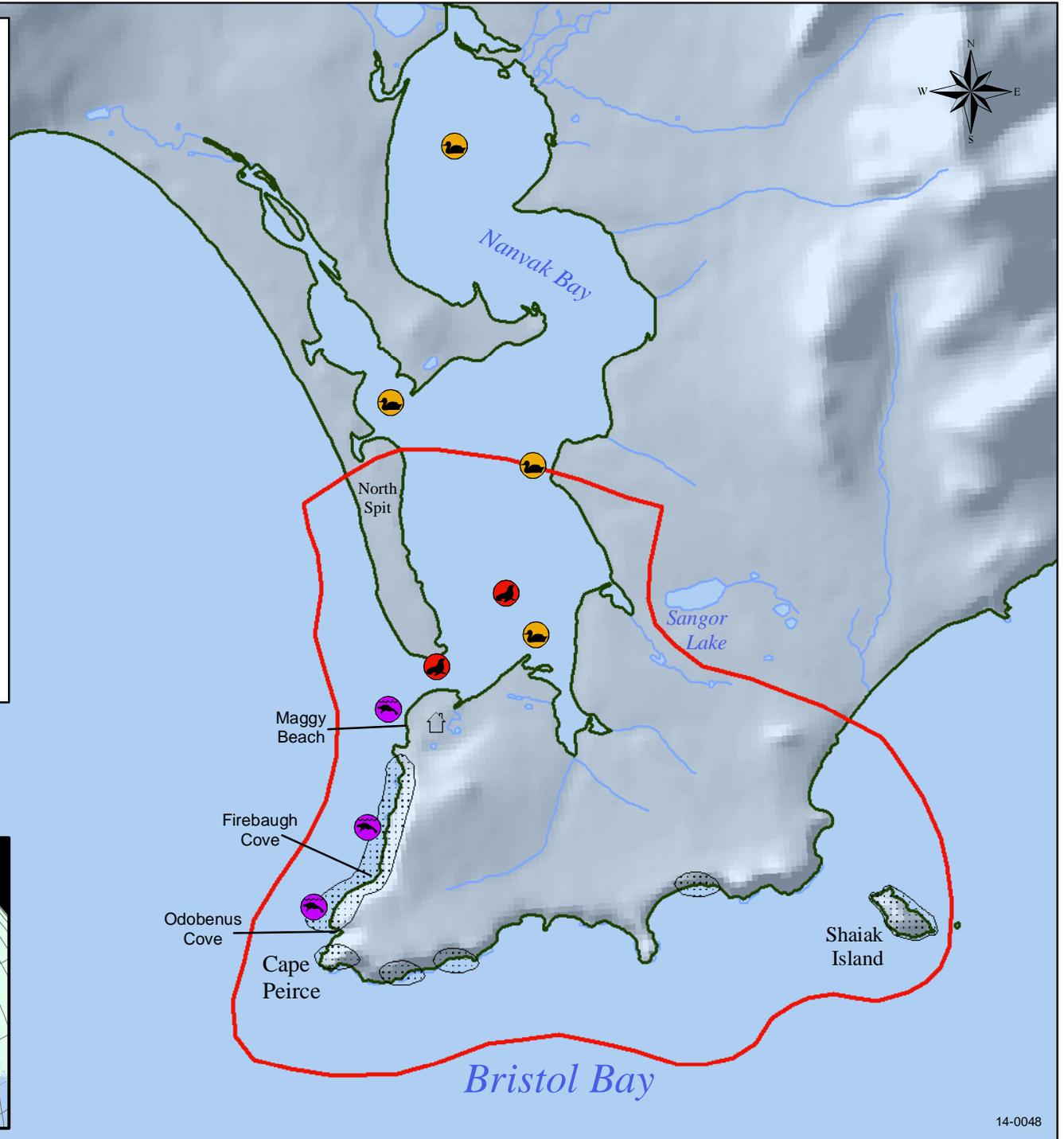
Lands Not Administered by Togiak Refuge

FWS Administrative Cabin



Universal Transverse Mercator Projection - Zone 4.
1927 North American Datum.

Land status represents USFWS interpretation of BLM records. Wildlife data derived from the Togiak PUMP (1991) published by the USFWS.



2.4 Alternative C (Preferred Alternative)

Actions discussed in this and other alternatives are in addition to actions described in Actions Common to All Action Alternatives (section 2.4).

2.4.1 *Issue 1 Public Use within the Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake*

The Cape Peirce and Cape Newenham subunit lies within a “wildlife sensitive zone” designated on the Kodiak Sectional Aeronautical chart published for pilots. This designation emphasizes the importance of the area for wildlife, and pilots are requested to avoid flight below 2,000 feet above ground level from April 1 through October 31. The Refuge continues to support this designation and would request that the Federal Aviation Administration also designate the Chagvan Bay subunit as a wildlife sensitive zone with the same flight request and dates.

Management Direction

Under this alternative, management would facilitate wildlife viewing that complements the protection and preservation of the area’s natural and cultural resource values.

Visitation

Regulations would be promulgated to require all visitors to Cape Peirce to have permits. The maximum number of people visiting the wildlife viewing area at one time would increase from six to 12 with the opportunity for two flights per day to transport them. To minimize the potential for wildlife disturbance as more people and aircraft access the area, a commercial guide or Refuge staff would accompany groups of visitors during peak use periods when more than six people are present at one time. This would ensure the highest visitor standards and ethics are maintained and would minimize any potential negative impacts to the area’s sensitive wildlife and cultural resources. Aircraft landings would be restricted to minimize disturbance to marine mammals. If walrus are hauled out on Maggy Beach, no aircraft access would be allowed into the wildlife viewing area. If seals are hauled out, there would be an average of two flights for public use each week. Additional access would be available by using Sangor Lake or by timing landings in Nanvak Bay during high tide when seals are generally not hauled out. If public use of Cape Peirce is significantly below (more than 10 percent) the visitation level authorized on a seasonal basis, the refuge manager may waive the need for permits to enter the wildlife viewing area. Other permit requirements to minimize wildlife disturbances would be the same as in Alternative A (no action).

Allocation

Allocation of permits would be the same as Alternative B, with visitors having the option of visiting with a commercial guide or on their own. A common pool would be established to distribute unused permits.

Facilities

This alternative includes tent platforms and associated facilities to accommodate up to 12 people. These facilities could take a variety of forms, but would likely consist of four to six tent platforms, each approximately 100 square feet. The tent platforms would have a footprint slightly smaller than a small cabin. Supporting facilities would include outhouses and food storage as well as a water source. Boardwalks would be used wherever possible to minimize compaction from foot traffic.

24.2 Issue 2 Unguided Recreational Opportunities in the Kanektok and Goodnews River Watersheds

Regulations would be promulgated to require permits for the use of Refuge lands along the Kanektok River and all forks of the Goodnews River. Permits for both the Kanektok and Goodnews rivers would be required only during peak use periods that coincide with the chinook and coho salmon seasons (approximately June 25–July 15 and August 10–September 7). Permits would allow a maximum party size of 12 people distributed among four boats. The permit system and its administration would be similar to that in Alternative B. During the “shoulder” seasons (before June 25, July 16–August 9, and after September 7), visitors would not be required to obtain float trip permits. At low use levels the refuge manager may waive the requirement to have permits.

Kanektok River

Unguided float use would be limited to one new group every other day, alternating with guided trips on Refuge lands in the Kanektok River watershed.

Goodnews River

Float use would be limited to one group every other weekday (Tuesday and Thursday) and one on each weekend day on Refuge lands in the Goodnews River watershed.

24.3 Issue 3 Human Waste Management

Same as Alternative B.

24.4 Issue 4 Commercial Recreational Fishing in the Goodnews, Osviak, Matogak, and Togiak River Watersheds

Goodnews River

Guided motorized use on the North Fork would be limited to one trip and three people per day with no temporary camp allowed on Refuge lands. The motorized recreational fishing guide permits for the Middle Fork Goodnews River would be the same as in Alternative A (no action) with one temporary camp and the use of two motorboats per day to provide opportunities for up to four clients at one time.

Guided float use would be slightly more than that in Alternative A (no-action) with one float trip per week and the option of using either the Middle or North Fork Goodnews River. Maximum float group size would be 12 people distributed among four boats, similar to other commercial and private float permits in this alternative.

Osviak and Matogak Rivers

Same as Alternative A.

Togiak River

Same as Alternative A.

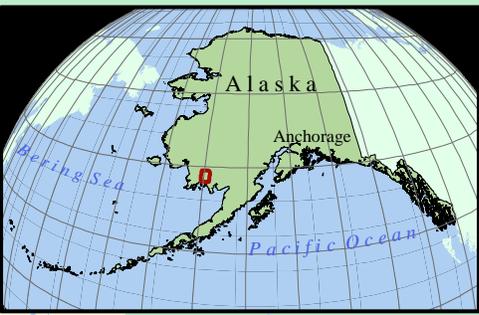
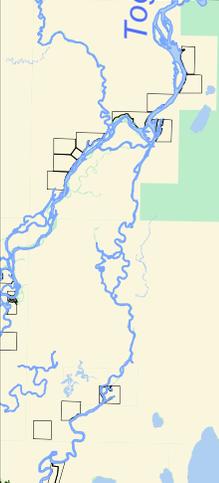
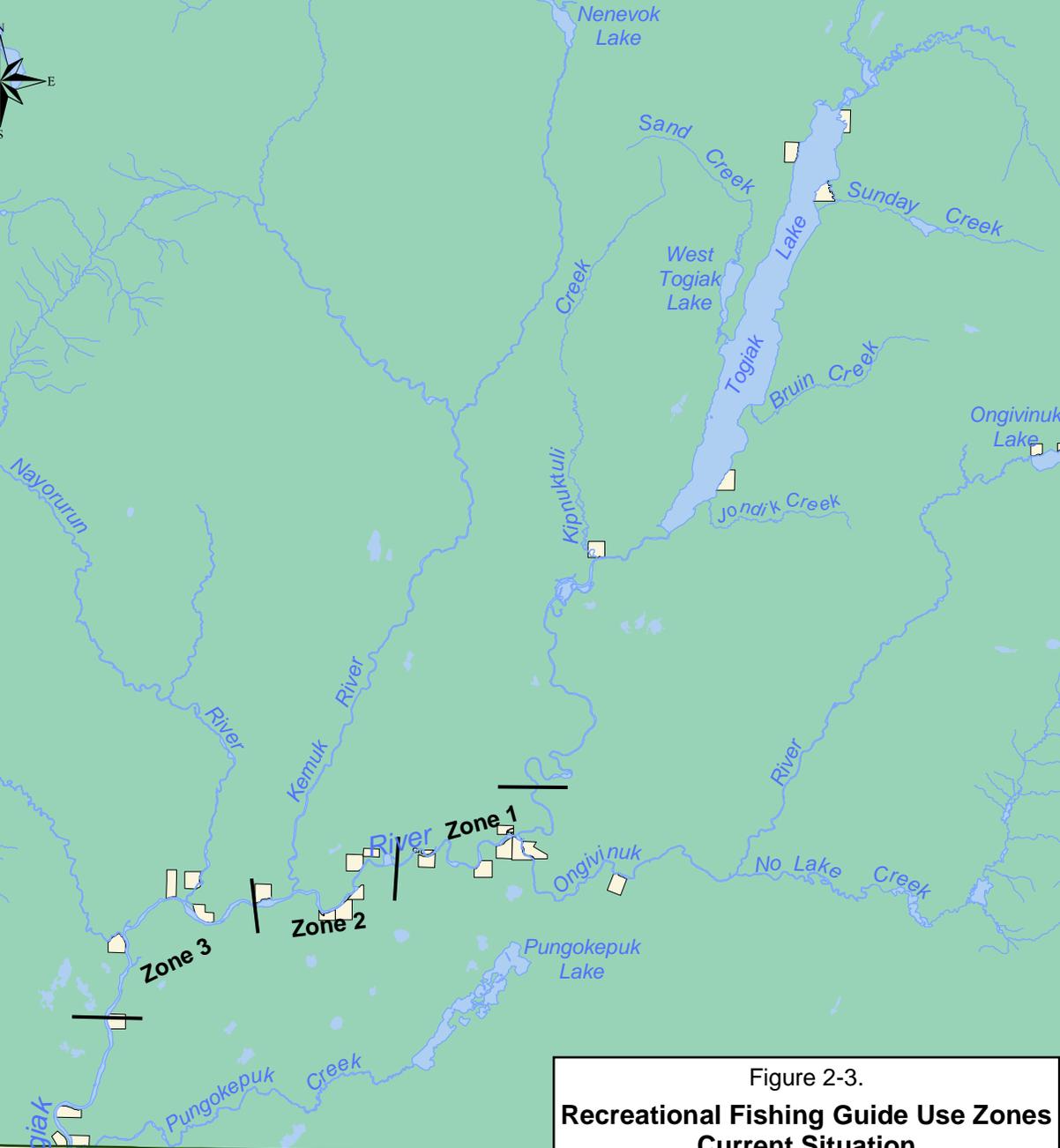
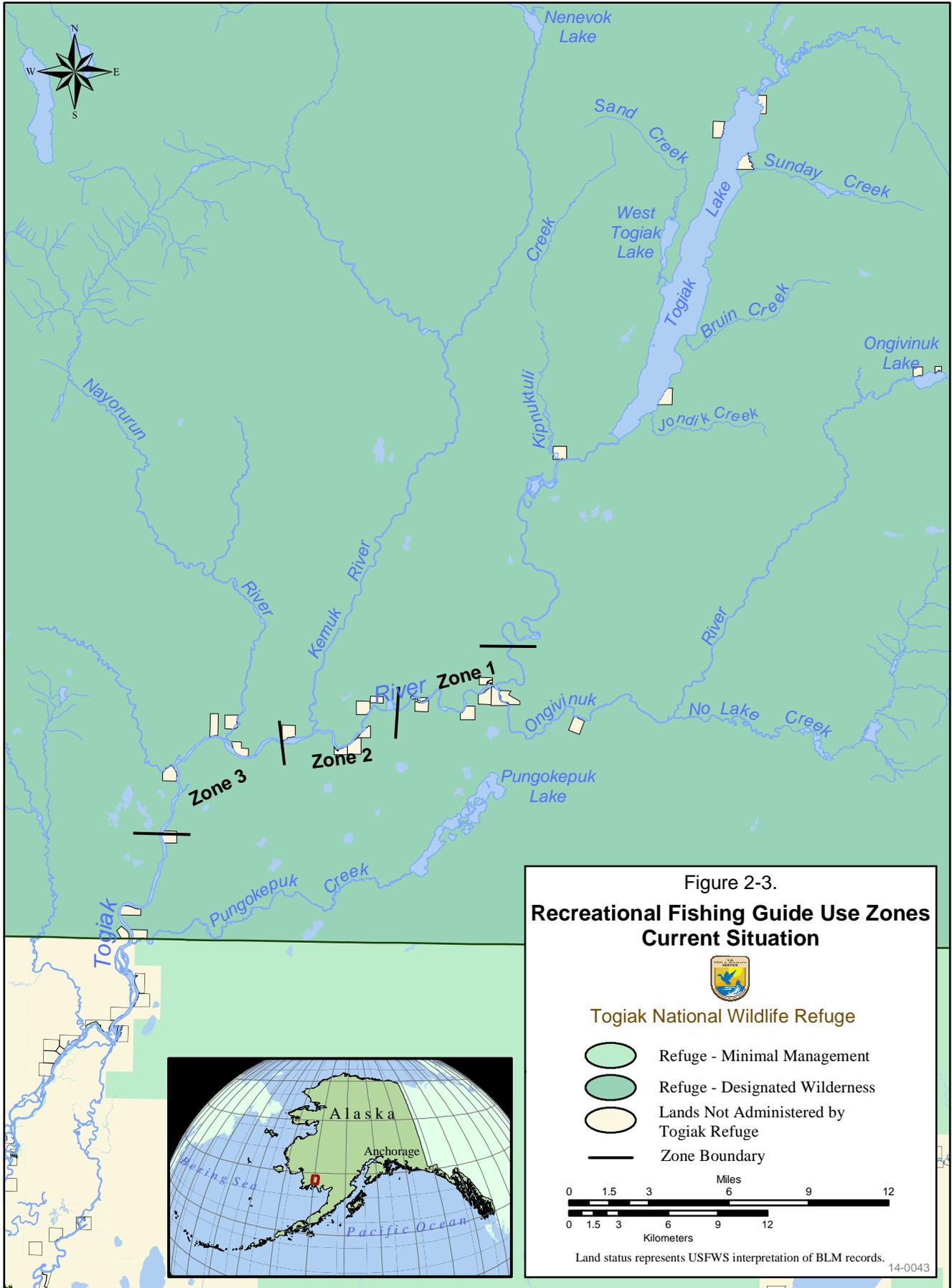
25 Alternative D

Actions discussed in this alternative are in addition to actions described in Actions Common to All Action Alternatives (section 2.4)

25.1 Issue 1. Public Use within the Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake

Management Direction

This alternative would emphasize a structured wildlife viewing experience.



Visitation

All visitors to the Cape Peirce wildlife viewing area would be accompanied by a permitted wildlife viewing guide. Guide permits would be awarded through a prospectus bid similar to other guide permits at the Togiak Refuge. Guides would provide the public with information about fish, wildlife, plants, cultural resources, and natural history as a requirement of their permit.

The maximum number of people visiting the wildlife viewing area at one time would increase from six to 12. Aircraft landings would be restricted to minimize disturbance to marine mammals. If walrus are hauled out on Maggy Beach, no aircraft access would be allowed into the wildlife viewing area. If seals are hauled out, there would be an average of two flights for public use each week. Additional access would be available by using Sangor Lake or by timing landings in Nanvak Bay during high tide when seals are generally not hauled out. Other permit requirements to minimize wildlife disturbances would be the same as in Alternative A (no action).

Allocation

Regulations would be promulgated to require permits to visit Cape Peirce Wildlife Viewing Area. The entire allocation would be devoted to commercially guided use.

Public Use and Facilities

Additional public facilities could be constructed to accommodate as many as 12 people and m would likely consist of a central cabin of approximately 400 sq. ft. for use as a shared cooking and gathering site, and six tent platforms., bear-proof food storage, an outhouse, and maintained trails.

2.5.2 *Issue 2 Unguided Recreational Opportunities in the Kanektok and Goodnews River Watersheds*

Under this alternative, standards related to recreational opportunities and wilderness solitude in the Public Use Monitoring Plan would be designed to provide additional guided and unguided recreational opportunity. Standards would be developed to reflect increased unguided visitation to between 70 and 76 starts per year by the year 2020 (see section 4.4.2).

To assist people in planning their trips to the Togiak Refuge, visitors would be able to view and schedule float starts through a voluntary registration permit system. Information would be made available through the Togiak Refuge via internet web site, telephone, or postal service. In addition, permitted air taxi operators would be provided with regular updates on voluntarily scheduled float trips. Additional information related to Togiak Refuge resources, weather, water levels, camping limits, private land use permits, and recreational fishing regulations would also be available through this system. Permits would not be required.

2.5.3 *Issue 3 Human Waste Management*

A Public Use Monitoring Plan would be developed, which would select indicators related to solid human waste disposal impacts at wilderness campsites. The Refuge would work with partners to facilitate a voluntary pack out program. Through outreach and education efforts, the Refuge would strongly encourage groups to participate in the pack-out program. If monitoring suggests standards are at risk of being exceeded, the Refuge would work toward a mandatory solid human waste pack-out program

2.5.4 Issue 4. Commercial Recreational Fishing in the Goodnews, Osviak, Matogak, and Togiak River Watersheds

This alternative would increase opportunities for guided recreation in the Goodnews, Osviak, Matogak, and Togiak river drainages

Goodnews River

Permits for the North Fork Goodnews River would be offered for a temporary motorized camp within the Togiak Wilderness Area, and would allow nine boats and 27 people per day. The Refuge would also offer a permit for one motorboat trip per day with three people for day use only (no camping). One motorized commercial recreational fishing guide permit for the Middle Fork Goodnews River would be managed as described in Alternative B and would allow slightly more use than currently exists.

Guided float use would be one float trip per week on the Middle Fork and one float trip every other day on the North Fork. Maximum float group size would be 12 people distributed among a maximum of four boats

Osviak and Matogak Rivers

Permits would be offered for the Osviak and Matogak rivers west of the village of Togiak (Figure 2-1). These permits would allow a maximum of one motorized trip per week on either river with a maximum of two boats and six people per trip.

Togiak River

Additional commercial recreational fishing opportunities would be provided on the Togiak River with an increase of seven motorboats and 16 anglers. This alternative would create a fourth motorized guide-use zone near the Kemuk River (Zone 2) and would allow as many as three boats and three people per boat in each of the four motorized zone permits. The number of motor boats allowed to visit each day from below the designated wilderness boundary would increase from one to two and would allow three people per boat. All guided motorized recreation would remain day-use only. There would be a total of 14 motorboats and 42 people per day.

In addition to changes in the number of motorized boats and anglers, Alternative D would allow float trip guides the option of floating the Togiak River main channel or the Ongivinuck River to provide options during periods of low water in the Ongivinuck River and ensure a range of wilderness opportunities. As in Alternative A, a combined total of two float trips, each with two boats and eight people, would be allowed each week.

26 Alternative E

Actions discussed in this and other alternatives should be considered in addition to actions described in Actions Common to All Action Alternatives (section 2.4)

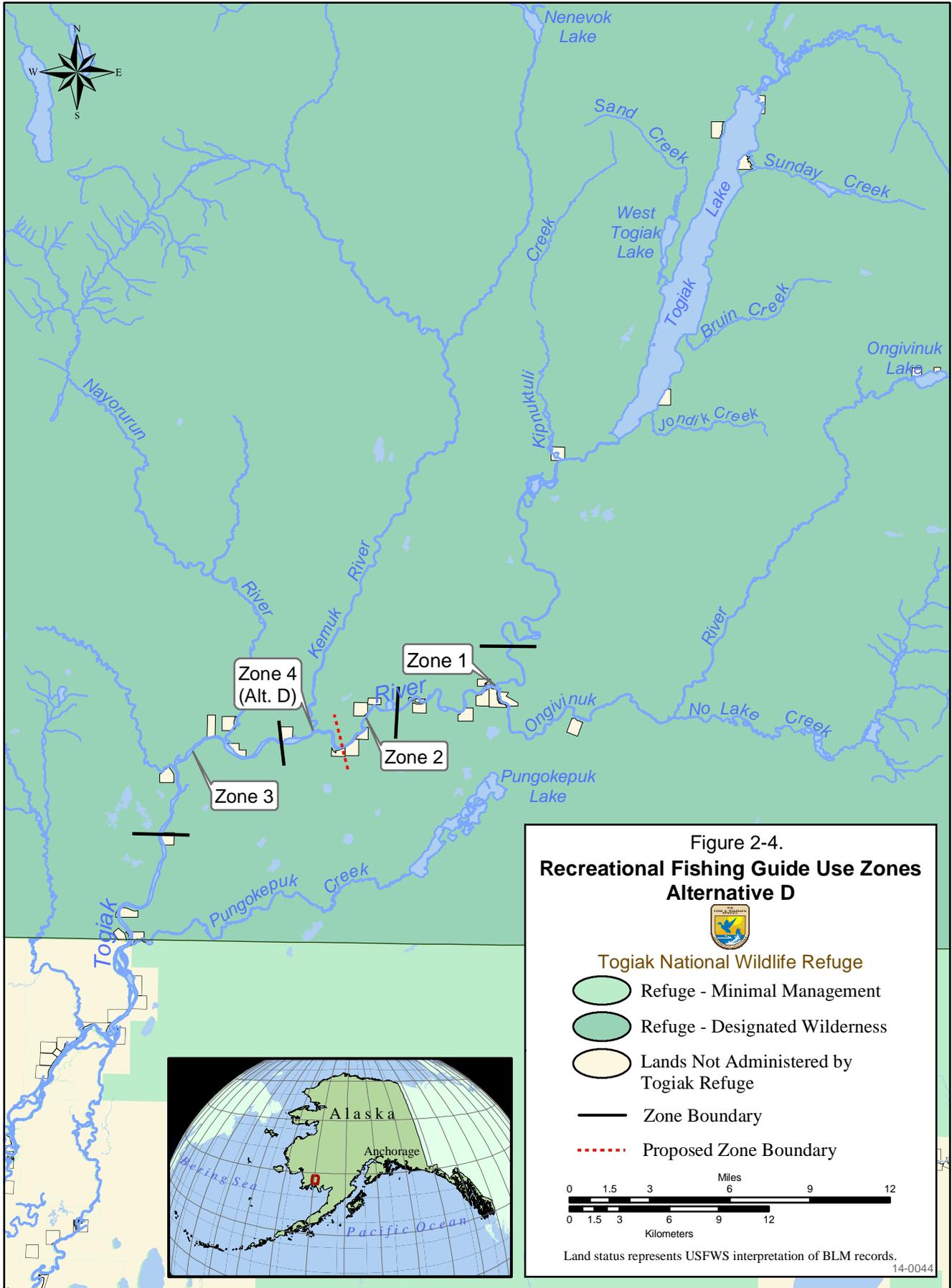
26.1 Issue 1. Public Use within the Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake

Management Direction

Management would emphasize wildlife viewing and educational and outreach programs that focus on cultural and natural significance of the area.

Visitation

Same as Alternative A.



Allocation

Regulations will be promulgated to require permits to visit Cape Peirce. Thirty percent of the permits will be allocated to guides and 70 percent will be allocated to the general public. A limited number of permits for one to four nights' camping would be available to ensure continued opportunities for both day and overnight use. Unreserved permits would become available through a common pool two weeks prior to the permit date.

Public Use and Facilities

Additional public facilities could be constructed to accommodate as many as 12 people and would likely consist of a central cabin of approximately 400 sq. ft. for use as a shared cooking and gathering site, and six tent platforms. Supporting facilities could include bear-proof food storage, an outhouse, and maintained trails and a public use cabin with space to accommodate interpretive, cultural, and natural history presentations and programs. From May 1 through November 30, public use of the cabin would be by permit only.

26.2 *Issue 2 Unguided Recreational Opportunities in the Kanektok and Goodnews River Watersheds*

Standards related to recreational opportunities and wilderness solitude in the Public Use Monitoring Plan would be designed to reduce and more evenly distribute visitation within the Togiak Wilderness Area.

Regulations would be promulgated to require permits for unguided float groups on the Kanektok and Goodnews rivers and the number of those permits would be limited to one new group every three days. Permits would allow nine people per trip distributed among three boats and would be issued to avoid overlapping with guided groups that are permitted to start every other day on the Kanektok River and once per week on the North Fork Goodnews River. Permits would be administered as in Alternative B.

Unguided float use for the Middle Fork Goodnews River would remain unrestricted.

26.3 *Issue 3 Waste Management*

The Public Use Monitoring Plan would select indicators related to human waste disposal impacts at wilderness campsites. Standards would be more stringent than in all other alternatives and would allow no degradation of existing conditions or would require conditions improve.

To ensure these standards are met and maintained, the Refuge would promulgate regulations to implement a mandatory solid human waste pack-out program for all Kanektok River users. The Refuge would work with local communities, Native village councils, Native village corporations, and State of Alaska departments of Environmental Conservation (DEC), Natural Resources (DNR), and Fish and Game (ADF&G) to ensure adequate facilities are provided and an efficient system for informing visitors is implemented.

Existing commercial recreational fishing permits, which require approved waste disposal methods, would remain unchanged.

26.4 *Issue 4. Commercial Recreational Fishing in the Goodnews, Osviak, Matogak, and Togiak River Watersheds****Goodnews River***

Opportunities for motorized use would be the same as Alternative A.

Permits for guided float use would allow a total of one float trip per week on the North Fork Goodnews River for a maximum of 12 people per trip distributed among four boats.

Osviak and Matogak Rivers

Guide permits would not be offered for these drainages.

Togiak River

Same as Alternative A

27 Summary Comparison of Action Alternatives

Each alternative in this plan proposes actions to manage the level and frequency of recreational use on Refuge administered lands through either indirect or direct action. Some assumptions were used in projecting visitor use for each alternative. For example, not all commercial recreational fishing guides (both motorized and float) utilized 100 percent of their permitted use, especially during non-salmon seasons. Therefore, guided use is assumed to be 63 percent of the maximum permitted use under each alternative.

Only Alternative D proposes to change guided recreational opportunities along the Togiak River. Table 2-2 provides a comparison of Plan alternatives as they relate to guided recreational fishing opportunities along the Togiak River.

Table 2-3 and Table 2-4 summarize the five Plan alternatives.

Table 2-2 Togiak River commercial recreational fishing permit alternatives

	Exclusive Guide Use Zones	Motorboats Allowed	Rafts Allowed	People Allowed at One Time**
Alternatives A, B, C, and E	3, plus one rover*	7	4	44
Alternative D	4, plus two rovers*	14	4	58

*A rover is permitted to move from one exclusive guide-use zone to another, meaning that two guides (the guide with the exclusive permit and the rover[s]) could be in the same zone simultaneously.

**Combined motorized and float use.

Table 2-3 Alternatives for the Togiak Refuge Public Use Management Plan Revision

	Alternative A (current management)	Alternative B	Alternative C (Preferred Alternative)	Alternative D	Alternative E
Issue 1. Public Use at Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake	Management Direction —Emphasize wildlife viewing that complements the research and study of fish, wildlife, plants, and their habitats	Management Direction —Same as Alternative A	Management Direction —Facilitate wildlife viewing that complements the protection and preservation of the area’s natural and cultural resource values	Management Direction —Emphasize a structured wildlife-viewing experience.	Management Direction —Emphasize wildlife viewing and educational and outreach programs that focus on cultural and natural significance of the area
	Visitation —Maximum one flight per day and six people at one time. Permits required May 1 through Nov. 30.	Visitation —Same as Alternative A	Visitation —Additional opportunities for as many as two flights per day and 12 people at one time. Guide or refuge staff may accompany. At low use levels refuge manager may waive permits.	Visitation —All visitors accompanied by permitted wildlife viewing guide May 1 through Nov. 30. Two flights per day 12 people at one time.	Visitation —Same as Alternative C
	Allocation —Permits for all visitors issued on first-come, first-served basis	Allocation —50 percent commercially guided/ and 50 percent general public; unused permits available through a common pool	Allocation —Same as Alternative B	Allocation —100 percent commercially guided use	Allocation —30 percent commercially guided and 70 percent accompanied by Refuge staff; unused permits available through a common pool. Limited overnight camping by permit
	Facilities —No facilities constructed. An outhouse could be constructed to protect natural resources and public health. Camping areas and trails are designated.	Facilities —Same as Alternative A	Facilities —Minimal facilities for as many as 12 people to ensure public health, and safety (i.e., tent platforms, food storage, outhouse)	Facilities —Moderate facilities to accommodate as many as 12 people, (i.e., one cabin, tent platform, outhouse and maintained trails)	Facilities —Same as Alternative D, plus accommodations for interpretive cultural and natural history programs (i.e., large cabin with meeting area and outhouse)

	Alternative A (current management)	Alternative B	Alternative C (Preferred Alternative)	Alternative D	Alternative E
<p>Issue 2. Unguided Recreational Opportunities: Kanektok and Goodnews River Watersheds</p>	No limits	<p>Kanektok—One trip every other day; maximum four boats and 12 people per trip</p> <p>Goodnews—Limit to existing level of use</p>	<p>Kanektok—One trip every other day, during peak use seasons (June 25–July 15; August 10–September 7); maximum four boats and 12 people per trip.</p> <p>Goodnews—Same as the Kanektok. In addition, two trips on weekends during peak use seasons</p> <p>Both rivers--Permits required. At low use levels refuge manager may waive permits.</p>	No limits. Voluntary trip registration available all season	<p>Kanektok—One trip every three days; maximum three boats and nine people per trip</p> <p>North Fork Goodnews—One trip every three days; maximum three boats and nine people per trip</p> <p>Middle Fork Goodnews—no restrictions</p> <p>Both rivers--Permits required. At low use levels refuge manager may waive permits</p>
<p>Issue 3. Human Waste Management</p>	Bury waste 100 feet, measured horizontally from mean high water level; outhouses at Kagati and Goodnews lakes. Water quality will be monitored.	In addition to actions in Alternative A, if monitoring suggests standards for aesthetics or water quality are at risk of being exceeded, require all float groups to carry out solid human waste on the Kanektok River. Water quality will be monitored.	Same as Alternative B	In addition to actions in Alternative A, work with partners to facilitate the voluntary packing out of human waste. Water quality will be monitored.	Implement human-waste pack-out program for all users on Kanektok River. Water quality will be monitored.

Table 2-4 Issue 4. Commercial Recreational Fishing Guide Alternatives for the Togiak Refuge Public Use Management Plan Revision Draft

	Alternative A (current management)	Alternative B	Alternative C (Preferred Alternative)	Alternative D	Alternative E
Goodnews River	Motorized --Up to 9 motorboats and 27 people at one time. Average use 1990–2001; 17 trips per year Float —One trip per week; maximum 4 boats and 12 people per trip	Same as Alternative A	Motorized —One boat and three people per day	Motorized —Temporary camp; maximum nine motorboats and 27 people per day; plus day use only for one boat and 3 people	Same as Alternative A
North Fork			Float —One trip per week (with option of using Middle Fork); maximum four boats and 12 people per trip	Float —One trip every other day; maximum four boats and 12 clients per trip	
Middle Fork	Motorized —One temporary camp; two boats and six people per day	Motorized —One temporary camp, three boats and 10 people per day	Motorized —Same as Alternative A	Motorized —One temporary camp with three motorboats and 10 people per day	Same as Alternative A
	Float—None	Float—None	Float —One trip per week (with option of using North Fork); maximum four boats and 12 clients per trip	Float —One trip every week; maximum four boats and 12 people per trip	
Osviak and Matogak Rivers	No permits	Same as Alternative A	Same as Alternative A	Motorized —One trip per week (either river); maximum two boats and six people per trip	Same as Alternative A
Togiak River	Motorized —Maximum seven motorboats and 28 people per day Float —Two trips per week; two boats and eight people per trip	Same as Alternative A	Same as Alternative A	Motorized —Maximum 14 motorboats and 42 people per day Float —Two trips per week maximum two boats and eight people per trip	Same as Alternative A

NOTES: Management activities undertaken by the Service, or by volunteers, cooperators, or contractors working for the Service, with limited exception, are exempt from compatibility review [Part 603, Compatibility, of the Service Manual].

The term “temporary” refers to any structure or other human-made improvement that can be readily and completely dismantled and removed from the site when the period of authorized use terminates.

Management of activities occurring on navigable waters will be coordinated with the appropriate state agency.

3. Affected Environment

This chapter is reproduced from the Togiak National Wildlife Refuge Comprehensive Conservation Plan (FWS 2009). The draft of this Public Use Management Plan was published in a combined document with the Comprehensive Plan and this chapter served as the Affected Environment for both plans.

3.1 Geographic and Ecosystem Setting

3.1.1 The Bristol Bay and Kodiak Ecosystem

The Togiak Refuge lies within the Bristol Bay and Kodiak Ecosystems. This ecosystem encompasses approximately 60,615 square miles of southwestern Alaska from the Kodiak Archipelago to the Togiak Refuge and includes the southernmost part of the Kuskokwim Bay area south of Bethel and Yukon Delta National Wildlife Refuge.

This ecosystem is one of Alaska's most productive regions for fish and wildlife. The ecosystem's large, diverse, and productive fishery resources are its driving force. Salmon are the principle mode by which nutrients from the ocean are transported to this system. As salmon return to spawn and die, their bodies provide the critical nutrients to support the primary producers in the food chain such as micro invertebrates, insects, and vegetation, which in turn provide food and shelter for the next generation of young salmon. At the same time, salmon supply food for animals much higher in the food chain such as bears, foxes, birds, and people.

These salmon are the driving force behind not only the ecosystem, but also the area's culture and economy. Local people have relied on, and continue to rely on, this ecosystem to provide not only food and income, but also a way of life. The region's commercial and recreational fisheries provides millions of dollars in income and thousands of jobs for people from Alaska, other states, and other countries throughout the Pacific.

The management of the Refuge plays an important role in the continuing function of the Bristol Bay and Kodiak Ecosystem by providing a healthy environment for fish, wildlife, and people.

3.2 Land Status

This plan applies to the Togiak Refuge and Hagemeister Island of the Alaska Maritime Refuge. In this document, the two units are referred to as Togiak Refuge or the Refuge. Management direction discussed in this plan applies only to lands under the jurisdiction of the Service within the boundaries of Togiak Refuge and Hagemeister Island.

The land status on Togiak Refuge continues to change because refuge lands selected by the State of Alaska, Native corporations, and individuals are in the process of being conveyed, rejected, or relinquished. In addition, some private lands within the boundary have been acquired from willing sellers, primarily within the Togiak Wilderness area.

Figure 3-1 shows, in general, the status of lands within the Togiak refuge and Hagemeister Island. Of the 4,899,000 acres of land within the Togiak Refuge boundary, approximately 4,124,000 acres are under Service jurisdiction. Approximately 2,000 acres are under the jurisdiction of other Federal agencies, primarily a military withdrawal at Cape Newenham under the jurisdiction of the U.S. Air Force.

The State of Alaska has approximately 3,200 acres of selected lands within the boundary that have not yet been adjudicated. In addition, the Alaska Department of Natural Resources developed a Special Use Land Designation for “...*State of Alaska shorelands and waters within the Togiak National Wildlife Refuge and lower Goodnews River.*” (Appendix C) See page C-11 for the State’s current management guidelines.

Currently, private entities, including Native corporations and individual Native Alaskans, have selected approximately 228,000 acres that have not yet been adjudicated and approximately 546,000 acres that have been conveyed. Included in those acres are 330 Native allotment parcels. The Alaska Native Allotment Act of 1906, as amended, allowed individual Natives to select as many as four parcels of land totaling 160 acres. At this time, 328 of those claims have been conveyed. There are five remaining parcels to be adjudicated. A 1998 amendment to ANCSA (Section 432 of Public Law 105-276 [43 U.S.C 1629g]) allowed for certain Alaska Native Vietnam veterans to have a renewed opportunity to apply for Native allotments. Eight allotments totaling 879 acres have been selected within the Togiak Refuge. One Alaska Native Vietnam veteran allotment of 82 acres has been conveyed on the refuge.

Hagemeister Island includes 73,884 acres within the Alaska Maritime refuge boundary. Of that, the U.S. Fish and Wildlife Service manages 73,080 acres. Native corporations have selected approximately eight acres that have yet to be adjudicated. There are five conveyed Native allotments on the island totaling 796 acres.

3.3 Physical Environment

3.3.1 Area of Influence

The Refuge’s area of influence includes the Bering Sea, coastal lands and inland waters, and other lands adjacent to the Refuge, including lands within the Yukon Delta Refuge, the Wood-Tikchik State Park, and portions of the middle Kuskokwim River basin. The geology, water, and soils of the Refuge have a variety of physical features, including glacial lakes and moraines. Interior lands and waters are linked to the bays by several rivers. The refuge boundary encompasses all, or portions of, 35 major rivers, 25 major lakes, and hundreds of smaller lakes, ponds, and streams. These features, combined with the influence of the Bering Sea, affect the climate and weather of the refuge and provide habitat and migration pathways for fish, wildlife, and plants.

3.3.2 Climate

The Refuge is located in a transitional climatic zone, and weather conditions are widely variable throughout the Refuge at any given time. Both the maritime climate of the Bering Sea and the continental climate of interior Alaska affect the Refuge, with the majority of the year being overcast or cloudy. Temperatures in the area range from an average minimum of four degrees Fahrenheit to an average maximum of 60 degrees Fahrenheit. Fall is the wettest time of year, while the least precipitation occurs in spring. Average annual precipitation is 25 inches. Annual snowfall ranges from 60 inches along the coast to more than 150 inches in the mountains.

Major climatic changes have occurred in recent decades with visible and measurable consequences in Alaska. The effects of these changes on Alaskan flora and fauna challenge Service mandates to conserve the fish, wildlife, plant resources, and refuges in its trust. Forest, tundra, marine, and freshwater ecosystems are all vulnerable to a changing climate, which can influence Alaska’s biodiversity in a myriad of complex and unpredictable ways, and will likely transform Service trust resources and lands in ways we

Figure 3-1.
Generalized Land Status



Togiak National Wildlife Refuge

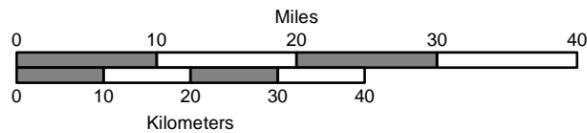
- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Yukon Delta National Wildlife Refuge

Private

- Native Private Fee
- Native Private Selected
- Other Private
- Regional Corporation Selected (subsurface only)

Other Public Land Managers

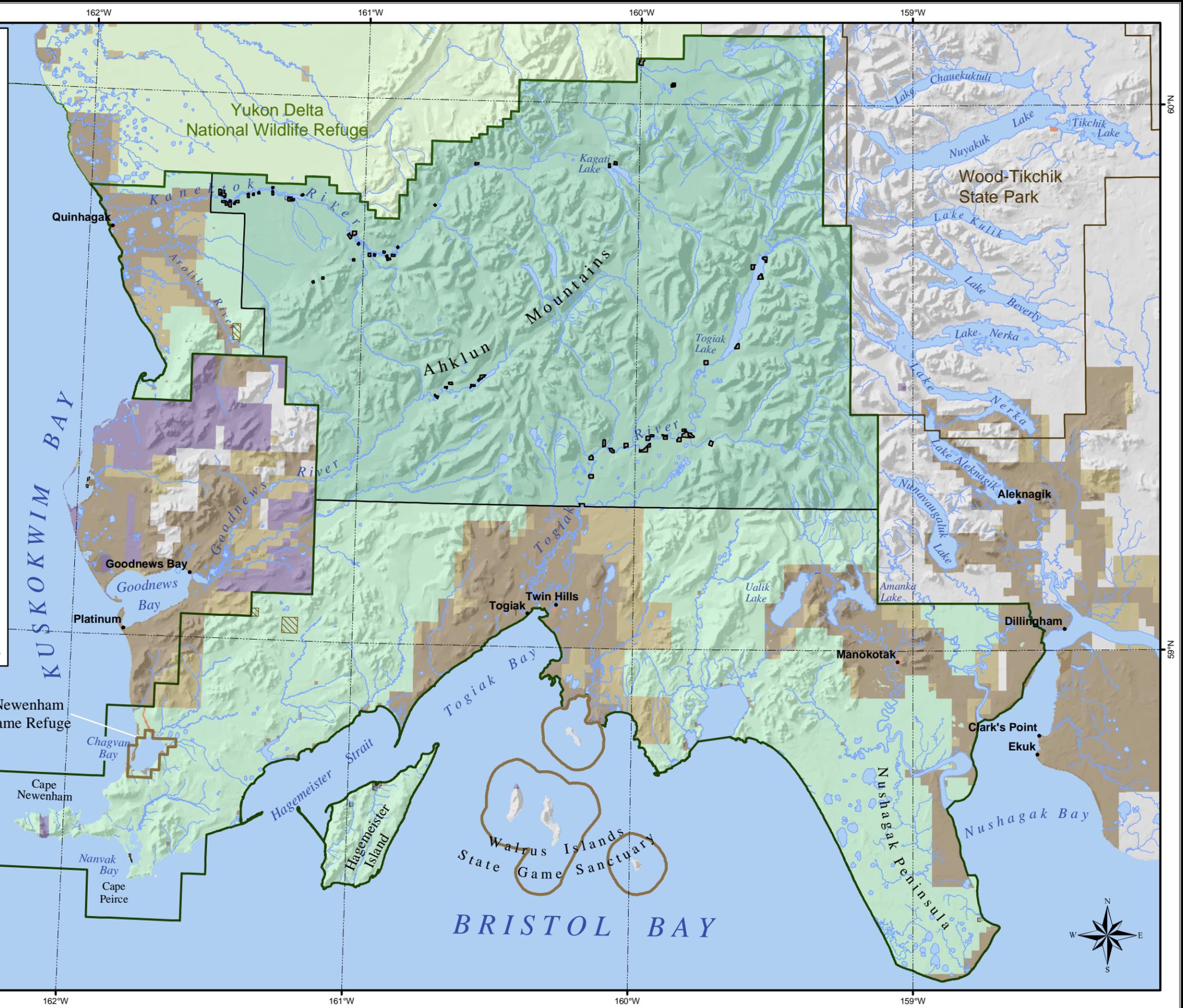
- Other Federal
- State Patent or TA
- State Game Refuge



Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeister Island (Alaska Maritime Refuge). Land status within Togiak Refuge boundary represents USFWS interpretation of BLM records, and is current to 5/2009. Land status outside Togiak Refuge boundary is section level data provided by the BLM. Small parcels may not be visible at this scale. This map does not address ownership of navigable waters or submerged lands.

14-0037



(Back of Figure 3-1)

do not currently understand. Alaska has experienced the largest regional warming of any state in the U.S. Temperature records for 25 stations across Alaska from 1949 to 1998 document seasonal mean temperature increases throughout the entire state. Seasonally, increases were highest in winter and spring and lowest in summer; fall was the only season in which slight decreases were observed. Much of this warming appears to have occurred during a sudden arctic atmospheric and ocean regime shift around 1977. Climate projections for Alaska suggest a continuation of the warming trends of recent decades. Changes are expected to be greatest during winter months. Because ice and snow have greater reflectivity, reduced snow and sea-ice extent reveals darker land and ocean surfaces, increasing absorption of the sun's heat and causing further regional warming. While northern and western Alaska may experience increases in precipitation, southeast Alaska may experience a decrease. Permafrost thawing is projected to accelerate under future warming, with as much as the top 30 feet of discontinuous permafrost projected to thaw by the end of the 21st century. The accelerated mass loss of Alaskan glaciers that began by the end of the 1980s is likely to continue into the future.

3.3.3 Landforms

A variety of landforms occur throughout the Refuge, including jagged peaks, cirque lakes, wide U-shaped valleys, broad coastal wetlands, and sea cliffs. The most prominent landforms are the Ahklun and Wood River mountains; the Kanektok, Goodnews, and Togiak river basins; and the coastal lowlands of the Nushagak Peninsula.

3.3.4 Geology and Soils

A variety of events have shaped the landscape, rocks, soils, and minerals of the area. All of these physical features in turn affect fish, wildlife, and their habitats. Over the last two million years, ice sheets repeatedly covered much of the Refuge. Glaciers scoured the broad U-shaped valleys of the Kanektok, Goodnews, and Togiak drainages.

The glaciers deposited silt, sand, gravel, cobbles, and boulders on the Refuge, commonly in unsorted glacial drift. Moraines appear in many places as broad ridges curving across modern drainages, in places damming lakes behind them. Water and wind have transported and formed surficial deposits. Alluvium, consisting of floodplain mud, silt, sand, gravel, cobbles, and boulders, is found along streams. Colluvium, mainly loose, frost-broken rubble, is present throughout the Refuge.

The parent materials for refuge soils vary considerably: along valleys and floodplains, the parent material consists of glacial gravel and outwash; on the uplands, it is decomposed bedrock and colluvium; and along most of the coastal areas, the parent material consists of silty alluvium.

Several deposits of valuable minerals lie within and near the Togiak Refuge boundary, with only a few on refuge administered lands. Most of these deposits are of gold, mercury, and platinum, with the majority found in the upper Arolik basin, the lower Goodnews River and its tributaries, and near the Salmon River.

One of the unique geological features found within the refuge boundary is a dormant tuya located northeast of the village of Twin Hills. A tuya is a low, flat-topped volcano that forms as the volcano erupts beneath a glacier. Because of the thick layer of ice above the volcano, lava flows extend outward, rather than building up the more familiar volcanic cone-shaped mountain.

According to Bureau of Land Management (BLM) resource assessments for the region, it is unlikely that there are oil or gas deposits within the Refuge. Portions of the Nushagak Peninsula and the northwestern area of the Togiak Refuge near Quinhagak (much of which is privately owned) have been classified as having low potential for hydrocarbons. However, these areas of low potential are thought to comprise volcanic deposits and/or igneous intrusions, which are not favorable for hydrocarbon generation and accumulation. The remaining refuge areas are classified as having no hydrocarbon potential (Gibson et al. 1988).

3.3.5 Water

Rivers and Lakes

Three major river systems (Kanektok, Goodnews, and Togiak rivers; see Figure 3-2) drain waters into Kuskokwim and Bristol bays. The Kanektok River (Figure 3-3) begins at Kagati Lake in the Ahklun Mountains and flows southwest for about 90 miles before emptying into Kuskokwim Bay. This river and its tributaries drain an estimated 870 square miles. The upper portions of the Kanektok River flow through a mountain valley, while the lower portion flows through flat tundra. Numerous gravel bars and islands occur along the length of the river, particularly where the channel meanders across the coastal plain.

The Goodnews River (Figure 3-4) consists of three river forks, which drain approximately 1,050 square miles. The North Fork flows from Goodnews Lake for approximately 25 miles before leaving the Togiak Refuge and an additional 22 miles before entering into Goodnews Bay. The Middle Fork is a 42-mile tributary that parallels the North Fork. The rivers have fine-to-medium gravel and cobble bottoms. Gravel bars and islands are not as numerous as on the Kanektok and are scarce when the water level rises. The South Fork is the shortest of the three forks at approximately 25 miles long.

The Togiak River (Figure 3-5) is the largest drainage basin in the Refuge, flowing southwestward from Togiak Lake about 55 miles before draining into Togiak Bay. This river's watershed covers an area of about 1,765 square miles. The river varies in size and depth, and is more than 500 feet wide in many places. The river is primarily a single channel, currents are swift, and occasional gravel bar islands are present. Five major tributaries drain into the Togiak River: the Gechiak, Pungokebuk, Nayorurun (Kashaiak), Kemuk, and Ongivinuck drainages.

Lakes in the Refuge range in size from potholes and beaver ponds to the 13-mile long Togiak Lake. About 70 percent of the lakes are less than 100 acres in size, and 22 percent range from 100 to 500 acres.

3.3.6 Water Quality

Waters within the Refuge are known for their clarity and unspoiled conditions. Nutrients in the water increase for periods of time as spawning salmon decompose and when snowmelt or rain increase runoff from marsh and tundra vegetation. Runoff in the region varies widely depending on changes in topography and climate conditions. Freeze-up on the Refuge usually occurs between late October and late November; break-up usually occurs in early to mid-May.

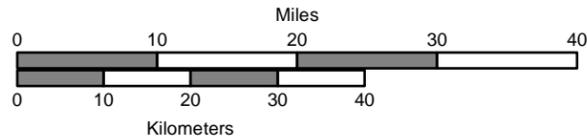
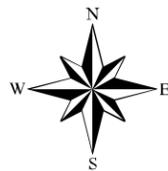
Pollution from litter, motors, petroleum products, previous mining, and human waste may also occur on the Refuge. The amount of pollution from these sources is of concern to people who live in and visit the Refuge.

Figure 3-2.
Major Drainages



Togiak National Wildlife Refuge

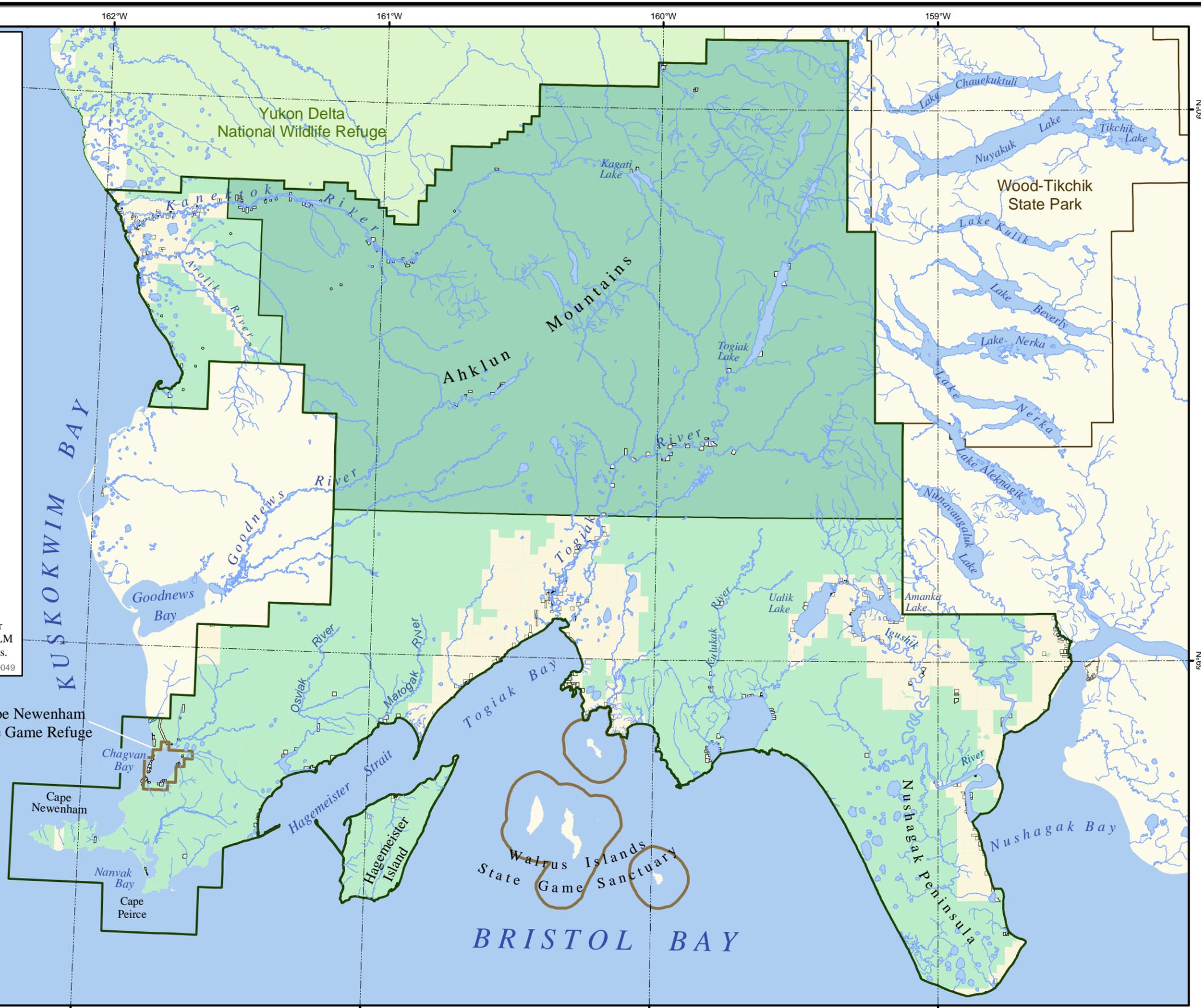
- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Yukon Delta National Wildlife Refuge
- Lands Not Administered by Togiak Refuge
- State Game Refuge



Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeister Island (Alaska Maritime Refuge). Land status represents USFWS interpretation of BLM records. This map does not address ownership of navigable waters or submerged lands.

14-0049



(Back of Figure 3-2)

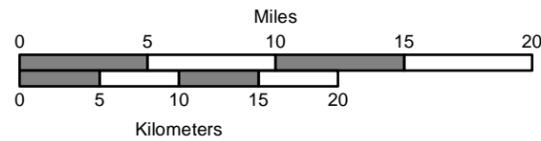
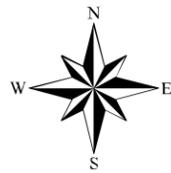
Figure 3-3.

Arolik / Kanektok Drainage



Togiak National Wildlife Refuge

-  Togiak Refuge - Minimal Management
-  Togiak Refuge - Designated Wilderness
-  Yukon Delta National Wildlife Refuge
-  Lands Not Administered by Togiak Refuge



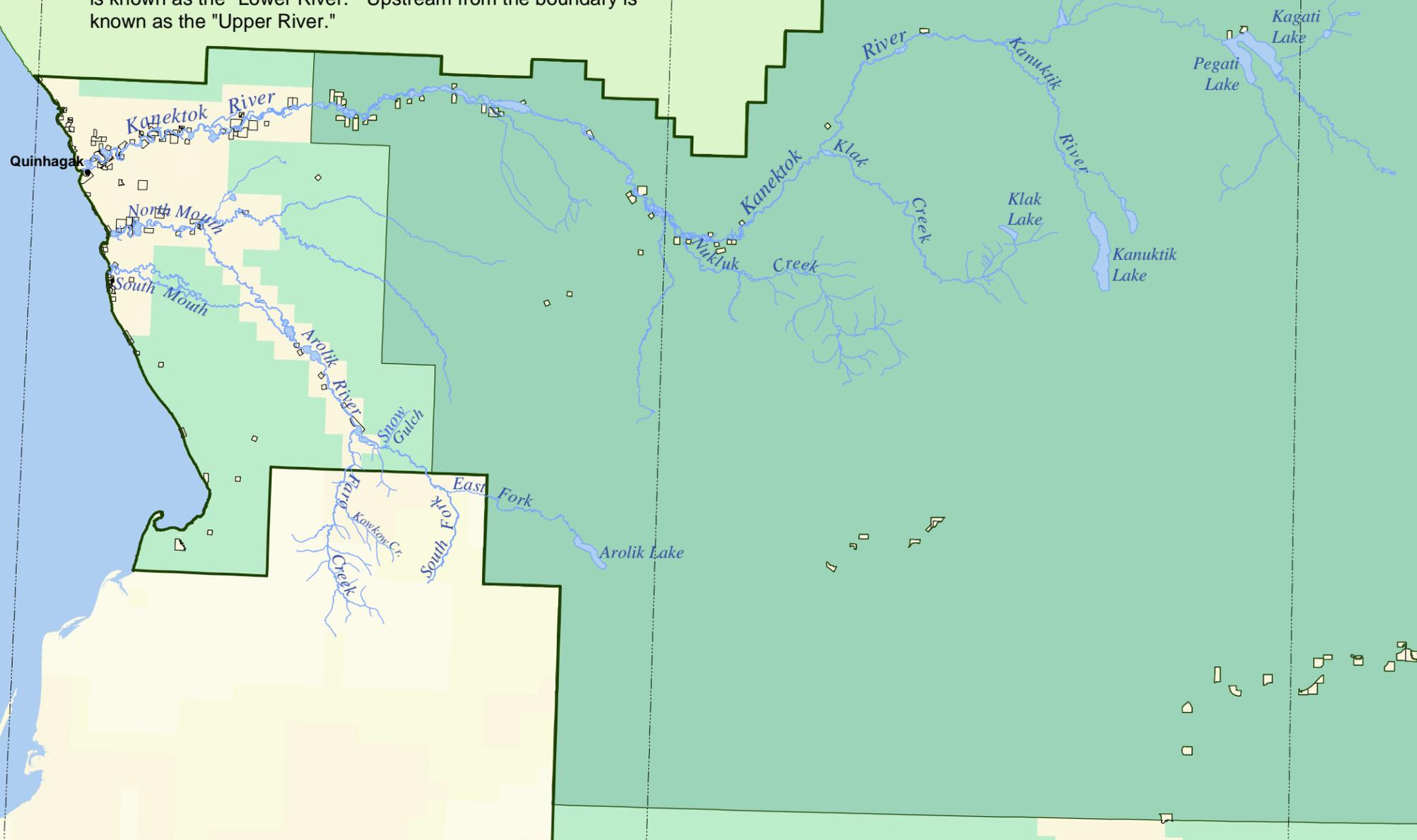
Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeister Island (Alaska Maritime Refuge). Land status represents USFWS interpretation of BLM records. This map does not address ownership of navigable waters or submerged lands.

14-0050

Yukon Delta National Wildlife Refuge

The Kanektok River downstream of the Wilderness Boundary is known as the "Lower River." Upstream from the boundary is known as the "Upper River."



Kuskokwim Bay



162°W

161°W

160°W

162°W

161°W

160°W

60°N

60°N

(Back of Figure 3-3)

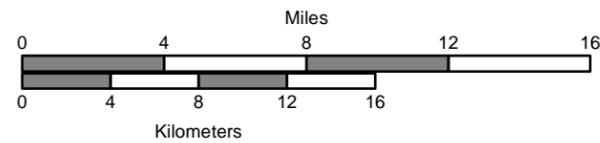
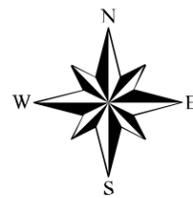
Figure 3-4.

Goodnews Drainage



Togiak National Wildlife Refuge

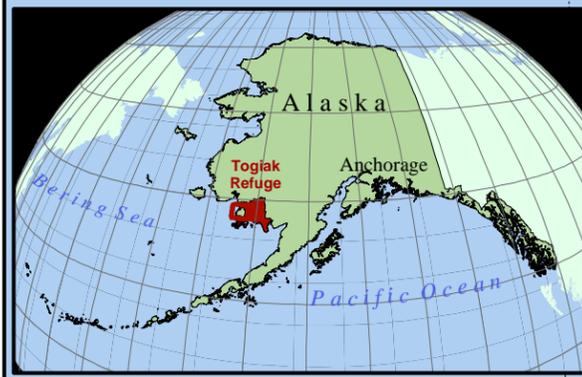
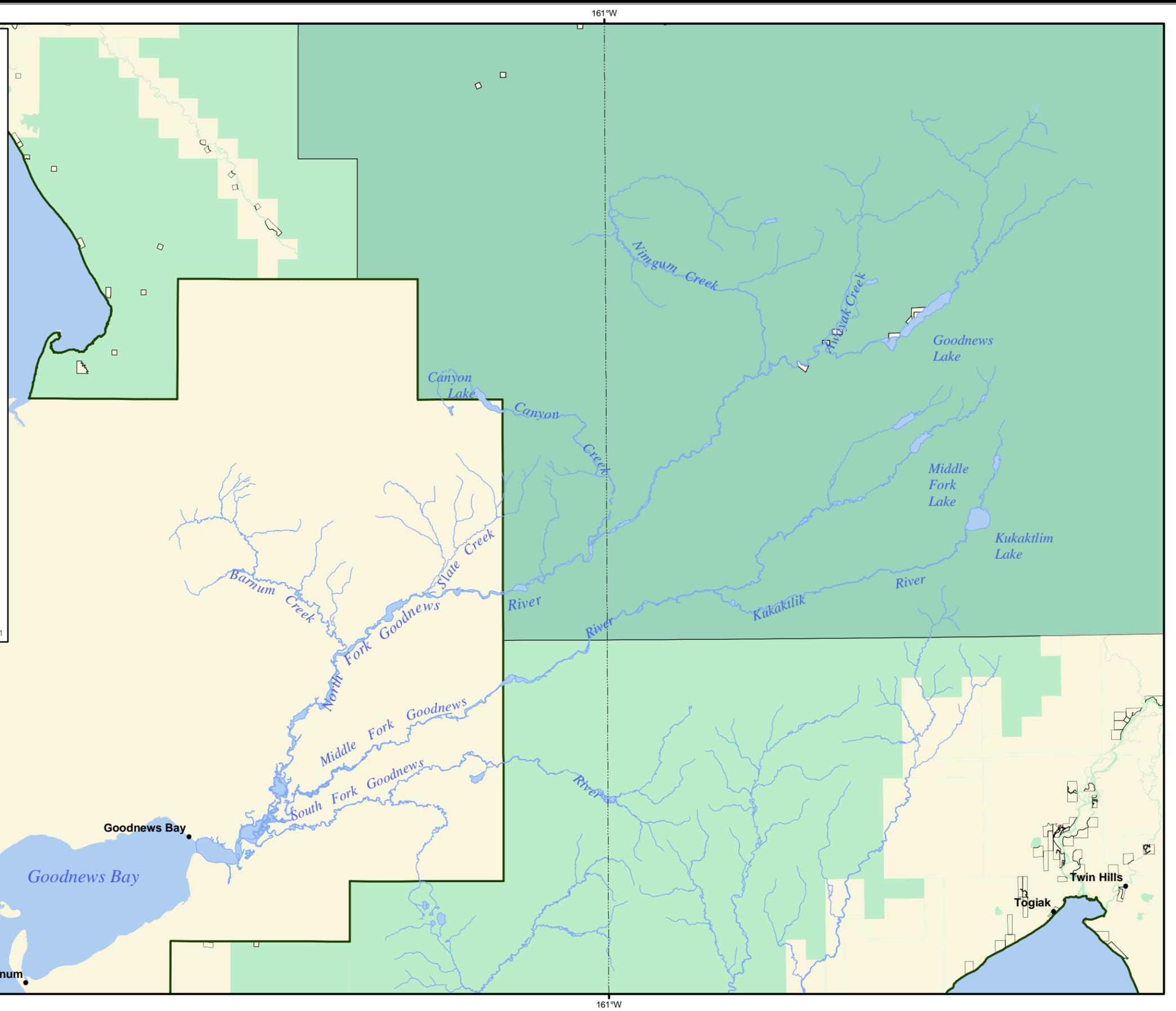
- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Lands Not Administered by Togiak Refuge



Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeister Island (Alaska Maritime Refuge). Land status represents USFWS interpretation of BLM records. This map does not address ownership of navigable waters or submerged lands.

14-0051



162°W

161°W

(Back of Figure 3-4)

Figure 3-5.
Togiak Drainage



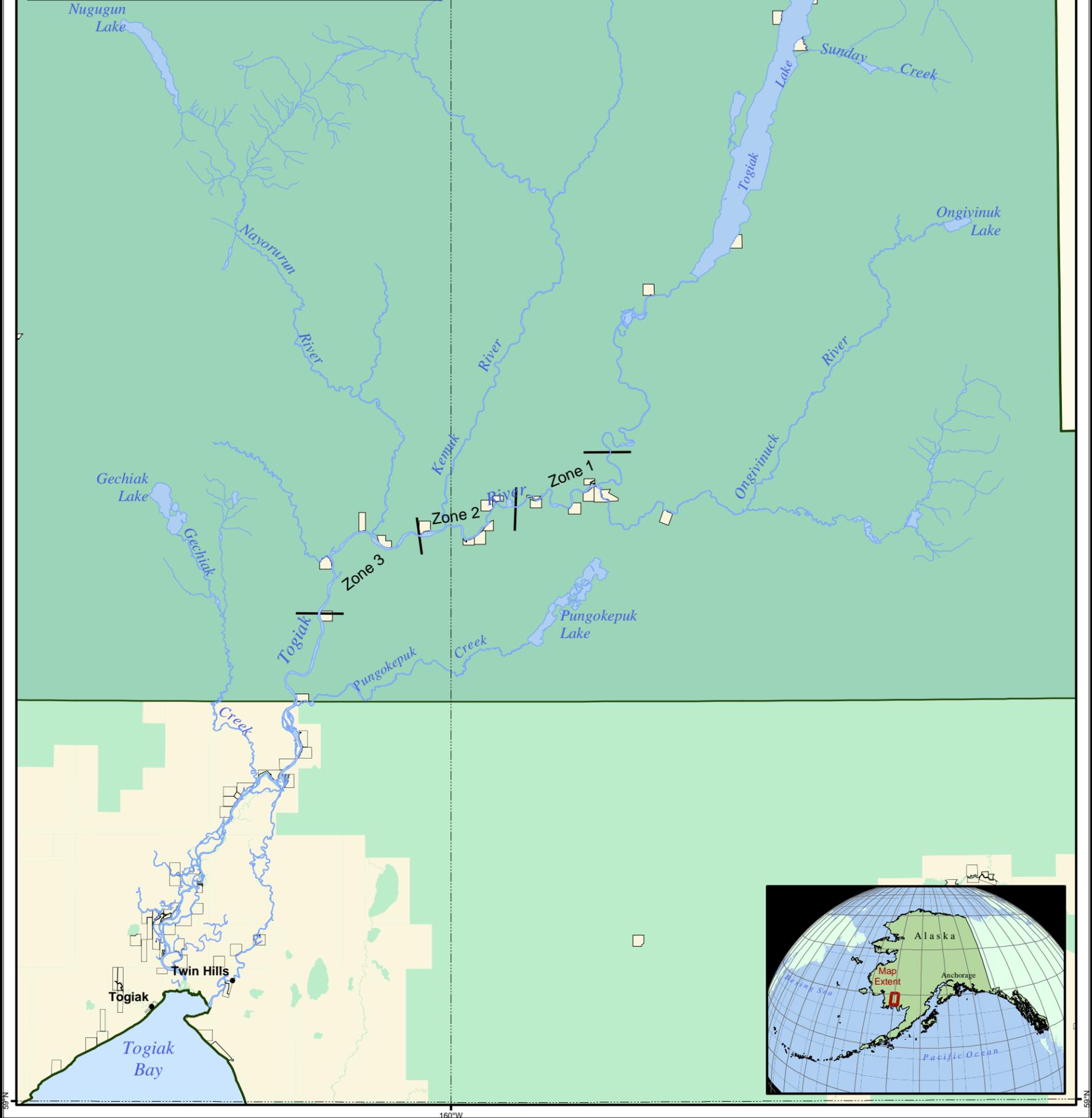
Togiak National Wildlife Refuge

- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Yukon Delta National Wildlife Refuge
- Lands Not Administered by Togiak Refuge
- Recreational Fishing Guide Use Zone Boundaries



Universal Transverse Mercator Projection - Zone 4, 1927 North American Datum.
 The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeyer Island (Alaska Maritime Refuge). Land status represents USFWS interpretation of BLM records. This map does not address ownership of navigable waters or submerged lands.

14-0052



Wood-Tikchik State Park

60°N

60°N

58°N

58°N

160°W

160°W

(Back of Figure 3-5)

Sampling efforts have collected baseline physical, biological, and chemical data for waters throughout the Togiak Refuge. Analyses indicate water quality remains high and has been affected very little by human activities (MacDonald 1996; Collins [unpublished] 2001).

Heavy Metal Contamination

Areas within and adjacent to the Refuge have a long history of mining and mineral extraction. One of the largest platinum deposits in the United States is located south of Goodnews Bay. These deposits are privately owned and have been actively mined sporadically during the past 100 years. Because parts of these operations have taken place upstream from waters within the Togiak Refuge, the possible contamination of these waters from heavy metals associated with mining and metal extraction are of concern.

In 1990, the Service conducted a study to determine the level of contaminants from platinum mining in the Salmon River. This study found no significant increases in samples collected from mined areas or from fish samples (Jackson 1990). Additional water quality sampling is being conducted in the area by BLM and ADF&G. There are very few data for other portions of the Refuge, and it is unknown whether natural mineral deposits and/or historic mining activities within or upstream of the Refuge have contributed heavy metals to watersheds within the Refuge.

Human Waste Contamination—Potential degradation of Togiak Refuge water quality due to improper disposal of human waste by visitors along the Kanektok, Goodnews, and Togiak rivers has been a concern for many years.

Waste from warm-blooded animals (including humans) contributes a variety of intestinal bacteria that are pathogenic to humans. Fecal indicator bacteria are used to assess the quality of water because they are correlated to the presence of several waterborne disease-causing organisms. The presence of *E. coli* in water is direct evidence of fecal contamination from warm-blooded animals and indicates the possible presence of pathogens (Dufour 1977).

In 1990, Togiak Refuge staff collected water samples from several sites throughout the Togiak Refuge and had these analyzed by a private laboratory in Anchorage, Alaska. These tests were conducted to identify and enumerate fecal coliform and fecal streptococci bacteria. Results indicate that these bacteria were present but at levels well below allowable Environmental Protection Agency (EPA) water quality standards for recreational waters. Lab reports ranged from 0 to 29 colonies per 100 ml of water at various locations throughout the Togiak Refuge (Collins [unpublished] 2001).

From 1996 through 2000 and again in 2002, the Native Village of Kwinhagak (NVK), collected water samples from various locations along the Kanektok River within the Togiak Refuge and below the wilderness boundary. NVK contracted a private laboratory in Anchorage to test for fecal coliform and enterococci bacteria. Tests were conducted throughout the summer use season and compared with estimated use of the Kanektok River from data collected by Togiak Refuge staff during the same time period. Results did not exceed EPA standards for recreational waters, although there continues to be local concern about water quality and increased levels of public use.

During the summer of 2001, additional water-quality samples were collected from the Kanektok River at the Togiak Wilderness Area boundary and analyzed by the Service. Results from these samples indicate that *E. coli* levels are very low and are at or below levels that occur in river systems with little or no human use (Collins [unpublished] 2001). Counts of bacterial colonies from samples collected ranged from 0 to 43 colonies per 100/mL.

Water quality is not the only concern regarding human waste disposal. The visual and aesthetic impacts are also a concern for all river users.

3.4 Biological Environment

3.4.1 Vegetation

The Refuge includes plants common to both arctic and subarctic regions. During the period of 1992 through 1995, more than 500 plant species were collected and documented representing 62 families and 202 genera. The major habitat type within the Refuge is moist tundra with low-growing shrubs, herbs, grasses, and sedges rooted in a continuous mat of mosses and lichens. Using satellite imagery, nine major cover types can be identified in the area. Table 3-1 lists these cover types and their estimated acreages.

Nonnative and Invasive Plants

There are at least 12 species of nonnative plants in eight taxonomic families occurring within the Refuge. Examples include dandelion (*Taraxacum officinale*) and clover (*Trifolium repens*). While these plants are not native, they generally do not spread rapidly and pose less risk to native habitats than noxious weeds and other invasive species found throughout North America.

Fire

Wildfires occur infrequently with approximately 12,000 acres burned from 1984 through 2009. Lightning and people are the most common causes of fire within the Refuge. Due to the mostly treeless landscape, these fires burn through the tundra relatively slowly.

Table 3-1 Estimated vegetation area by general cover type

Cover Type	Approximate Acres	Approximate Percentage Total Cover
Marine waters	217,185	5.0
Fresh waters	50,174	1.2
Barren ground	125,468	2.9
Grass and herbaceous marsh	25,313	.6
Peatland	805,402	18.6
Dwarf shrubland	1,065,193	24.6
Forest	7,610	0.2
Deciduous shrub	1,996,550	46.2
Snow, clouds, or light barren ground	28,617	0.7
Total	4,321,512	100.0

3.4.2 Fish and Wildlife

The geology and climate of the region influence the occurrence and diversity of vegetation and wildlife habitat within the Refuge. It is this diversity of habitats that supports the variety and abundance of wildlife found on the Refuge. Togiak Refuge is home to at least 283 species of wildlife, including 33 species of fish, 201 species of birds, 31 land mammal species, 17 marine mammal species, and 1 amphibian species.

Fish

Fisheries Data Collection--The ADF&G Sport Fish Division's mail survey is the primary tool used to monitor recreational fisheries within the Refuge. Salmon escapements to Togiak Lake, Amanka Lake, and the Kanektok, Middle Fork Goodnews, and Ongivinuck rivers are monitored by ADF&G and the Service by means of counting towers at Togiak and Amanka lakes, fish weirs on the Kanektok and the Middle Fork Goodnews rivers, and aerial surveys on approximately 12 additional rivers. In addition, on-site creel and fishery survey projects are conducted periodically on the most active recreational fisheries such as the lower Kanektok and Togiak rivers during the peaks of chinook and coho salmon runs. ADF&G also tracks commercial harvest and subsistence harvest each year. A subsistence permit is required for all Bristol Bay Management Area drainages, including the Togiak Bay area. Additionally, in the Kuskokwim drainage where subsistence use permits are not required, ADF&G annually conducts door-to-door surveys in all villages to collect subsistence salmon use information. When combined, these sources of information provide the most accurate estimates of fish harvest and escapement within the Kanektok, Goodnews, and Togiak River drainages.

We estimate the level of unguided angling effort by using trip reports that are required to be completed by air taxis for each group they transport to or from the Refuge. Commercial recreational fishing guides report the number of clients fishing in a particular area, the number of hours fished, and the number of each species caught and kept. For smaller fisheries guide use reports provide the most accurate estimate of guided angling effort, catch rates, and harvest.

Togiak Refuge River Rangers collect information on recreational and subsistence activities occurring on the Kanektok, Goodnews, and Togiak rivers. The information they collect, along with air taxi and guide reports, is used to determine "use days," which includes anglers and the number of guides and pilots accompanying them and even the camp staff present on the river. Direct observation and interviewing of recreational groups by River Rangers allows a breakdown between wilderness (upper river) and non-wilderness (lower river) levels of activity. This combination of data sources provides the most accurate and reliable estimates of the type and level of public uses occurring throughout the Kanektok, Goodnews, and Togiak river drainages.

Anadromous Fish

Anadromous fish are those species that migrate up rivers from the ocean to spawn in fresh water. There are several anadromous species that occur within the Refuge. Five species of Pacific salmon—chinook, sockeye, chum, pink, and coho—and Dolly Varden char migrate up the numerous rivers throughout the Bristol Bay and Kuskokwim Bay regions. These species are key components of the ecosystem, the economy, and people's lifestyles.

Salmon—The salmon runs that return to the Refuge are the single most important driving force behind the region's ecosystem and economy. Because of this, commercial harvest, escapement past the fishery into the rivers, recreational harvest, and subsistence harvest of this resource have been well studied and documented. The spawning population is considered to be the average estimated escapement; the returning population is based on the average total run estimate (escapement and harvest) for each species. From 1980 to 2008 (years where complete estimates are available), estimates of salmon bound for rivers within the Togiak Refuge showed the normal variability in abundance expected in wild fish stocks. Chinook, chum, and coho salmon are the primary targets for recreational salmon harvest in the refuge rivers. Chinook salmon initiate runs into the rivers throughout the refuge in

May with a peak in June and ending by August. Chum salmon run from June through August, and coho initiate runs in August and end in October.

Other than the environmental factors encountered during their life cycle (predation, environment, availability of food), the largest factor affecting salmon abundance in the waters within the Togiak Refuge is the regulated commercial harvest in the near-shore waters of the Bering Sea. This accounts for approximately 60 percent of the known run. Additional harvests by subsistence fishermen in both the rivers and the near-shore marine area accounts for less than two percent of the total run. The recreational harvest (those fish intentionally harvested or that are estimated lost as a result of the recreational fishery) consist of less than one percent of the run. ADF&G, along with the cooperation and support of the Service and other organizations, has carefully monitored the commercial, subsistence, and recreational harvests of salmon and has implemented management plans and other actions over the years to ensure that these salmon populations remain healthy and viable (Burkey et al. 2001, Weiland et al. 2001).

Char—Three species of char are found within the Refuge: Dolly Varden, Arctic char, and lake trout. Dolly Varden are an important component of the subsistence harvest and recreational harvest throughout the Refuge. Most streams and lakes with ocean access contain both Dolly Varden and Arctic char, and certain streams on Hagemeister Island also support Dolly Varden (Gwinn 2005). Arctic char have not been found on Hagemeister. Dolly Varden migrate down the Togiak, Kanektok, Goodnews, and other rivers in late May. They reside in near shore marine areas and return to freshwater during July through September to spawn and overwinter. Dolly Varden do not necessarily return to their home waters to overwinter. Some fish may migrate from the ocean into one stream to spawn and then migrate back to the ocean and enter a different river to overwinter, usually in a lake. This complex life cycle means it is very difficult to determine population size or trends, or estimate likely effects of recreational and subsistence fisheries. Recent genetic research strongly suggests tributaries of the Togiak River support genetically distinct populations of Dolly Varden (Crane et al. 2003).

More Dolly Varden are caught in the recreational fishery than any other species in the Kanektok, Goodnews, and Togiak rivers. When the recreational and subsistence catch and harvest data are combined, it suggests populations are supporting large catches and annual average harvests of tens of thousands of fish for each of these three rivers (USFWS 1990; BBNA and ADF&G 1996; Dunaway and Sonnichensen 2001).

Resident and Freshwater Fish

Resident, or freshwater fish, are another important component of the ecosystem. Arctic char, rainbow trout, Arctic grayling, lake trout, northern pike, burbot, blackfish, and round whitefish are considered resident fish. These fish rely on the supply of nutrients that salmon bring from the ocean, nutrients that are consumed either by eating loose salmon eggs as they float downstream or by eating insects that have fed on dead salmon carcasses. In turn, these resident fish provide an important source of food for raptors (e.g., osprey and bald eagles), other fish (e.g., lake trout and northern pike), and local people who catch these fish year-round.

Rainbow Trout—Rainbow trout are found in most waters within the Togiak Refuge, with major concentrations occurring in the Togiak, Goodnews, Kanektok, and Arolik river systems. Populations appear to be stable, but it is possible the average size of fish in the Kanektok and Goodnews river populations has decreased. These results may represent

normal fluctuations in population structure, variations in sampling methods, or effects due to a fishery (Adams 1996).

Arctic Char—Little is known about these resident char within the Refuge except that they are most common in headwater lakes, in deep pools, and in mainstream rivers, and they spawn in lake tributary streams.

Lake Trout—Lake trout are known to exist in several deep lakes throughout the Togiak Refuge but primarily in the Kuskokwim drainage. Lake trout live and spawn in these lakes and are not known to migrate. There are very few data about lake trout populations within the Refuge. Between 2,000 and 7,000 lake trout were estimated to be in Kagati Lake during a 1989 and 1990 tagging study (Fair 1995; Lisac and MacDonald 1995).

Arctic Grayling—The majority of streams within the Refuge contain Arctic grayling. Annual movements between spawning, feeding, and wintering sites may be extensive. Juvenile and adult grayling migrate upstream just before or during spring break-up. Before freeze-up on the tributaries, Arctic grayling are thought to migrate to lakes and spring areas to overwinter.

Northern Pike—Northern pike are an important subsistence fish caught primarily through the ice on lakes throughout the Togiak Refuge. Many of the rivers, creeks, lakes, and ponds in watersheds on the Bristol Bay side of Togiak Refuge support northern pike. However, northern pike are less abundant in waters on the Kuskokwim Bay side of Togiak Refuge. Northern pike winter in lakes and near springs in rivers and creeks where the danger of oxygen depletion is minimal. As soon as the ice breaks up, the northern pike move inshore or upstream to marshy areas to spawn. Northern pike spend the summer and fall in the warm, slow-moving water of shallow lakes and meandering rivers. Little information is available for populations within the Refuge, but they appear to be healthy and possibly expanding, according to local residents.

Kanektok and Arolik River Fisheries

The Refuge conducted a subsistence harvest survey in Quinhagak to collect harvest data on resident fish species (USFWS 1990). Of 84 households interviewed, 79 percent (66 households) reported harvesting fish other than salmon. Expanding these interview results to the 140 households in Quinhagak gives a rough estimate of a subsistence harvest for that year of 7,625 Dolly Varden and Arctic char, 2,585 rainbow trout, 543 Arctic grayling, and 22 lake trout.

Since 1983, when effort estimates were first available, participation in the recreational fishery increased rapidly to peak in 1988 (Figure 3-6). Approximately 60 percent of the total recreational fishing effort occurs on the lower 20 miles of the Kanektok River, where anglers target chinook, chum, and coho salmon (Dunaway and Bingham 1992; Dunaway and Fleischman 1995). The upper 70 miles of the river primarily support recreational angling for rainbow trout, Arctic grayling, Dolly Varden, lake trout, and Arctic char.

Catches (including all fish released or harvested) of Dolly Varden and Arctic char from the Kanektok River are the largest among the non-salmon fish species, with an annual average recreational catch of more than 20,000 fish (Lafferty 2004). From 1996 through 2002, the seven-year average annual catch of other resident species was 11,684 rainbow trout, 120 lake trout, and 4,074 Arctic grayling. A small portion of the overall catch is actually harvested (killed). The seven-year average recreational harvests for 1996–2002 were 529 Dolly Varden and Arctic Char, 62 rainbow trout, 22 lake trout, and 59 Arctic grayling annually.

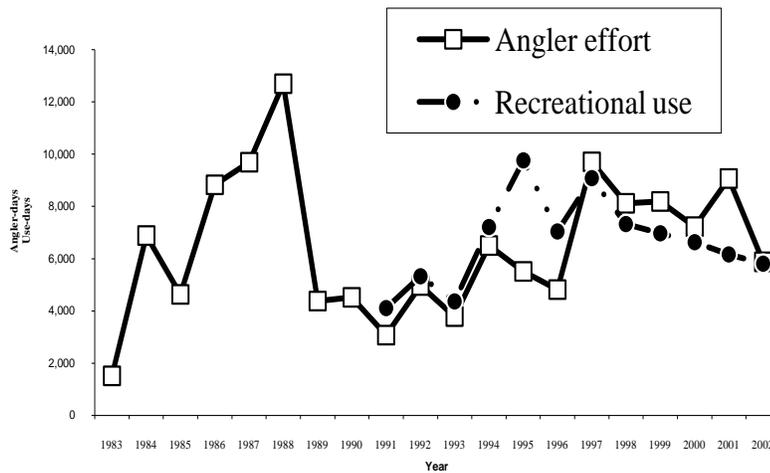


Figure 3-6. Kanektok River angler effort (USFWS 1991–2002; Lafferty 2004)

Studies conducted by the Service, ADF&G, and others have indicated that the impact of recreational and subsistence fisheries has the potential to change the length structure of rainbow trout populations in the Kanektok River (Adams 1996) and other rivers. The State of Alaska Board of Fisheries took action to reduce impacts of recreational fishing of rainbow trout in 1990 and in 1997 under the Southwest Alaska Rainbow Trout Management Plan. Recreational fishing for rainbow trout in the Kanektok River is restricted to catch-and-release only from June 8 through October 31, and tackle is restricted to unbaited artificial lures with a single hook. These actions are intended to reduce the potential for dramatic changes in the age structure of rainbow trout. Ongoing monitoring of fish populations should be adequate to detect and suggest necessary change to the management of these fish.

Available information suggests subsistence harvest represents the majority of rainbow trout mortality in the Kanektok River drainage. In 1990, the Service estimated rainbow trout harvest by Quinhagak residents was in excess of 2,000 fish. Using a maximum of 12 percent catch-and-release mortality (Taylor and White 1992) and the 1991 ADF&G recreational fishing estimates reported by Dunaway and Sonnichsen (2001) of 5,856 rainbow trout caught and 182 fish harvested, total annual mortality due to recreational fishing would be no more than 863 fish. This represents a maximum, and a catch-and-release mortality rate of three to five percent is probably more realistic for Kanektok River rainbow trout.

Goodnews River Fisheries

The Alaska Department of Fish and Game has estimated recreational catch of rainbow trout on the Goodnews River since 1991 (Figure 3-7). Estimated catch was variable from 1991 (2,776) through 2002 (2,915), ranging from a low of 945 in 1994 to a high of 9,703 in 1997. The 1996–2002 annual average recreational harvest of rainbow trout was approximately 103 fish (Lafferty 2004). Analyses of data collected indicate changes in the Goodnews River rainbow trout populations are similar to those described for the Kanektok River (Adams 1996). In her paper, Faustini (1996) suggested a change had occurred in the historic length-frequency and may be the result of recreational fishing harvest, recreational fishing hooking mortality, and subsistence fishing harvest.

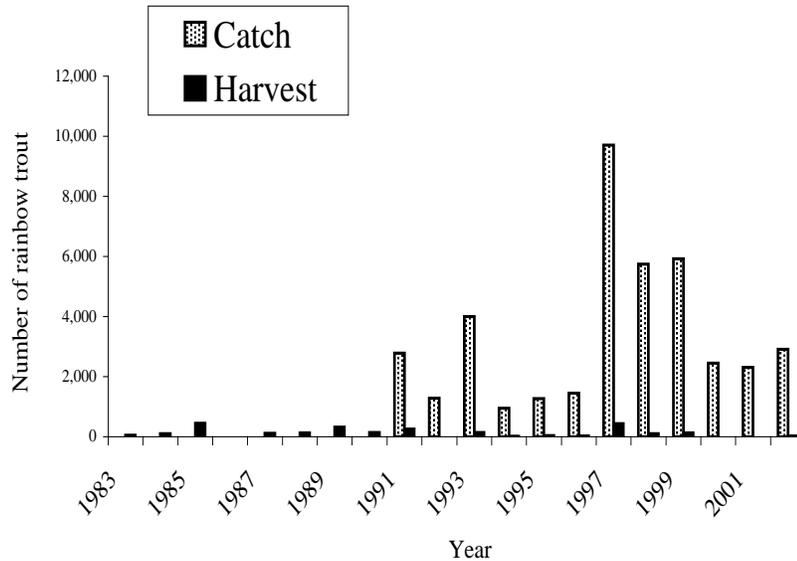


Figure 3-7. Goodnews River rainbow trout sport fishery harvest and catch (Lafferty 2004)

Other estimated annual average recreational catches from 1996–2002 include 14,462 Dolly Varden and Arctic char, 227 lake trout, and 2,271 Arctic grayling. Annual average harvests during this same time period were 633 Dolly Varden and Arctic char, 16 lake trout, and 73 Arctic grayling. Similar estimates for subsistence harvest are not available.

Togiak River Fisheries

Dolly Varden and Arctic char have been captured in all tributaries of the Togiak River with the greatest concentrations being in the Izavieknik River (Lisac and MacDonald 1996; Lisac and Nelle 2000). More of these fish are caught in the recreational and subsistence fisheries than are any other species in the Togiak River. A household survey of Togiak area residents estimated the harvest of several non-salmon species of fish in 1994–1995 (BBNA and ADFG 1996) and in 1999–2000 (Coiley-Kenner et al. 2003). Estimated numbers of individuals harvested are shown in Table 3-2.

Table 3-2 Estimated subsistence harvest of non-salmon fish from the Togiak River during 1994–1995 and 1999–2000

Fish species	Estimated Number of Fish Harvested	
	1999–2000	1994–1995
Arctic grayling	50	124
Northern pike	593	1285
Dolly Varden and Arctic char	4,087	10,847
Lake trout	107	270
Rainbow trout	29	897
Whitefish	4,599	9350

Recreational catch estimates for the Togiak River have increased from 1994 through 1998, with a five-year average catch of 3,837 Dolly Varden and Arctic char (Dunaway and Sonnichsen 2001). It is unknown whether this is the result of angler preference, angler effort, or increases in stock abundance. Of the more than 3,800 Dolly Varden and Arctic char caught, an annual average of 437 fish was harvested by recreational anglers during this time period.

Rainbow trout were not found to be present upstream of the Togiak Lake outlet and were primarily concentrated in lower tributaries (Lisac and MacDonald 1996). From 1993 through 1995, the Togiak Refuge conducted baseline fisheries inventories on Togiak River tributaries; these inventories provided the first documentation of age, weight, length, and species distribution for rainbow trout, Arctic grayling, northern pike, Dolly Varden, and Arctic char in the Togiak area (Lisac and MacDonald 1996). Recaptures of marked fish have shown movements of rainbow trout between the tributary streams and the main Togiak River, and additional work in 1998 and 2000 demonstrated rainbow trout in Gechiak and Pungokepuk creeks are distinct populations that overwinter in headwater lakes (Nelle and Lisac 2001; Krueger et al. 1999).

Recreational anglers caught an increasing number of rainbow trout during the 1990s. From 1994 through 1998, the average annual catch was about 1,900 trout, but most of these fish were released. The estimated average harvest during this time period was less than 25 fish per year (Dunaway and Sonnichsen 2001).

3.4.2.2 Birds

Waterfowl—The Refuge and the Cape Newenham State Game Refuge (of which Chagvan Bay is a primary feature) are host to a wide variety of migratory and resident waterfowl. Lakes, rivers, tundra ponds, and coastal wetlands combine to offer nourishment and resting areas for staging, breeding, and molting waterfowl. Major areas of importance include the Nushagak Peninsula, Kulukak Bay, Osviak Slough, Nanvak Bay, Chagvan Bay, Carter Bay, and Jacksmith Bay. A large portion of the world's black brant population feeds or rests on Nanvak and Chagvan bays during migration. A large portion of the North American west coast populations of emperor geese, and king and Steller's eiders migrate through or adjacent to the Refuge. Significant numbers of common eiders, harlequin ducks, and black scoters also stop in the area. Less common, but still abundant, are migrating greater scaup, long-tailed ducks, and red-breasted mergansers. The Refuge also provides nesting habitat for several waterfowl and water bird species, including tundra swans and Canada geese. Common nesting species are mallard, northern pintail, green-winged teal, greater scaup, common eider, harlequin duck, black scoter, common merganser, and red-breasted merganser. Nesting populations in the lowlands of the Nushagak Peninsula and north of Goodnews Bay have been estimated at 31 ducks and 1.3 tundra swans per square mile (USFWS 1990).

One species of particular concern is the harlequin duck. The low reproductive success and specialized habitat requirements of harlequin ducks make them particularly vulnerable to human disturbance (Genter 1992). They appear to be most sensitive to disturbances during the early stages of nesting (Clarkson 1992). Public use levels within the Togiak Refuge are low or nonexistent during the sensitive early stages of nesting. There is no evidence that harlequin duck abundance has been negatively impacted on the Togiak, Goodnews, and Kanektok rivers.

Marsh and Water Birds—A large portion of the North American west coast population of Pacific loons migrates past the Refuge. Red-throated, Pacific, and common loons nest on the Togiak Refuge, as do red-necked and horned grebes. Based on their 1983 surveys, Pogson

and Cooper (1983) concluded nesting densities of sandhill cranes on the Nushagak Peninsula are among the highest recorded in Alaska.

Shorebirds—At least 39 species of shorebirds use the bays and lowlands of the Refuge as staging areas enroute to and from the arctic. Eighteen species of shorebirds have been documented breeding on the Togiak Refuge, with the most common nesters being semipalmated plovers, greater yellowlegs, spotted sandpipers, western sandpipers, least sandpipers, common snipe, and red-necked phalaropes. Nushagak Bay's importance to shorebirds resulted in its designation as a regional site in the Western Hemisphere shorebird reserve network because at least 60,000 shorebirds have been documented in this area at one time.

Marine Birds—Cape Newenham, Cape Peirce, Bird Rock, and Shaiak Island support the largest population of cliff-nesting birds in the eastern Bering Sea mainland. The birds nest and roost on the ledges and in the cracks of the cliff faces, and they forage at sea. The two most common species are the common murre and black-legged kittiwake. Other common species include tufted and horned puffins, pelagic and double-crested cormorants, parasitic and long-tailed jaegers, glaucous and mew gulls, pigeon guillemot, and parakeet auklet. Several hundred Aleutian terns nest in Goodnews Bay, and Arctic terns are abundant throughout the Togiak Refuge. The population and productivity of black-legged kittiwakes, common murres, and pelagic cormorants have been monitored annually at Cape Peirce since 1984.

Cliff-nesting seabirds along the coastline of the Refuge are affected by human-induced and natural disturbances that may reduce their breeding performance. Ecological factors relating to forage food availability, climatological factors, and predation can also affect breeding performance. Disturbances to seabirds are especially critical during times of egg laying, incubation, and chick rearing, when disturbances may cause flushed adults to dislodge eggs or chicks so that they fall to their demise. For these reasons, potential human disturbance is of particular concern.

Marine bird eggs are an important subsistence resource with gull and murre eggs most commonly gathered. It is estimated more than 10,000 eggs are gathered annually by residents of Togiak, Twin Hills, and Manokotak (Coiley-Kenner et al. 2003). Similar harvest estimates by Quinhagak, Goodnews Bay, and Platinum residents are not available.

Raptors—At least 21 species of raptors are known to occur on the Togiak Refuge, with 16 species known to breed here. The most common are bald eagles, northern harriers, rough-legged hawks, merlins, and short-eared owls. In addition, golden eagles, gyrfalcons, peregrine falcons, and northern hawk owls are seen every year.

Because bald eagles are a highly visible species found mainly in association with aquatic habitats, they are more vulnerable than many other species to human disturbance, especially at nest areas (Anthony et al. 1982). This sensitivity varies among individuals, but generally adult eagles are more sensitive during courtship, egg laying, and incubation, with sensitivity decreasing as young develop (Fraser 1981). Public use along rivers, including boating, camping, or fishing near nesting areas, can be a major disturbance and can alter normal raptor activity patterns by altering the distribution of raptors, disrupting nest attentiveness patterns, causing abandonment of breeding territories, reducing productivity, and affecting foraging (Knight and Skagen 1986).

Bald eagle occupancy and productivity surveys have been conducted annually on Togiak Refuge since 1983. These surveys indicate that approximately 80 to 90 breeding pairs

inhabit the refuge, with the population remaining relatively constant over time. A new peer-reviewed survey protocol was recently developed that should provide better population estimates in the future. Since data from the 2009 survey have yet to be analyzed, no new estimate of bald eagle numbers can be provided at this time.

Upland Birds—Spruce grouse and willow, rock, and white-tail ptarmigan all occur on the Togiak Refuge, and each is a confirmed breeder. Willow ptarmigan are the most common of these species, with flocks of several hundred or more birds occurring. Rock ptarmigan are found on mountain slopes throughout the Togiak Refuge, while spruce grouse occur on the eastern boundary of the Togiak Refuge where coniferous trees are found. These birds are an important subsistence resource throughout the Refuge, with several thousand harvested each year (Coiley-Kenner et al. 2003).

Passerines—The diverse habitats on the Refuge support a variety of landbird species. Numerous species common throughout the Refuge include alder flycatchers; black-billed magpies; common ravens; tree swallows; blacked-capped chickadees; Arctic warblers; gray-cheeked and hermit thrushes; American robins; yellow wagtails; orange-crowned, yellow, blackpoll, and Wilson’s warblers; northern water thrushes; Savannah, fox, and golden-crowned sparrows; Lapland longspurs; and common redpolls. Other landbird species that are common in certain habitats scattered throughout the Togiak Refuge are bank and cliff swallows; ruby-crowned kinglets; Swainson’s and varied thrushes; American pipits; yellow-rumped warblers; American tree and white-crowned sparrows; snow buntings; and gray-crowned rosy finches. Togiak Refuge participates in various local, regional, and global monitoring efforts for landbirds, which include breeding bird surveys, area searches, checklists, and public bird counts.

Land Mammals

Caribou—Several significant changes in caribou migration, population, and distribution have occurred since the original Togiak Refuge Plan was completed in 1985. At that time, there were seldom more than 50 caribou on the Togiak Refuge at any given time, despite the fact there was suitable habitat available (USFWS 1985). Caribou were abundant in the Nushagak, Togiak, and Yukon-Kuskokwim deltas prior to 1900 (ADF&G 1973; ADF&G 1976) but were eliminated from the area by over harvesting, competition with introduced reindeer herds, wildfire, or a possible shift in migration patterns (ADF&G 1973). A small remnant herd remained to the north of the Togiak Refuge in the Kilbuck Mountains, possibly because of the optimum habitat and the inaccessibility of the area to hunters (Skoog 1968). In 1980, the Kilbuck or Quailnguut herd was estimated to be at least 50 animals; more accurate surveys in the mid-1980s showed the population to be 200–300 caribou. By 1995, the population had grown steadily to more than 4,000 animals, and more caribou were being counted within the Togiak Refuge (Quailnguut [Kilbuck] Caribou Herd Cooperative 1995; Miller 1995).

In the early 1980s, the range of another, much larger herd known as the Mulchatna herd was beginning to shift westward toward the Kilbuck herd and the lower Yukon-Kuskokwim Delta (Shepherd 1981). A large influx of Mulchatna caribou in the winter of 1994 may have contributed to the 1995 Quailnguut (Kilbuck) population estimate. Near the end of 1994, approximately 30,000 caribou from this Mulchatna herd migrated through the area in which the Quailnguut herd lived. As these caribou left, most of the Quailnguut herd went with them. This was the first known migration of Quailnguut caribou from their traditional range in the Kilbuck Mountains into areas that were traditionally used by the much larger Mulchatna herd (Quailnguut [Kilbuck] Caribou Herd Cooperative 1995). It is debatable whether or not the Quailnguut caribou herd still exists as a separate herd. The Mulchatna

herd was estimated to be approximately 200,000 animals in 1996 (ADF&G 1999). However, since 1996, it has steadily declined in numbers. In 2006, it was estimated at 45,000 animals. This herd often moves through the Togiak Refuge, especially near the upper Kanektok, Goodnews, Arolik, and Togiak rivers. Surveys have estimated as many as 30,000 caribou wintering in the Togiak Drainage (USFWS 2000). The migration of this herd ranges from the lower Kuskokwim River, east to Lake Illiamna, south toward the lower Nushagak and Kvichak rivers, and north to the area near McGrath.

In the southeastern portion of the Togiak Refuge, another change in caribou populations occurred in 1988. To more quickly restore caribou populations to their historic level, 146 barren ground caribou were reintroduced to the Nushagak Peninsula in 1988. Because of exceptional range conditions, low predation, and closed season, this herd grew to more than 1,000 animals by 1993. In 1995, a limited Federal subsistence hunt was allowed and is estimated to be removing 3 percent of the population each year (Collins et al. 2003).

Management of this caribou herd is conducted through the Nushagak Caribou Herd Management Plan (USFWS 1994). Until February 2000, most individuals in this herd resided entirely on the Nushagak Peninsula, the exception being a small group of animals inhabiting the area between Twin Hills and the Kulukak River. More recently, temporary movements off the Nushagak Peninsula by a majority of the herd occurred on at least four occasions. Lichen utilization by caribou has become more noticeable, especially in the southern half of the peninsula. Population counts indicate the herd peaked around 1,300 animals in 1998–1999 (Aderman and Woolington 2001) and then declined to less than 1,000 by 2003 and then declined to approximately 550 from 2007 to 2009. Caribou from the Mulchatna herd move through and seasonally occupy many areas within and adjacent to the Refuge. In response, the Federal Subsistence Board and Alaska Board of Game have greatly expanded subsistence and recreational hunting opportunities. In addition, the Nushagak Peninsula caribou herd has also provided expanded subsistence hunting opportunities. Beginning in the mid-1990s, this herd became an important subsistence hunting resource to residents from Manokotak and Dillingham primarily, and secondarily to residents of Aleknagik, Clarks Point, Togiak, and Twin Hills. This use persisted until 2006, at which time the caribou population had declined in number to a point at which hunting was significantly reduced.

Interviews with residents of Togiak, Twin Hills, and Manokotak indicate the combined total harvest (which included caribou taken from both within and outside the Togiak Refuge) from these three communities during the 1999–2000 hunting season was approximately 333 animals (Coiley-Kenner et al. 2003). Comparable information was not available for Quinhagak, Platinum, Goodnews Bay, and other communities adjacent to the Refuge.

Moose—Little written information is available about moose abundance on the Togiak Refuge prior to the 1970s. Generally, it is believed moose populations have historically been at low densities in areas of southwestern Alaska and that moose populations have expanded their range and increased in number in this region during the 20th century (Machida 1987; Van Daele 1992).

In 1981, the first major survey of Game Management Unit (GMU) 17A, (see Figure 3-8) the majority of which is within the Togiak Refuge, was conducted. During five and one-half survey hours, only three moose were observed, resulting in the Alaska Board of Game's decision to close the hunting season. When the first Togiak Refuge Plan was written in 1985, it was estimated that fewer than 35 moose lived within the Togiak Refuge (USFWS 1985). Through the 1980s, ADF&G aerial surveys indicated moose numbers along the eastern edge of the Togiak Refuge (Unit 17C) continued to increase, while just to the west in Unit 17A,

densities remained low despite the availability of suitable habitat (Taylor 1990). Illegal harvest was thought to be the principal reason for the low moose population in Unit 17A (Taylor 1990; Van Daele 1993; Jemison 1994). In 1990, winter hunting in western Unit 17C was eliminated in an effort to promote moose expansion into Unit 17A. In the mid-1990s, aerial surveys confirmed large increases in the number of moose in the Togiak and Kulukak River drainages (Jemison 1994; Aderman et al. 1995). Table 3-3 shows the results of various surveys conducted in Unit 17A.

Table 3-3. Number of moose observed during aerial counts within Game Management Unit 17A

Year	Number of Moose
1992	6
1994	84
1995	136*
1997	234
1998	429
1999	511
2002	652
2004	777
2005	1023
2006	1023
2008	1070

*estimate based on survey

The dramatic increase in numbers is attributed to a number of situations, including continued immigration from neighboring GMU 17C; regulation changes implemented by the Alaska Board of Game; an apparent reduction of illegal harvests as a result of poor travel conditions and changing attitudes of local residents; the availability of the expanding Mulchatna caribou herd in GMUs 17 and 18 for subsistence; and good productivity and survival of GMU 17A moose due to mild winters, few predators, and pristine habitat (Aderman et al. 1998; Aderman et al. 1999; Aderman et al. 2000).

Figure 3-8.

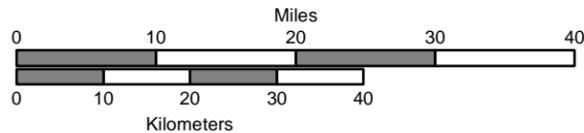
Game Management Units



Togiak National Wildlife Refuge

- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Yukon Delta National Wildlife Refuge

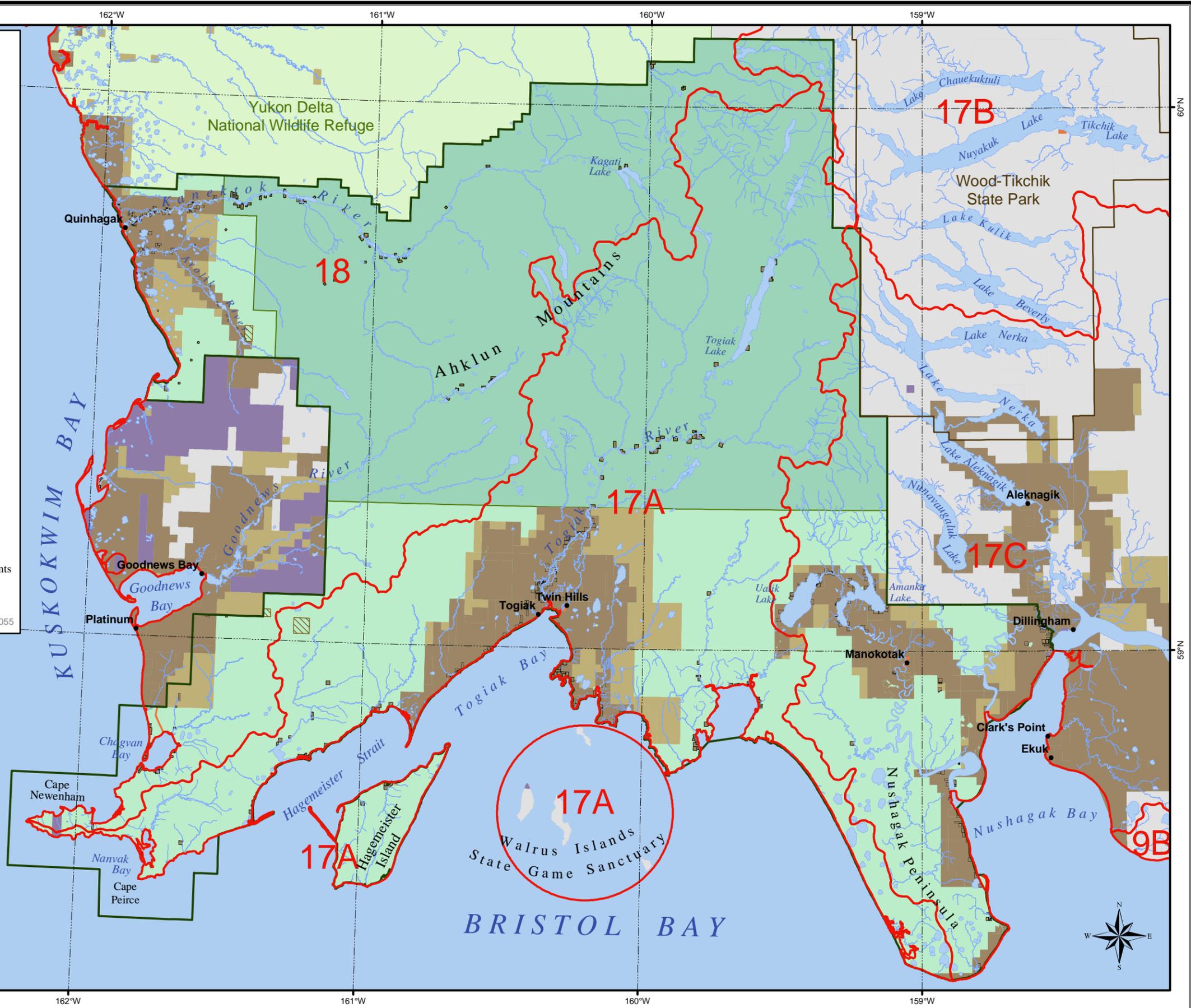
- | Private | | Other Public Land Managers | |
|---------|---|----------------------------|--------------------|
| | Native Private Fee | | Other Federal |
| | Native Private Selected | | State Patent or TA |
| | Other Private | | |
| | Regional Corporation Selected (subsurface only) | | |



Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeister Island (Alaska Maritime Refuge). Land status within Togiak Refuge boundary represents USFWS interpretation of BLM records, and is current to 5/2009. Land status outside Togiak Refuge boundary is section level data provided by the BLM. Small parcels may not be visible at this scale. This map does not address ownership of navigable waters or submerged lands.

14-0055



(Back of Figure 3-8)

In the fall of 1997, hunting was reestablished in GMU 17A, and hunters reported harvesting 15 moose. Interviews with residents of Togiak, Twin Hills, and Manokotak indicate the combined total harvest (which included moose taken from within and outside the Togiak Refuge) from these three communities was approximately 106 moose during the 1999–2000 hunting season (Coiley-Kenner et al. 2003). A winter hunt (as many as 14 days during the period December 1–January 31) was established for 2002–2003.

Until the late 1990s, moose were virtually absent in the western half of the Togiak Refuge (GMU 18), although suitable habitat occurs in all river drainages. The population began growing, primarily in the Goodnews River watershed, in the early 2000s (Table 3-4), and reached a harvestable level by 2008. The population growth is a function of immigration of moose from GMU 17A, and high reproduction and survival of moose on the western half of the Refuge.

Table 3-4. Number of moose observed during aerial counts within Game Management Unit 18

Year	Number of Moose
1992	0
1994	0
1995	2
1997	1
1999	4
2002	5
2004	12
2005	25
2006	64
2008	121
2009	146

Furbearers—Beaver, fox, wolves, coyote, river otters, mink, marten, lynx, Arctic ground squirrels, weasels, muskrats, marmots, and wolverines are all known to occur within the Refuge. Beaver cache surveys monitor trends in relative abundance and distribution of beaver food caches, but no other studies have been conducted to determine the distribution, abundance, seasonal movements, or immigration of any other furbearers on the Refuge.

Beaver cache surveys were conducted from 2002 to 2007 for several rivers, including the Kanektok, Ongivinuck, Togiak, and Weary rivers. Survey results indicate cache densities are highly variable over time, although recent results are within the range of cache density determined by ADF&G surveys results dating back to 1975 (Collins 2002).

Bear—Brown and black bears occur within the Togiak Refuge, with black bears considered rare and brown bears considered common throughout the area. Brown bears are seasonally abundant along salmon spawning areas, particularly along tributaries of the Togiak and Kulukak rivers, and encounters between bears and people are common in these areas. To date, few surveys have been completed on brown bear population in the Togiak Refuge; consequently, the density, population trends, key habitat areas, and other aspects of the population are not well understood. In 1884, brown bears were reported to be abundant in the Togiak River drainage (Petrof 1884). An aerial survey conducted by the Service and

ADF&G in 1974 reported sighting 22 brown bears and 2 black bears after more than eight hours of flight time. This survey covered all of the major drainages in what is now the Togiak Refuge. Most of the reported sightings were in the drainages around Togiak Lake and those in the vicinity of Ualik and Amanka lakes (USFWS 1974). In 2003 and 2004, Togiak Refuge conducted a population estimate of brown bears refuge wide. Estimated population density was 40.3 bears per 1,000 square kilometers. Although statistically valid surveys detailing the brown bear population over time do not exist, we believe that this population is increasing based on anecdotal observations over time from refuge staff, other agency personnel, residents of villages in the vicinity of the refuge, and hunting guides that use the refuge.

Marine Mammals

The Bering Sea is the third largest semi-enclosed sea in the world and has one of the most extensive continental shelves (Williams et al. 1998). The broad shelf, enhanced by nutrient upwelling and intermixing of Pacific Ocean and Bering Sea waters along the Aleutian Chain, provides extremely favorable habitat for a host of marine birds, marine mammals, and fish that are of international and domestic importance.

The Refuge's 600 miles of rocky coast and sand beaches support a diverse and abundant marine mammal population. The Cape Peirce and Cape Newenham areas are particularly rich in marine mammals, providing haulout areas for Pacific walrus, harbor seals, spotted seals, and the endangered Steller sea lion.

At least 17 marine mammal species are known to occur within or near the Refuge. This list includes gray, sei, minke beluga, goosebeak, and killer whales; Pacific white-sided dolphin; harbor and Dall's porpoises; Steller sea lion; Pacific walrus; and northern fur, harbor, spotted, ribbon, ringed, and bearded seals.

The objective of the Refuge's marine mammal inventory and monitoring program is to estimate the abundance, haulout use, and production of marine mammals on the Refuge and in northern Bristol Bay. The main tasks of this program are to estimate the number of Pacific walrus at Cape Peirce and Cape Newenham, estimate the number of harbor seals and spotted seals at Cape Peirce, estimate the number of sea lions at Cape Newenham, and document behavioral responses of marine mammals to aircraft, subsistence, and visitor use.

Pacific Walrus—Male, female, and young Pacific walrus that winter in and near Bristol Bay and Kuskokwim Bay migrate north in the spring. Some of the males remain behind, however, and haul out at Cape Peirce and Round Island or Cape Seniavin (Frost et al. 1982; Fay 1982). Cape Peirce was historically used as a haulout but was abandoned sometime during the first half of the twentieth century. Pacific walrus began re-using the haulout in 1981. Walrus haulout history is listed in Figure 3-9 and is discussed in the following text.

Walrus eat a variety of prey, ranging in size from small crustaceans to adult seals, but primarily benthic mollusks (Fay et al. 1990; Sheffield 1997). Prey density is thought to be an important determinant of walrus distribution.

For walrus, coastal haulouts appear to be important principally as places to rest between feeding forays (Frost et al. 1982). Because terrestrial haulouts are few, they may be of particular importance. Probably the most important consideration for terrestrial haulout sites is isolation from disturbance. Proximity to feeding areas, social behavior, learning, and other factors as yet unknown also play a part in determining those habitats the animals will actually use.

Pacific walrus counts from 1981 through 2000 show a high degree of variability. Figure 3-9 lists the peak counts for Pacific walrus at Cape Peirce from 1983 through 2006. The Pacific walrus population has remained relatively stable during this timeframe and cannot be used to explain this variability. The issue is complicated by not understanding the dynamics between the U.S. and Russian terrestrial Pacific walrus haul-outs.

Refuge staff has monitored the numbers of walrus hauling out at Cape Peirce since 1981. Counts have been variable (Figure 3-9). The variation in walrus numbers using Cape Peirce is not a function of overall Pacific walrus population size and is hypothesized to be related to local rather than population-wide conditions.

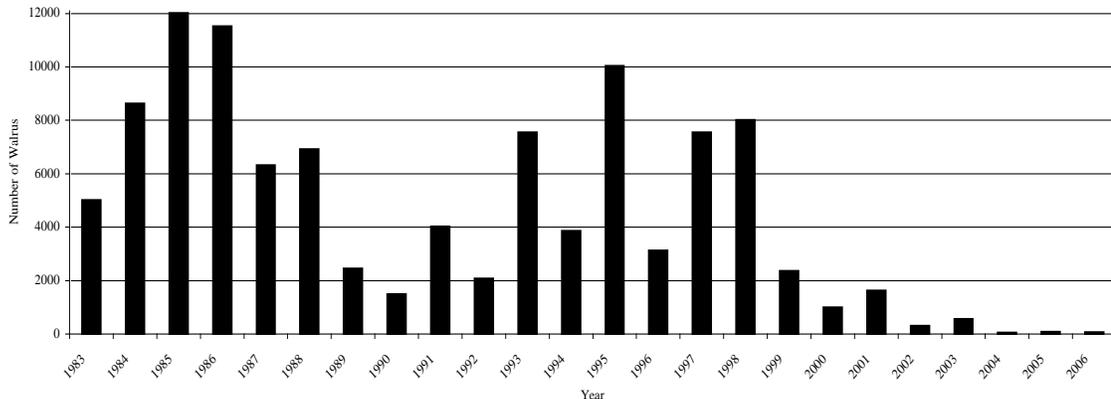


Figure 3-9. Peak Pacific walrus haulout counts at Cape Peirce, Alaska

Harbor and Spotted Seals—Harbor seals and some spotted seals haul out along the refuge coast, with the highest concentrations at Nanvak Bay (Cape Peirce) and Hagemeister Island. Nanvak Bay is the northernmost pupping area and the largest haulout for harbor seals in northern Bristol Bay (Frost et al. 1982). The number of seals hauling out in Nanvak Bay declined from the mid-1970s through 1990 (Jemison 1991). However, the numbers of seals at Nanvak Bay has remained relatively stable since 1990.

Causes for the decline in harbor seal numbers (in Alaska) have not been identified (Lewis 1995). Factors that may be affecting seal numbers include direct and indirect interactions with fisheries, subsistence harvests, disease, predation, pollutants, and disturbance.

Coastal haulouts appear to be important for harbor seals principally as a place to rest, give birth, care for and nurture their young, and molt on land (Frost et al. 1982). There are indications that hauling out may be particularly important during the molt. Ready access to water, isolation from disturbance, protection from wind and wave action, and access to food sources have all been mentioned as prerequisites for haulout selection (Burns 1984).

Steller Sea Lions—Cape Newenham and Round Island support the two largest Steller sea lion haulouts in northern Bristol Bay. ADF&G has monitored sea lion populations at Round Island since the late-1970s. The Service began monitoring sea lions at Cape Newenham in 1990 and continued through 1993. From the late 1950s to the mid-1980s, sea lion numbers declined in Alaska (Hoover 1988), and Steller sea lion abundance has declined by more than 80 percent in the past 30 years in the southeastern Bering Sea (Williams, et al. 1998). On April 10, 1990, the Steller seal lion was designated as endangered in the population west of 144 degrees west longitude, which includes the coastline of the Refuge.

In 1991, Cape Newenham was identified as a Steller sea lion haulout. Steller sea lions usually begin using the Togiak Refuge haulout in April and are seen feeding along the coast during the herring spawning migration, which usually occurs in May. Pupping at this haulout is rare. They normally feed heavily on herring in Chagvan Bay during May and June. Average annual sea lion counts have ranged from 166 to 300 at Cape Newenham.

3.5 Human Environment

3.5.1 History

The Cape Newenham and Togiak region of southwestern Alaska has been continuously occupied for 9,000 years and possibly longer. Kusququagmiut Eskimos occupied the area from Chagvan Bay north to the Kuskokwim River. The Chingigumiut Eskimos were a subgroup of the Kusququagmiut Eskimos who occupied the area around Cape Newenham. Tuyuyarmiut Eskimos lived within the areas between Cape Newenham and Nushagak Bay.

At the time of the 1880 census, approximately 2,300 Eskimos lived within what is now the Togiak Refuge. Elliot (1887) wrote that the Togiak River was remarkable for the density of population along its banks. At that time, 1,926 people lived in seven villages along the river from Togiak Lake to Togiak Bay—reflecting the abundance of fish and wildlife and size of this river system.

The Tuyuyarmiut, unlike most coastal Eskimos, did not depend entirely on marine resources. In the spring and fall, they hunted moose, caribou, and brown bear in the interior mountains and valleys. In midsummer, they returned to their villages to harvest salmon.

Kusququagmiut, who occupied the area west and north of the Tuyuyarmiut, depended more upon the sea and spent little, if any, time hunting land animals. The Chingigumiut people living in the vicinity of Cape Newenham, for example, obtained meat, blubber, and oil from seals, beluga whales, and Pacific walrus. Pacific walrus were especially prized for their ivory, which was used in tools and for trade. Seabirds provided meat and eggs, and feathers for clothing. Salmon and trout were also important items in the Kusququagmiut diet.

As forms of transportation in the Bristol Bay and Kuskokwim Bay regions began to shift from kayaks and dog sleds toward large sea-going ships owned by fishing and trading companies, the population of the region began to congregate near the coastal bays these ships used. This, along with the widespread epidemics that led to sharp population declines, caused many village sites throughout the region to be abandoned. Today, communities in and around the Togiak Refuge include Quinhagak, Goodnews Bay, Platinum, Togiak, Twin Hills, Manokotak, Aleknagik, Dillingham, and Clark's Point.

3.5.2 Cultural Resources

The Togiak Refuge includes hundreds of important cultural sites, many of which are likely to be located in areas where public use is concentrated. This concentration makes these resources particularly vulnerable to looting and damage. Illegal digging and looting are notable concerns in this area of Alaska. Although we are aware of vulnerable concentrations in these areas, we have little current knowledge of their conditions or the level of impacts caused by public use.

Portions of the Refuge have been surveyed for cultural sites fairly extensively but with little excavation. Almost 200 sites have been documented within the Refuge, and another 50 sites have been documented nearby. Most sites documented are associated with major river

drainages, lakes, and bays. It is assumed that some sites have been destroyed because of natural soil erosion along rivers and bays.

Distribution of remains on the Refuge is not uniform. Before 4000 BCE (Before Common Era), people living in what is now the Togiak Refuge were primarily inland caribou hunters. After 4000 BCE, inland hunting continued, but people in the area also began exploiting coastal resources, particularly in the Security Cove area. Dumond (1987) states the coastal area of the Refuge has been the center of human activities for the past 2,500 years, and he expects most sites to be found there and along the major rivers. Interior site distribution is spotty, and the sites there are more ephemeral.

Natural areas and landscape features may be culturally significant. These sites are important in maintaining the cultural traditions and beliefs of local people.

3.5.3 Local Population and Economy

Population

Table 3-5 shows the population changes in the nine principle Refuge-area communities since 1960 (Goldsmith et al. 1998; DCED 2005).

Table 3-5. Local population census data for communities within and adjacent to the Togiak Refuge

	1970	1980	1990	2000	2005
Aleknagik	128	154	185	221	241
Clark's Point	95	79	60	75	65
Dillingham	914	1,563	2,017	2,466	2,370
Manokotak	214	294	385	399	437
Quinhagak	340	412	501	555	642
Togiak	383	470	613	809	779
Platinum	55	55	64	41	38
Goodnews Bay	218	168	241	230	238
Twin Hills	67	70	66	69	71
Total	2,414	3,265	4,132	4,865	4,881

The populations of these communities are predominantly Alaska Native, with most non-Native Alaskans living in Dillingham. The commercial fishing industry draws a very large nonresident population to the region each year. Dillingham is most affected by this seasonal influx of workers. Local residents are also drawn from outlying communities to Dillingham during the commercial fishing season. Government spending has been an attractive force, serving to keep populations in the region higher than they might otherwise have been.

*Economy*¹

In the 1800s, Russian American Company traders established a fur trading fort on the Nushagak River, which was soon handling more than 4,000 pelts annually from brown and black bears, wolves, wolverines, beavers, martins, mink, marmots, muskrats, river otters, ground squirrels, lynx, seals, and foxes. The trade in furs waned around World War I, although some trapping continues today.

As the fur industry declined, mining and commercial fishing grew. Several placer gold mines operated near the Arolik River between 1900 and World War II. Platinum mining near Goodnews Bay began in 1926, continued until 1975, and has been intermittent since then. During the 1920s, 1930s, and into the 1940s, a number of placer mining operations were active in the Arolik, Goodnews, Eek, and Kanektok River systems, and on Trail Creek. Varying amounts of gold and platinum were recovered, with the most extensive operations within the Refuge occurring on a tributary of the Arolik River prior to establishment of the Refuge. Abandoned cabins, airstrips, tractor trails, rusting machinery, empty barrels, and tailing piles are evidence of these past operations scattered throughout the region. At present, there are approximately 20 unpatented mining claims held by two claimants on refuge lands.

For at least the past 30 years, commercial fishing and fish processing—supported by the highly productive Bristol Bay fishery—have dominated the Refuge-area economy. These activities are highly seasonal, with a very distinct peak from May through September. Government spending and tourism, built primarily around recreational fishing, are also important contributors to the local wage economy. Because most area communities are so small, the trade and service sectors are not well developed; the small villages depend on the regional center of Dillingham and on Anchorage to provide most support services and retail opportunities.

Commercial fishing and fish processing—From 1985 through 1996, the annual value of salmon harvested in the Bristol Bay-area commercial fishery fluctuated around \$200 million (in 1997 dollars). A poor salmon harvest in 1997 marked the beginning of a reduction in the value of the fishery. Table 3-6 shows annual harvest and value of the Bristol Bay salmon fishery for 1985 through 2007.

The commercial fishery is a limited entry fishery, and many permits are owned by nonresidents who come to the state for only a few weeks in the summer. Moreover, many of the permits held by Alaskans belong to fishermen who live outside the region. Employment in fish processing is also dominated by workers from outside the region and outside the state; in a given year, usually less than 20 percent of processing employees are Alaska residents. The short fishing season, combined with the large nonresident share of permit holders, crew, and processing workers, means much of the economic impact of this harvest falls elsewhere, as dollars earned in the region are spent outside the region or outside the state.

Government—Government employment at all levels accounts for about one in three jobs in this part of Alaska. Most of these are local government jobs. The Federal and state government jobs tend to be concentrated in the regional service centers of Bethel and Dillingham. Most local

¹Except where otherwise noted, this section is derived from a report commissioned by the U.S. Fish and Wildlife Service: Goldsmith, O.S., A. Hill, T. Hull, M. Markowski, and R. Unsworth. 1998. *Economic Assessment of Bristol Bay Area Refuges: Alaska Peninsula/Becharof, Izembek, Togiak*. Institute of Social and Economic Research, University of Alaska Anchorage, and Industrial Economics Incorporated. Anchorage, Alaska.

government employment is with municipal governments or school districts. All of the financial support for rural schools, and much of the financial support for local municipal governments, comes from state government because local tax bases are small in most of the region's communities. Many government positions are relatively high-paying, year-round jobs, which provide some stability to the regional economy that otherwise depends heavily on commercial fishing.

Table 3-6. Annual Value of Bristol Bay Salmon Harvest

Year	Harvest (million of fish)	Value (million)	Value in \$1997 (million)
1985	25.005	\$120.731	\$165.235
1986	17.680	\$141.063	\$189.480
1987	17.739	\$135.667	\$181.558
1988	16.662	\$176.858	\$235.811
1989	30.274	\$177.787	\$230.471
1990	35.215	\$202.259	\$246.940
1991	27.259	\$106.384	\$124.229
1992	33.560	\$193.745	\$218.832
1993	41.460	\$154.411	\$169.128
1994	36.530	\$193.550	\$207.600
1995	45.520	\$190.810	\$198.915
1996	30.740	\$140.870	\$142.943
1997	12.740	\$66.400	\$66.400
1998	10.720	\$71.230	---
1999	26.390	\$115.070	---
2000	21.120	\$81.080	---
2001	15.060	\$41.000	---
2002	11.200	\$32.393	---
2003	15.790	\$48.330	---
2004	27.286	\$76.986	---
2005	26.077	\$96.515	---
2006	31.069	\$111.715	---
2007	31.830	\$117.994	---

Source: Goldsmith et al. 1998 and Alaska Department of Fish and Game Division of Commercial Fisheries website: <http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/salmhome.php> accessed on August, 9 2005

State and Federal government grants and assistance also support a large number of jobs in social service delivery in Togiak Refuge area communities, particularly in the health care and day care fields. Federally supported rural housing authorities provide money for construction of housing.

State and Federal agencies provide construction grants through a variety of programs for economic development projects, water and sewer construction, transportation facilities, and other capital projects. These grants provide construction employment throughout the region.

Finally, Federal and state transfers to individuals are important components of household income in most of the region. These transfers include the Alaska Permanent Fund dividend, Social Security payments, unemployment insurance, and welfare benefits.

Tourism— Tourism is centered on the recreational fishery, which draws people from throughout the world to the lakes and rivers that flow into Bristol Bay. Wood Tikchik-State Park, to the east of Togiak Refuge, has a number of exclusive fishing lodges catering to catch-and-release anglers. Guests from these lodges are able to reach many sites by float plane and raft during their visits. As with the commercial fishery, the tourist season is short, so economic activity related to tourism tends to be conducted to a large degree by nonresidents. As a result, even though tourists may spend a lot of money to get to the Bristol Bay area and spend a lot more money while in the region, little of that money stays in the region. It escapes because most of the jobs in the tourism industry are taken by nonresidents and because the seasonality of demand makes it difficult for other economic activity within a community to build up around a tourist base.

Economic Significance of Togiak Refuge— Economic significance is a measure of the employment (in terms of average annual jobs) and household income generated by activities associated with the Refuge. These activities include refuge management, public recreation use (fishing, hunting, and non-consumptive activities), commercial fishing, and subsistence uses. In 1997, the total economic significance of Togiak Refuge was estimated at 560 average annual jobs and \$20.4 million (Table 3-7).

Estimating the economic significance of the Refuge is difficult in part due to attribution challenges. For example, salmon caught in Bristol Bay may rely on spawning and rearing habitat within Togiak Refuge for part of their life cycle, but there is no single, “correct” method for determining what portion of the income generated by commercial fishing in Bristol Bay is attributable to Togiak Refuge. Likewise, travel and equipment expenditures made by recreational visitors and subsistence users are not wholly attributable to Togiak Refuge, so there is no single “correct” attribution.

For the purposes of this assessment, the Institute of Social and Economic Research at the University of Alaska Anchorage (ISER) reviewed the distribution of the Bristol Bay salmon harvest by river system. Based on that review, only the portion of the harvest associated with Togiak Refuge river systems was attributed to the Refuge. The estimates of economic significance presented here assume that if a fish is hatched in a Togiak Refuge stream, the Refuge receives credit for the entire economic impact generated by the harvest and processing of that fish. Harvest data used for calculations are from 1995, a year in which the value of the harvest was better than the average value during the 1990s. Since 1997, the annual value of the harvest has been less than half what it was in 1995. Due to the highly variable nature of the commercial salmon fishing and processing industry, estimates of economic significance presented here (Table 3-7) should be viewed in context as a “snapshot” in time.

For recreational activities, economic significance is determined from visitation and expenditure data for four types of use: fishing, big game hunting, waterfowl hunting, and non-consumptive use (e.g., photography, kayaking). Visitation data used to calculate economic impacts are from mid-1990s records kept by Togiak Refuge and the Alaska

Department of Fish and Game. Expenditure data are estimated for 1997, based on spending patterns identified in several studies conducted in the late 1980s and early 1990s.

The economic significance of subsistence activities is based solely on subsistence-related expenditures for equipment and fuel made by residents of communities within and adjacent to Togiak Refuge. Annual subsistence-related spending in these communities is estimated at \$1.7 million in 1997 dollars.

The economic significance of refuge management activities is based on the three-year average annual operating budget for Togiak Refuge, which was estimated to be \$1,327,000 (in 1997 dollars). Only the costs of normal operations and maintenance are included in this figure; large capital expenditures and expenditures made at the regional and national levels are not included.

Table 3-7. Estimated economic significance of activities associated with Togiak Refuge in 1997

Activity	Income (\$1997)	Employment (annual average jobs)
Commercial Fishing	\$14,840,000	333
Recreational Activities		
Fishing	\$3,570,000	155
Big Game Hunting	\$300,000	1
Non-Consumptive Use	\$300,000	1
Refuge Management	\$1,050,000	32
Subsistence	\$880,000	38
TOTAL	\$20,940,000	560

3.5.4 Access and Transportation

Mining Activities 1900–1980—By the early 1920s, mineral prospecting had occurred throughout the Bristol Bay and Kuskokwim Bay regions. As early as 1926, drilling activities were occurring on claims along Kow Kow Creek (a tributary of the Arolik River), and shoveling operations were underway along Wattamus, Olympic, and Bear creeks (tributaries of the Goodnews River) (Holzheimer 1926).

In the summer of 1937, barges had delivered materials to construct an eight cubic foot dredge south of Goodnews Bay to work claims for the Goodnews Bay Mining Company. Freight for the company was being hauled by Caterpillar tractor from Platinum, along the coast to the mouth of the Salmon River, and then upriver to the mining camp. The Clara Creek Mining Company was operating a dragline in the area at that time, and the company was in the process of taking a drill inland from the north side of Goodnews Bay to Snow Gulch, a tributary of the Arolik River.

By November of 1937, the Goodnews Bay Mining Company had operated the dredge 40 days and was operating two draglines on Platinum Creek. At this time, a Caterpillar road led from Platinum around the northeast end of Red Mountain to the Clara Creek Mining Company camp. The road was being reconstructed into a permanent road by the Alaska Road Commission and was planned to reach the Goodnews Bay Mining Company camp at Squirrel Creek two miles further south. On a mining claim two miles up Fox creek from its junction with Slate Creek, an airplane drill was used in 1936 and a “small hydraulic outfit”

was used the next year (USGS 1937). After hauling a drill overland from Goodnews Bay the previous year, the Goodnews Bay Mining Company reported considerable drilling along Snow Gulch. The Clendon Company also used an airplane drill to test claims along Trail, Faro, Deer, and Kow Kow creeks. (USGS 1937). This 1937 USGS report contains several photos of an open crawler tractor towing a fully erected wall tent on skids across open tundra.

In 1939, mining in the region was probably at its most active stage. Operations were located at Rainey Creek (a tributary of the Eek River), Trail Creek (a tributary of the Izavieknik River), Wattamus Creek (a tributary of the Goodnews River), Butte Creek, Kow Kow Creek, Peluck Creek, Snow Gulch, and Sulutak Creek. Placer mining also occurred along headwater streams of Kagati Lake, and an abandoned crawler type tractor remains in this area.

By 1939, the improved road had been constructed from Platinum southward to Clara and Squirrel creeks, and supplies were being hauled by truck instead of Caterpillar (Roehm 1937). Past and present day Clara Creek and Goodnews Bay Mining Company activities south of Platinum are outside the Togiak Refuge boundary.

Operations in the Arolik River drainage and overland transportation of equipment to this area took place on what are now State of Alaska lands, Bureau of Land Management lands, and private lands within the Togiak Refuge boundary. However, if the 1939 planned bulldozing activity along Keno and Sulutak creeks (probably Flat Creek on USGS maps) did occur, these motorized activities would have occurred on selected lands within the Refuge and possibly Refuge lands further upstream as well. A cabin site noted on USGS maps near the confluence of Keno and Flat Creeks is located on selected lands and is within two miles of Refuge administered lands.

Resident Subsistence Activities 1940–1986. On January 1, 1960, 50 CFR 26.14 was revised to state “Travel in or use of vehicles is prohibited in wildlife refuge areas except on public highways and on roads, campgrounds and parking areas designated and posted for travel and public use by the officer in charge.” On January 20, 1969, the Secretary of the Interior issued Public Land Order 4583, withdrawing approximately 265,000 acres from the public domain to establish Cape Newenham National Wildlife Refuge. At this time, there were no public roads, highways, campgrounds, or parking areas designated within the Cape Newenham Refuge. Therefore, the use of motorized vehicles within the Cape Newenham Refuge was prohibited under 50 CFR 26.14.

Annual narratives for the Cape Newenham National Wildlife Refuge completed in 1969, 1970, and 1971 mention the use of snowmachines and airplanes within the Refuge. No other annual narratives were written for the Cape Newenham Refuge.

Sometime around 1970, three-wheeled all-terrain vehicles became available to the general public. Their use did not become widespread in Alaska until the 1980s, but Bristol Bay area villages—which were relatively wealthy compared to many interior Alaska villages—were among the first places to adopt them (Sinnott 1990).

The 1974 Final Environmental Impact Statement (EIS) for the proposed Togiak Refuge is the most comprehensive pre-1980 documentation of natural resources, economies, subsistence, and other uses within the present day Togiak Refuge. The EIS suggests that snowmachines and motorboats were integral to subsistence activities at the time: “Cash expenditures that are now necessary in order to successfully compete for subsistence resources include guns, shells, nets, snowmachines, boats and motors, gas and oil and maintenance costs” (Alaska Planning Group 1974). Other portions of the EIS mention off-

road vehicles. The “Description of the Environment” chapter describes transportation in the proposal area as follows: “Aircraft provide the primary means of transportation to the villages; other travel is by boat, dog teams, snowmachines and other off-road vehicles” (page 26). The impact discussion of the proposed action on page 81 states, “Ground transportation routes in the Togiak region are presently limited to sled trails and winter tractor haul trails... use of trails and snowmobiles is expected to continue” (Alaska Planning Group 1974). The motorized vehicles mentioned in this document include boats, airplanes, snowmachines, and tractors. It is assumed that the tractors and tractor trails mentioned were associated with the mining activities described previously. There is no mention of tractors being used for subsistence or recreational purposes.

The 1981 Togiak Refuge Annual Narrative mentions the use of three-wheelers within the Togiak Refuge boundary on coastal beaches, uplands, and during winter months. No specific locations or uses are described (USFWS 1982).

In 1981, DOWL engineers and others working under contract for the Alaska Department of Community and Regional Affairs prepared village profiles for each Bristol Bay community, including: Togiak, Twin Hills, Manokotak, Dillingham, and Aleknagik (Alaska Department of Community and Regional Affairs 1982). These reports indicate three-wheeled ATVs were widely used in most Bristol Bay communities, and were primarily used only on roads within the communities, while boats, airplanes, snowmachines, and dog teams were used for travel between communities.

Profiles for Twin Hills and Manokotak indicate that “Three-wheel all-terrain vehicles (ATVs) are the primary method of motorized transportation within the village.” It was noted that virtually every household in Aleknagik had a snowmachine, a three-wheel ATV, and/or a trail bike. While no specific uses of three-wheel ATVs were noted in Togiak, a photograph in the village profile shows two three-wheel ATVs and a Jeep in front of the Togiak Village Co-op. The authors were specific in their discussion of transportation modes and appear to have made a distinction between ATV use within the villages and ATV use outside the village. Outside Togiak Refuge at New Stuyahok, for example, it was noted: “Skiffs are used to some extent for transportation to other villages, and during the frozen winter season snow-gos and 3-wheel all-terrain-vehicles are used extensively” (Alaska Department of Community and Regional Affairs 1982).

In the summer of 1982, 60 residents of Aniak, Sleetmute, Crooked Creek, and Chuthbaluk were interviewed, in part to delineate traditional subsistence use areas. Respondents indicated harvesting subsistence resources as far south as Aniak Lake, which lies in the mountains north of what is now Togiak Refuge. They also reported using 16 to 20 foot aluminum or wood boats powered by 15 to 35 horsepower outboard motors, some of which were equipped with jet units. In winter, travel was by dog team or snowmachine. Airplanes were reported to be rarely used for harvesting locally available resources (Charnley 1982).

A detailed report prepared by Robert Wolfe and others (1984) describes the 1982–1983 subsistence activities for residents of Quinhagak, Goodnews Bay, Platinum, and Togiak. At this time, three-wheeled ATVs were common, and four-wheeled ATVs began arriving in Togiak during the spring of 1983. Quinhagak residents were using three wheelers with trailers to haul drinking water. Wolfe and others (1984) noted that stores in Quinhagak, Platinum, and Togiak sold three wheelers in 1982. Togiak Natives Ltd. acquired a Suzuki franchise prior to 1983 and had sold 15 four wheelers by the summer of 1983.

From May 3 through June 1 of 1984, Togiak Refuge staff documented waterfowl numbers and subsistence hunting at Chagvan Bay. During their stay at Chagvan Bay, the staff observed 16 hunting groups. Five groups used boats, the other 11 groups used two-, three-, and four-wheeled ATVs, including one hunter who flew from Togiak to Platinum before riding to Chagvan Bay (Pogson et. al. 1984). A map included in the 1984 report shows the use of these ATVs occurred along beaches of the north spit of Chagvan Bay (not on refuge lands).

The 1986 Comprehensive Conservation Plan and Final Environmental Impact Statement for Togiak Refuge states: “Goodnews Bay, Quinhagak, and Platinum residents all travel by skiffs or 3-wheeler to hunt geese in spring at Chagvan Bay” (USFWS 1986). Another section of the document reads: “3-wheelers are commonly used in and around all of the villages, on adjacent local roads outside of the refuge, and on coastal beaches.” The plan also states: “Access to refuge lands by traditional means will be permitted for subsistence purposes in accordance with Section 811 of ANILCA. Traditional means, as defined in Service regulations (50 CFR 36), include snowmachines and boats (excluding air boats) on Togiak Refuge.” The consistent message from this collection of early 1980s subsistence reports and from Service documents is that three- and four-wheeled ATVs were common in villages and along certain coastal areas, but they were not used for subsistence on refuge lands.

Two documents from the second half of the 1980s indicate that ATVs were occasionally used in upland areas during periods of poor snow cover. Fall and others (1986) reported that of 153 Dillingham households surveyed, 28 percent had all-terrain vehicles. Dillingham residents who were interviewed reported using ATVs to access set net sites along Snag Point, and trappers who were interviewed in 1984 reported using snowmachines, although ATVs were sometimes used during periods of poor snow cover. The local trapping area defined for Dillingham residents who were interviewed included the Nushagak Peninsula. Schichnes and Chythlook (1988) reported that in 1986, travel within the Igushik fish camp was most frequently by all-terrain vehicle, which was also essential to the commercial fishing operation. During interviews, Manokotak residents stated the most common method of transportation for trapping was snowmachine, but all-terrain vehicles were also used during periods of poor snow cover.

Contemporary Refuge Access—Access to the Refuge today is primarily by plane, boat, or snowmachine. Most visitors fly from Anchorage to Dillingham or Bethel. From there, visitors hire an air taxi to either take them directly into the Refuge by landing on one of the rivers or lakes or to one of the smaller communities. From there, visitors can use a motorboat to go upriver into the Refuge. Other visitors who stay at lodges outside the Refuge are taken by float plane to these same rivers and lakes.

Most people who live within Togiak Refuge use motorboats, snowmachines, or personal aircraft to access various parts of the Refuge, but they occasionally charter an air taxi to take them to more inaccessible locations. During winter months, local residents are able to travel over much greater areas of the Togiak Refuge by snowmachines. Hagemeister Island is rarely used by recreational visitors and infrequently visited by local residents.

Access to the Refuge is often influenced by weather. Wind, fog, water levels, and snow or ice conditions dictate where and when people are able to travel within the Refuge. Mountainous terrain confines travel to the wide U-shaped glacial valleys and coastal plains. Travel by foot is difficult due to thick alder and willow stands along rivers, and tundra and wetlands throughout the river valleys and coastal plains. There are a few well-known winter trails that can be used to travel across the entire Refuge.

There are no roads on lands administered by the Refuge. The majority of all public use during the summer months occurs by boat along the Kanektok, Goodnews, and Togiak rivers and their major tributaries. The lower reaches of the Kanektok and Togiak rivers are within the boundary of the Togiak Refuge, but the uplands along these reaches are privately owned by Alaska Native corporations and individuals, and the lands below the ordinary high water mark of navigable waters are owned by the State of Alaska. Use of these river sections is predominantly by motorboats for subsistence activities and recreational fishing. The Togiak Refuge manages the non-navigable portions of these rivers, much of which also lie within the Congressionally designated Togiak Wilderness area. Several private inholdings are located along the wilderness portion of these rivers. Use of these river sections within the wilderness area is predominantly by guided motorized groups or rafting parties in the Kanektok, Goodnews, and Togiak river drainages. The upper Togiak River is primarily accessed by motorboat for subsistence and guided recreational use because of this river's low gradient and deeper water.

3.5.5 Subsistence

Subsistence is regarded as a way of life rather than just an activity. The meanings of subsistence are based on family traditions, religion, relationships with particular places, and a preference for natural foods.

Several communities rely on the resources of the Refuge for subsistence purposes. Manokotak, Togiak, Twin Hills, Goodnews Bay, Platinum, Quinhagak, Dillingham, Aleknagik, and Clark's Point are all either within, or near to, the Refuge. The primary subsistence use areas within the Refuge are the Kanektok, Goodnews, Osviak, Matogak, Igushik, and Togiak rivers.

A wide variety of subsistence activities occur year round on or near the Refuge, and other activities last a short time, depending upon the resource. In late winter, spring, and fall, hunting for seals, Pacific walrus, beluga whale, and waterfowl is common. Fishing for herring, smelt, and char; gathering herring roe deposited on the kelp leaves; and collecting gull and murre eggs are also typical in late spring. As spring progresses and changes to summer, salmon fishing is in full swing, starting with chinook, sockeye, and chum, and then progressing to pink and coho salmon in late summer. Caribou and moose hunting, berry picking, firewood-gathering, and the gathering of other plants are primarily fall activities. As fall progresses, Dolly Varden, lake trout, Arctic char, rainbow trout, round whitefish, Arctic grayling, and northern pike are targeted; as lakes begin to freeze, jigging through the ice for these fish is common. Animals hunted include ptarmigan, ground squirrel, and brown bear. With winter comes trapping. Fox, mink, wolf, beaver, otter, wolverine, and lynx are the major species trapped. Several areas also have winter hunting seasons for moose and caribou.

Area residents use a variety of plants for food, medicines, and firewood. As an example, approximately 80 percent of households in Togiak, Twin Hills, and Manokotak are each estimated to harvest 22–31 gallons of wild berries annually. Over 50 percent of households in these three communities cut a combined total of roughly 632 cords of wood annually for smoking fish and other meat, home heating, and other household uses (Coiley-Kenner et al. 2003). Much of the wood cutting probably occurs on private lands near the communities.

Salmon, non-salmon fish species, large land mammals such as moose and caribou, and wild plants comprise 80–90 percent of all subsistence resources harvested (on a usable weight basis) by residents of many communities within and adjacent to Togiak Refuge. The remaining 10 percent is mainly comprised of small land mammals, marine mammals, various bird eggs and bird species, and marine invertebrates (Coiley-Kenner et al. 2003).

Wolfe et al. (1984) reported that traditional rights to salmon fishing areas are influenced by customary law, and that communities view certain areas as their traditional territories. Drift and seine fishing areas are viewed as common property; a first-come basis of use appears to prevail. However, set net areas and salmon fish camps tend to be recognized as “traditional use areas of particular kinship groups or clusters of kinship groups.” Several campsites along the Kanektok and Goodnews rivers are named after people, and even when not used for several years, these sites retain identification with the kinship group. Other members of the community may use these locations after requesting permission from the appropriate kinship group.

Kanektok River

Gill nets are the primary means of harvest used in Kuskokwim Bay (outside of the refuge boundary) and in the lower Kanektok River. Sweep seining and short set nets are used in the Kanektok River upstream of the Togiak Wilderness area boundary. Residents also use rod and reel gear for subsistence harvest of salmon (Wolfe 1987). Salmon harvested from summer commercial salmon fishing activities are also retained for subsistence use, as are Dolly Varden and rainbow trout. Residents of Quinhagak have identified 51 traditional use sites (fish camps, hunting camps, and other locations) along the Kanektok River (Wolfe 1987); 29 of these sites are located upstream of the Togiak Wilderness area boundary. Quinhagak residents reportedly travel to Kagati Lake more in winter than at any other time of the year. Kwethluk residents periodically visit Kagati Lake in fall for hunting and squirrel trapping and also during winter for trapping and hunting furbearers (Wolfe et al. 1984; Coffing 1991).

Goodnews River

Most subsistence fishing for char, whitefish, Arctic grayling, and rainbow trout in the Goodnews River occurs within the lower 10 to 15 miles of the river, which is outside of the Refuge boundary (Wolfe et al. 1984; Wolfe 1987). From late May through early July, chinook, chum, sockeye, and pink salmon are taken with gill nets along the shore of Goodnews Bay. Salmon are also harvested a short distance up the Goodnews River with drift, set, or seine nets. Most salmon are taken with subsistence nets in Goodnews Bay before commercial season begins (Wolfe 1987). Small quantities are taken throughout the summer from commercial nets in the ocean or the river (Wolfe 1987). Trips are made upriver in summer to gather firewood, hunt beaver and birds, and harvest freshwater fish.

In late summer, coho salmon are harvested in the river, and berries are gathered along the shores. Day trips are also made upriver to collect firewood and to harvest Arctic ground squirrel and waterfowl. Some hunters make longer trips far upriver for moose. After the river freezes, trips are made to gather firewood and to hunt small game and the occasional moose. Trapping occurs throughout the area. Jigging through the ice for char, round whitefish, Arctic grayling, and rainbow trout occurs throughout the winter until breakup (Wolfe et al. 1984). Subsistence use maps that include the community of Platinum suggest a harvest pattern similar to that of Goodnews Bay, but subsistence fishing sites have not been mapped specifically for the Platinum community.

Osviak and Matogak Rivers/Hagemeister Island

Much of the property surrounding the mouths of the Osviak and Matogak rivers is privately owned. Subsistence use is concentrated on the lower stretches of these rivers, particularly the Osviak, where several subsistence and commercial fishing cabins are located. Few data exist on the extent and intensity of use, but traditional sites are probably used primarily for fish camps during spring, summer, and fall. Of Togiak households interviewed, 23 percent reported using this area for freshwater fishing (BBNA and ADF&G 1996). Togiak residents

use this area to harvest a small number of Dolly Varden during the summer and occasionally smelt and rainbow trout (BBNA and ADF&G 1996). Other associated subsistence activities occur opportunistically.

Hagemeister Island is only used occasionally for subsistence purposes. Distance and swift tidal currents of Hagemeister Strait deter frequent access by small skiff from Togiak. Other subsistence access is by airplane or larger boats, particularly during the herring fishery.

Togiak River

The Togiak is an important river system for residents of Togiak and Twin Hills, both located near the mouth of the river on Togiak Bay. Residents of both communities use the river drainage for subsistence activities such as fishing, hunting, berry picking, trapping, and firewood gathering (Wolfe et al. 1984). The lower river section, below the Togiak Wilderness Area boundary, receives most of the subsistence net fishing for salmon (Wolfe 1987) and ice fishing in the winter for char.

Unlike other rivers in the Togiak Refuge, the entire Togiak River is accessible by motorboat as long as it is ice free. For this reason, there are a number of important subsistence sites located within the Togiak Wilderness (Wolfe 1987). The tributaries of the Togiak River are valued as important reserves for fish and fish habitat.

Wolfe (1989b) states that subsistence salmon and char fishing occurs primarily in the Togiak River, with some fishing also occurring in marine waters of the bay. Research conducted in 1987 documented subsistence net fishing at 95 sites along Togiak River and Togiak Lake. The greatest concentration of sites was along the lower 12 miles of the river (well below the Togiak Wilderness boundary) and averaged 4.6 sites per river mile. Early in the salmon season, day trips are made by elders accompanied by younger children to harvest chinook, sockeye, pink, and chum salmon. Adult males harvest coho and char from mid-August through mid-October.

Residents of Togiak and Twin Hills utilize the upper Togiak River for subsistence purposes. The 1987 study by the ADF&G Subsistence Division (Wolfe 1989a) documented 24 subsistence salmon net fishing sites in the 41 miles of the upper river in the Togiak Wilderness. Nine sites were documented along the shores of Togiak Lake. Refuge staff have identified 18 “fishing holes” on the upper Togiak River that correspond very closely with the 24 subsistence net sites. Some subsistence set net sites are within a very short distance of each other, thus potential still exists for some level of displacement.

Based on a 1996 report by Bristol Bay Native Association (BBNA) and ADF&G, more than 26 percent of Togiak households reported harvesting freshwater fish from the Pungokepuk Creek (a tributary of the Togiak River) area from 1985 through 1994. Harvests included northern pike, Dolly Varden, Arctic grayling, whitefish, and rainbow trout (BBNA and ADF&G 1996). More than 50 percent of Togiak households responding also reported fishing Togiak Lake and the upper Togiak and Ongivinuck areas during the same 10-year period. Subsistence harvests of salmon (other than spawned-out sockeye salmon harvested at Togiak Lake) are fewer in the upper river than in the lower part of the Togiak River, where fresher fish can be found. Some backwaters are seined for sockeye, chum, and coho salmon. Most of the Togiak River is fished with seines, drift nets, or set nets for chinook, sockeye, chum, and coho salmon. During late August and September, many parties from Togiak and Twin Hills travel to Togiak Lake to harvest freshwater fish and spawned-out sockeye salmon and to hunt furbearers, caribou, and brown bear (Wolfe et al. 1984).

3.5.6 Recreation

Overview

The Togiak Refuge provides opportunities for wildlife-dependent recreational activities including: hunting and fishing, wildlife observation and photography, and education and interpretation. Refuge visitors can observe, photograph, and learn about a variety of animals, including walrus, seals, seabirds, and caribou; and they can hunt for various waterfowl and upland birds, and big game. Fishing, however, attracts the vast majority of visitors.

The river systems within Togiak Refuge and nearby Wood-Tikchik State Park attract anglers from around the world. The Kanektok, Goodnews, and Togiak River systems are the most popular fishing areas on the Refuge. The headwaters and upper stretches of these rivers are located within the remote Togiak Wilderness. Many visitors to Togiak Refuge are interested in multiple experiences from their trips in addition to good fishing (Whittaker 1996). Many of these experiences are associated with wilderness traits such as being in a natural place, viewing scenery and wildlife, and opportunities for solitude while boating, fishing, and camping (Whittaker 1996). Fishing trips on the Refuge typically involve several nights of tent camping, although fly-in, day-use opportunities are available as well. Commercial support services, including guiding, outfitting, and air taxis are well-established on the Refuge. The majority of recreational visitors rely on air taxis for access, and about half rely on guides.

Recreational fishing use on the Refuge increased substantially during the 1980s, and along with that increase came concerns about litter, levels of motorboat use, loss of wilderness values, and other issues. The Togiak Refuge Public Use Management Plan (PUMP), completed in 1991, was developed to address these issues. The PUMP restricts the number of permits available for guided fishing operations and calls for regulating the timing of guided trip starts, party sizes, and camping in the most popular fishing areas. The PUMP does not restrict the amount of unguided use, but it does indicate that long-term management should be directed toward a 50/50 allocation of guided and unguided use. In most areas of the Refuge, unguided fishing has increased as a proportion of all fishing so that, in a typical year, it accounts for at least 50 percent of total use days.

Although it only accounts for a fraction of the use days that fishing does, big game hunting is an increasingly popular activity on the Refuge since the State of Alaska made additional brown bear and caribou hunts available in 2002. Caribou hunting in the vicinity of Kagati Lake, which is also the launch point for popular Kanektok River float and fishing trips, increased substantially between 2002 and 2005. It has now declined, however, due to a shift in the number and location of caribou. It is likely that hunting use in this area will continue to cycle up and down in accordance with changes in caribou availability, but will not likely reach the 1995 to 2005 level for some time.

Big game hunting guide permits are allocated among exclusive guide use areas on the Refuge. These five year permits with a five year addition after review, are awarded through a prospectus system that is managed at the regional (statewide) level.

Another refuge activity that has increased in popularity is wildlife observation at Cape Peirce. Demand for this opportunity increased sharply beginning in 2000, mirroring an increase in the number of walrus hauled out at the site and the increased demand for wildlife viewing across Alaska and the nation. Since about 2005, visitation has dropped considerably as a result of much smaller numbers of walrus hauling out at the site and the reduction or discontinuance of commercial ecotourism operations by two companies that contributed to the bulk of the visitation.

Guided use, which is limited by permit availability and permit stipulations, has fluctuated around the same level for most of that time. In contrast, unguided use, almost all related to fishing, has increased well over 100 percent from 1,170 use days in 1990 to 4,507 use days in 2007. Figure 3-10 shows annual guided and unguided fishing use days from 1990 through 2007.

The Service has evidence that the Togiak refuge is a desired destination among residents of Alaska. The Alaska Residents Statistics Program published a conservative estimate indicating that greater than 3,000 residents, age 18 and older, visited Togiak refuge the year prior to the October 2006 – March 2007 survey period, and these residents came to the refuge from the interior, southwest, south central, and southeast regions of the state (Fix 2009). Although uncertainties exist, the Service anticipates future growth in visitation at Togiak refuge during the life of this plan as the state and regional populations grow, both naturally and from migration to Alaska. There is also evidence in past trends that further migration to Alaska may occur in response to the economic downturn in the lower 48 states (Fried 2009).

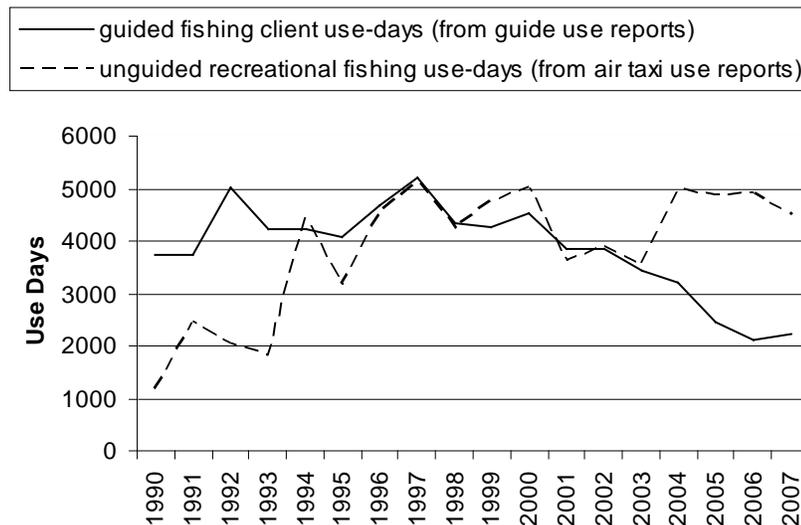


Figure 3-10 Togiak Refuge recreational fishing 1990–2007

Kanektok River

The Kanektok River has become known around the world as a premier recreational salmon and trout fishing destination. Few articles or books written about Alaska fly fishing fail to mention this remote 90-mile wilderness river. Like most other major rivers in southwestern Alaska, opportunities to fish Pacific salmon species and several resident fish species, spectacular scenery, and a variety of wildlife combine to make this river a popular attraction for recreational anglers. Fishing use on the Kanektok has been variable from year to year, but the river is consistently the most popular destination on Togiak Refuge.

Guided Recreation--Within the Togiak Wilderness, guided float operators are permitted to start at Kagati Lake every other day during the summer months. Specific float start dates for

each permit are awarded through a competitive prospectus bid system. The annual average is about 20 guided float starts for the peak season, June through August. Annual guided float use has averaged close to 800 client use days from 1990 through 2007.

Guided motorized operations are also allowed within the Togiak Wilderness through a competitive prospectus bid system. All permits for the wilderness portion of the Kanektok River drainage limit the number of clients and the number of boats allowed at one time. These limits are likely a factor in the relatively consistent amount of guided use recorded within the Togiak Wilderness from 1990 to 1998 (Figure 3-11). There was a peak in guided use in 1999–2000; then, guided use stabilized in 2001–2004, and since 2004, guided motorized use has decreased (Figure 3-11).

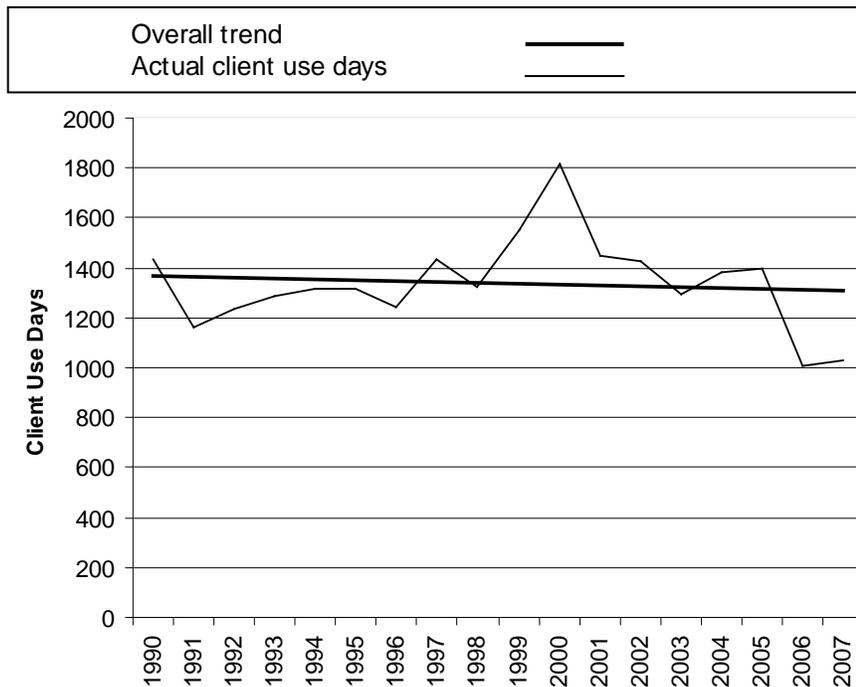


Figure 3-11. Upper Kanektok River Guided Fishing (Within Togiak Wilderness), 1990–2007

Guided motorized use within the Togiak Wilderness area has averaged 542 client use days since 1990. During peak use periods, there are typically three guided float groups on the river, using as many as 12 rafts, and five or six guided motorboat groups.

Recreational fishing opportunities along the lower Kanektok River (below the Togiak Wilderness boundary) are in high demand. Permits for guide camps along this portion of the Kanektok are not managed by the Refuge; rather, they are obtained through private land holders or through Qanirtuuq Incorporated, which is the Native village corporation in the village of Quinhagak. Observations by Togiak Refuge River Rangers and anecdotal reports from visitors indicate that use on the lower river may have increased over time, but multiple access points and limited jurisdiction make it difficult to obtain accurate assessments of the level of use by refuge visitors.

Unguided Recreation--Unguided fishing on the Kanektok River, which is not constrained by any permit requirements, has noticeably fluctuated over the last 18 years, from an average of 1,310 use days during 1990-1994 to an average of 1,900 use days during 1995-1999 to an average of 1,760 use days during 2000-2007. Figure 3-12 shows an overall increasing trend for unguided use on the Kanektok River. On average, 40 unguided trips begin from Kagati Lake each summer. In recent years, although some tapering off has occurred, an additional 6–10 unguided fall hunting trips have also begun from Kagati Lake. Unguided fishing now accounts for about 51 percent of recreational use along the wilderness section of the Kanektok River. Ranger reports show that during peak fishing periods (during the chinook and coho salmon runs), there are typically 10–14 unguided recreational fishing groups along this 58-mile stretch of river at one time.

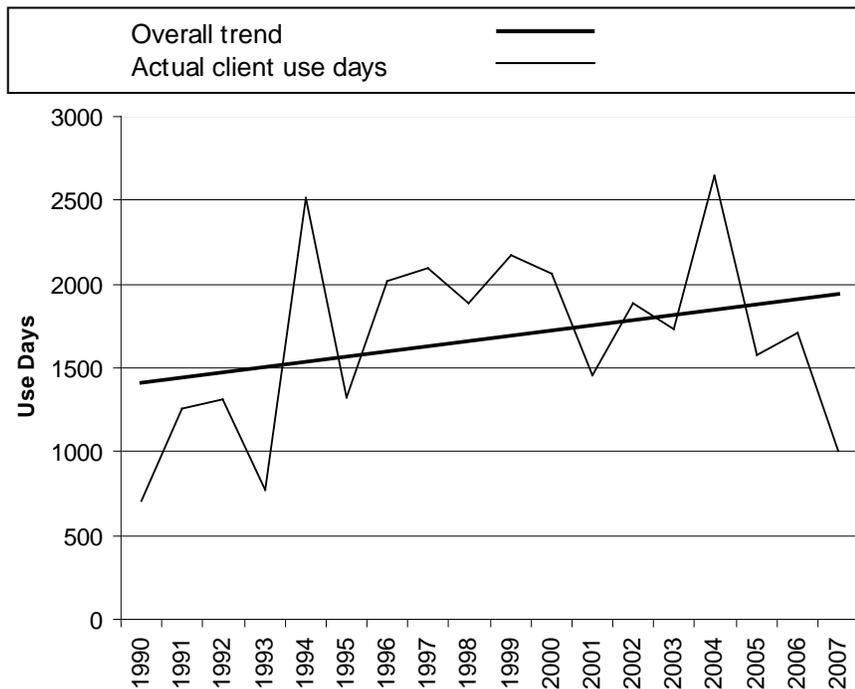


Figure 3-12. Upper and Lower Kanektok River unguided fishing, 1990–2007

Goodnews River

Most recreational fishing on the Goodnews River occurs on two major tributaries referred to as the North Fork and the Middle Fork. The North Fork receives the majority of use (guided and unguided combined). Most anglers seek opportunities to catch rainbow trout, coho salmon, and Arctic char in this river. Unlike the lower sections of the Togiak and Kanektok rivers, the lower Goodnews River is not within the Togiak Refuge boundary. Recreational fishing pressure along the lower Goodnews River steadily increased until the late 1990s and

² These numbers, gathered from air taxi reports, represent use on both the upper (Wilderness) and lower (non-wilderness) portions of the river, so they may not be directly compared to the guided use figures, which represent upper (Wilderness) use days only.

has been variable since then. The Alaska Department of Natural Resources has primary management authority on the lower river, and its navigable channels below ordinary high water line. The Kuitsarak Native Corporation owns and manages the adjacent uplands.

Guided Recreational Fishing--Commercial guides operate both float and motorboat trips on the Goodnews River. The number of permits available for commercially guided recreational sport fishing on the Goodnews River within the refuge boundary has been limited since 1984. Visitor participation in guided fishing on the upper Goodnews River increased substantially through the 1990s, growing from about 200 client use days in 1990 to a high of over 500 use days in 2001. Overall use levels have not yet approached the maximum of 1,635 guided client use days allowed under current management. Use days have declined slightly in recent years; there were 333 guided client use days recorded in 2007. However, Figure 3-13 shows an overall increasing trend for guided use on the wilderness portion of the Goodnews River during the last 18 years³.

Since 1990, motorized guided use of the Middle Fork Goodnews River and its associated summer guide camp has remained close to the maximum permitted level of 280 use days (spread over an average of 70 trips) per year. No guided float fishing is currently permitted on the Middle Fork.

Guided motorized use on the North Fork has averaged about 87 use-days (42 trips per year) since the mid-1990s. Guided float use has averaged just six trips per year during the same period, but these trips account for an average of about 72 use days per year. One guided float start is authorized per week, and these trips typically occur late in the summer during the coho salmon run.

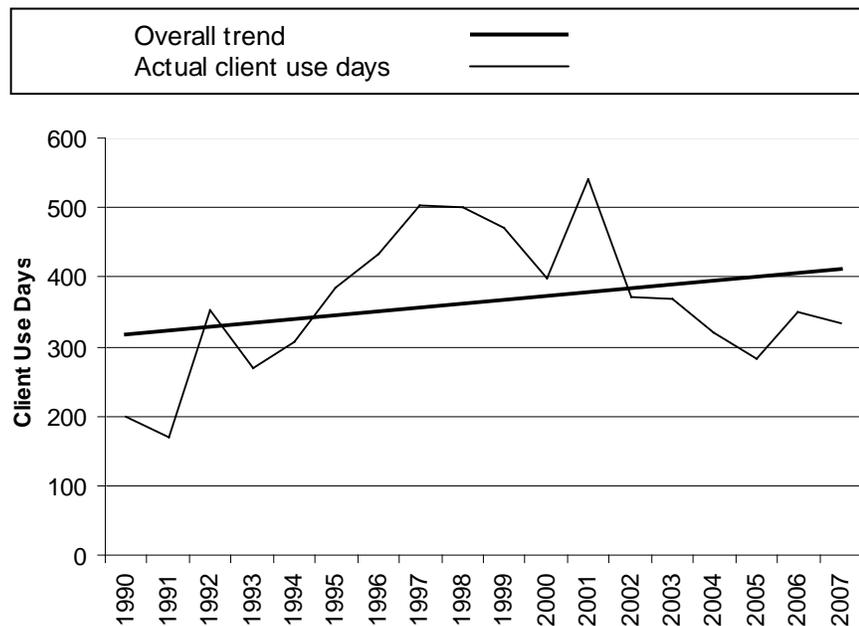


Figure 3-13. Upper Goodnews River guided fishing (within the Togiak Wilderness) 1990–2007

³ Data for 2005–2007 include the non-Wilderness area of the Middle Fork Goodnews River.

Unguided Recreational Fishing--There are no refuge restrictions on the amount of unguided fishing on the Goodnews River. Unguided use originates at Goodnews Lake, Middle Fork Goodnews Lake, or Kukaktlim Lake. Access is by float plane, and most groups are required to pull rafts through the shallow upper reaches of the rivers to reach water deep enough to float. Unguided use of the upper Goodnews River grew steadily through the early 1990s, reaching a peak of more than 2,600 use days in 1997. Since that time, unguided fishing has accounted for an average of 1,640 use days per year. Figure 3-14 shows an overall increasing trend for unguided use on the Goodnews River during the last 18 years.

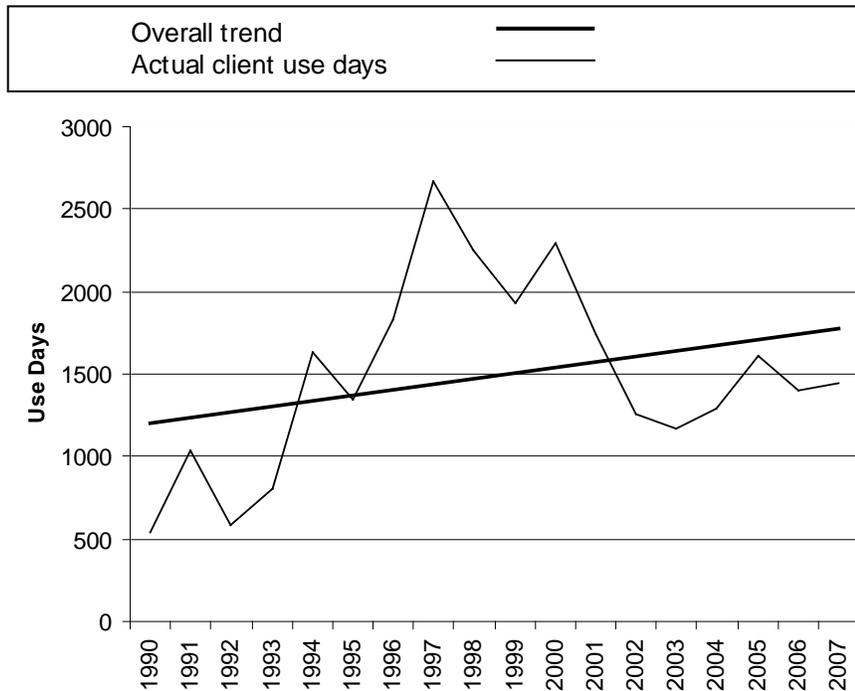


Figure 3-14. Unguided fishing on the Goodnews River (all forks, upper and lower sections) 1990–2007

Togiak River

There are numerous tributaries in the Togiak River drainage with headwater lakes accessible by float plane. These tributaries are generally shallow, small, and narrow, with many sweepers and other obstacles to navigation. The Togiak River itself originates from the largest lake in the Togiak Wilderness area. While the river is not difficult to navigate, and there are no difficult rapids, access through Togiak Bay can be hazardous because of braided tidal channels and often windy conditions. Most recreational fishing occurs from June through September. Opportunities to catch chinook, coho, sockeye, chum, and pink salmon are available. Fishing for coho and chinook salmon is the main attraction for anglers, with rainbow trout, Dolly Varden and sockeye targeted as well.

Due to the limited number of good fishing sites along the river and concerns about conflicts between subsistence use and public recreational fishing, the 1991 Togiak Refuge PUMP designated three management zones for the upper Togiak River (within the Togiak Wilderness area). Within each zone, guided fishing is limited, but there are no limits on unguided fishing.

Guided motorboat fishing accounts for most use on both the upper and lower portions of the Togiak River. Overall, the upper river receives less recreational fishing use than the lower river.

Guided Recreational Fishing--There are six commercial recreational fishing permits granted for the upper (wilderness) portion of the Togiak River. Three permits are for motorboats, allowing clients to be flown in by plane, and each are limited to one of the three zones; two permits are for non-motorized (float) boats and are not restricted to the zones; and one motorboat permit that accesses the river from below the refuge boundary does not allow clients to fly in and is not restricted to the zones. Since 1990, annual guided use along the upper river has averaged 428 client use days (Figure 3-15). Most of this use is concentrated in late summer during the coho salmon migration.

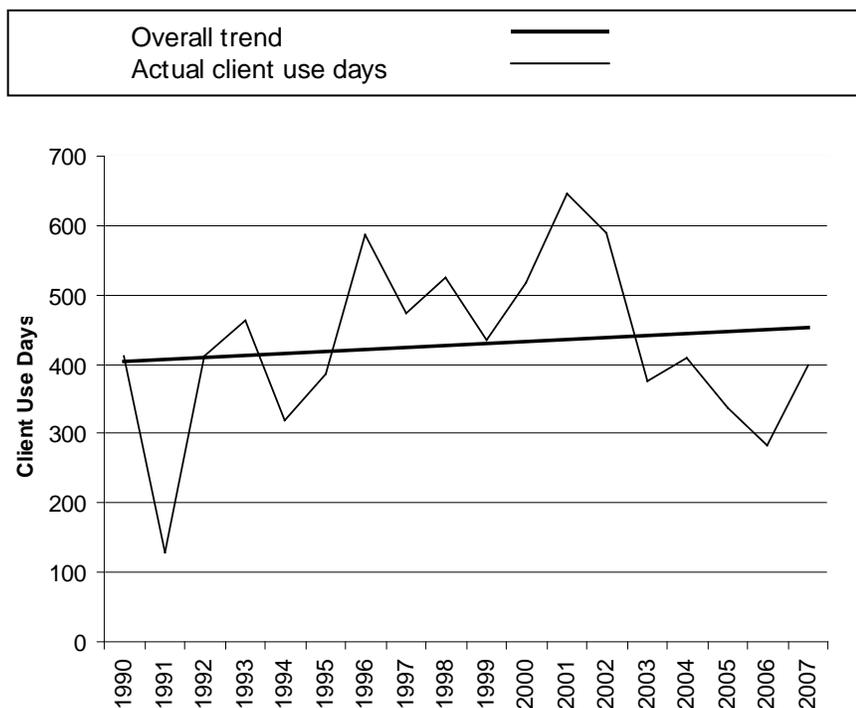


Figure 3-15. Guided fishing on the Upper Togiak River (within the Togiak Wilderness) 1990–2007

Unguided Recreational Fishing

Float groups typically access the Togiak drainage through Togiak Lake or Ongivinuk Lake. Floaters do not use the same waters until these two tributaries eventually meet, and from that point, many people continue down river to popular pick-up locations near the Kemuk River confluence or at the Togiak Wilderness Area boundary. Available data indicate unguided use of the Togiak River has ranged from 50 to 176 use days since 1993, while unguided use of the Ongivinuck River ranged from 15 to 285 use days during the same time period. Because the Ongivinuck is a tributary of the Togiak River, its recreational use is added to that reported for the Togiak River to accurately represent unguided visitation below the confluence of the Ongivinuck and Togiak rivers. Overall, during the period from 1990–2007, there has been an annual average of nine unguided groups representing about 200 use days. Use levels have fluctuated from year to year with an average of 123 use days during 1990–1994, increasing to 246 average use days during 1995–1999, and slightly decreasing to 217

average use days during 2000–2007. Overall, unguided use on the Togiak River has slowly increased during the last 18 years.

Osviak and Matogak Rivers/Hagemeister Island--The Osviak and Matogak rivers flow south from headwater areas, emptying into Bristol Bay. The Osviak and Matogak rivers are floatable for most of their lengths, but a lack of aircraft landing areas within or adjacent to the rivers makes access difficult. Float-equipped aircraft may land in Osviak Bay which is shallow and has extreme tidal fluctuations, or in the ocean off the mouth of the Matogak river. Otherwise, access is limited to small, wheeled planes landing on tundra ridges, river gravel bars, or ocean beaches at low tide. Access is also possible by boat from the village of Togiak, which takes several hours. Several privately held Native allotments are located along the lower reaches of these rivers and along the coast, making public access more difficult because permission from land owners is required for use of uplands.

Because of the access difficulties, recreational use of these rivers is negligible. Recreational use is estimated at 10 visitor days (or less) per year. This area is managed primarily for subsistence uses and is uniquely valuable because it receives so little recreational use.

A few miles across Hagemeister Strait from the mouths of the Osviak and Matogak rivers lies Hagemeister Island. Recreational use of the island is sporadic, and people occasionally visit the island by boat or plane for beach combing.

Kulukak River--The Kulukak River is a remote river within the Refuge but mostly outside the Togiak Wilderness. Temporary tent camps are permitted for guided motorized recreational fishing through a competitive prospectus bid system. Commercial guide permits limit length of stay, the number of clients, and number of boats to ensure an uncrowded, remote fishing experience compatible with conserving the area's fishery resources. Largely because of limited access, use has remained relatively low, with only occasional visits by unguided recreational anglers.

Wilderness Lakes

Five permits are currently issued for fly-in recreational fishing at a number of lakes throughout the Togiak Wilderness. To maintain subsistence opportunities, high-quality recreational opportunities, wilderness values, and healthy wild fishery stocks, several stipulations are included as part of these Wilderness Lakes guided recreational fishing permits.

Many of these lakes are not used on a regular basis by guides, with visits only three or four times per year. Use of Kagati, Goodnews, Togiak, and Ongivinuk lakes is discussed in the Kanektok, Goodnews, and Togiak river sections of this chapter. Unguided use is also very sporadic.

Cape Peirce and Cape Newenham

This area encompasses the former Cape Newenham National Wildlife Refuge, which was established prior to ANILCA. The area was included as part of the Togiak Refuge under ANILCA and includes the majority of lands currently proposed for addition to the National Wilderness Preservation System, as described in the 1985 Togiak Refuge Plan. Cape Peirce has historically served as a walrus haulout and also provides opportunities for viewing a variety of other wildlife. Cape Newenham is a spectacular basalt promontory on a coastline comprised of 1000-foot volcanic cliffs.

Because many of the marine mammals, seabirds, and other wildlife found in this unique area are very sensitive to human disturbance, public use is managed to minimize that disturbance

and to maintain the area’s primitive natural character. The southeastern portion of this area has been identified as a “wildlife viewing area.” The 1991 PUMP recommends that visitation within the viewing area be limited to no more than six people at one time through a first-come, first-served permit system in place from May 1 to November 30. At those times when either Pacific walrus are hauled out at Maggy Beach or seals are hauled out on sandbars in Nanvak Bay, boat and aircraft landings are limited. Instead, aircraft would be permitted to land just outside the wildlife viewing area at Sangor Lake or at the far northern end of Nanvak Bay. There are also a number of conditions as part of special use permits that minimize other potential wildlife viewing disturbances. Regulations to enforce the permit program have not been promulgated, although an informal permit program was in place for several years. At the current time, no permits are required to enter the wildlife viewing area.

Table 3-8. Visitor use at Cape Peirce

Year	Number of Flights	Number of Guides	Number of Clients	Total Use Days (Guides & Clients)
1991	3	0	11	49
1992	0	0	0	0
1993	1	0	3	15
1994	0	0	0	0
1995	1	0	4	4
1996	0	0	0	0
1997	3	0	6	12
1998	3	0	10	10
1999	1	0	5	5
2000	6	9	17	26
2001	15	24	60	108
2002	15	24	57	91
2003	19	30	60	90
2004	12	18	38	68
2005	5	7	20	27
2006	1	0	2	2
2007	2	1	6	36

Frequent inclement weather and long distances can make flying to and from Cape Peirce more difficult than other locations within the Togiak Refuge. This situation can affect levels of public use.

During the period from 2001 to 2004 there was a substantial increase in visitor use days relative to the prior period (1991–2000). In 2005 and following years, visitor use has decreased primarily because walrus have not been using Cape Peirce in large numbers during the summer visitation season. When walrus return to the area, visitation is likely to increase (Table 3-8).

3.5.7 Social Conditions and Visitor Experience in Popular Fishing Areas

Impacts on social conditions within the Refuge may not directly threaten wildlife or habitats, but they remain a concern because they do threaten the nature and quality of visitor and resident subsistence experiences. Within the Togiak Wilderness, experiential dimensions, including solitude or a “primitive and unconfined type of recreation,” are protected by law; and throughout the entire Refuge, managers are compelled—at a minimum—to consider the safety of visitors and minimize conflict between user groups participating in appropriate activities.

The purpose of this section is to describe important characteristics of recreational visitors and the social conditions they encounter on the Refuge, as revealed by two principle studies. The first of these studies—a recreational angler survey conducted in 1995—was developed and conducted by a contractor with input and support from Togiak Refuge and the Alaska Department of Fish and Game (Whittaker 1996). The second study, conducted in 2001, was a replication of the 1995 effort, conducted to measure changes over time. Relevant results from these studies are summarized here and discussed in more detail in Appendix E.

Visitor Motivations and Expectations

As noted previously, the majority of Togiak Refuge recreational visitors participate in fishing on one of three main river systems: the Kanektok River, the Goodnews River, or the Togiak River. The majority (90 percent) of anglers come from outside Alaska; they plan their trips months or even years in advance, and they place a high degree of importance on fishing in a natural, wilderness setting where they can view scenery and wildlife, and experience solitude. Most anglers surveyed in 1995 and 2001 indicated that they expected to find “primitive recreation” within the Togiak Wilderness, defined as a setting “where one can expect to find solitude and very few traces of previous use.” On average, surveyed anglers expected a more primitive setting than what they actually encountered on the Refuge (Appendix E).

A research study commissioned by the Alaska Department of Fish and Game examined preferences and management attitudes of Alaskan nonresident anglers (Romberg 1999). Based on a small sample of nonresident anglers (n=41), Romberg (1999) showed evidence that some specialized anglers at Togiak Refuge consider aesthetic conditions, including scenery and solitude, to be important factors when choosing a fishing location, and they tend to support limits on the number of anglers who can participate in some fisheries in order to maintain quality fishing opportunities. Consistent with this general characterization, 44 percent of unguided anglers surveyed in 2001 indicated that they would support, or strongly support, limiting the number of unguided float trips allowed within the Togiak Refuge; levels of support for limits varied between different subgroups of anglers (Appendix E).

User Tolerances and Conditions of Concern

Within the broadly uniform Togiak Refuge angler population, it is possible to identify three distinct subgroups based on fishing style and closer analysis of specific motivations and expectations. *Guided float anglers* tend to place the highest importance on solitude and natural setting conditions and tend to be the least tolerant of impacts to those conditions. *Guided motorized anglers* tend to place the least importance on setting conditions and tend to be the most tolerant of impacts. *Unguided (float) anglers* usually fall between these two groups.

Among the various factors that could impact visitor experience, Togiak Refuge anglers identified litter, human waste, and competition for fishing sites and campsites as the things that would have the greatest negative influence on their trips. Togiak Refuge anglers have especially low tolerances for litter and human waste. Despite improvements over time, these

items continue to negatively impact their experiences. In 2001, about 55 percent of surveyed anglers indicated that they saw as much or more litter and human waste as they could tolerate before their experiences were diminished. While anglers on the Refuge's three main river systems frequently travel, fish, and camp near one another, outright competition for fishing and camping sites affects a somewhat smaller proportion of refuge anglers. About 40 percent of them indicated that the number of fishing sites they had to pass up was at or above their tolerance level, and about 25 percent responded similarly with respect to passing up campsites.

In addition to litter, human waste, and competition impacts, survey responses suggest that intergroup encounters on the lower stretches of the Goodnews and Kanektok rivers may warrant concern. While boat traffic in these areas is not directly managed by Togiak Refuge, visitors who begin their trips within the Togiak Wilderness do contribute to crowding on the lower rivers. About one-third of Goodnews anglers surveyed in 2001 indicated that their experiences were diminished by the number of motorboat groups they encountered on the lower river, and 24 percent indicated that they saw too many float groups as well. Similarly, 41 percent of Kanektok anglers indicated that they encountered too many motorized groups on the lower river, and 28 percent reported seeing too many float groups.

3.6 Special Area Designations and Resource Value

3.6.1 Wilderness Values

Section 304(g) of ANILCA requires the Service to identify and describe the special values of the Refuge, including wilderness values. The term "values" is often viewed synonymously with a range of similar terms, from subjective beliefs and preferences (e.g., family values) to more objective functions, services, and benefits (e.g., ecological values). Of interest here are the objective kinds of values, specifically those that are related to the condition and character of the natural environment.

The 1964 Wilderness Act (Act) recognized wilderness as a resource in and of itself and also established a mechanism for preserving that resource in a national system of lands. The definition of wilderness found in the Act provides a framework for identifying and describing wilderness values. According to the Act, the fundamental qualities of wilderness are: *undeveloped, untrammeled, natural, and outstanding opportunities for solitude, or a primitive and unconfined type of recreation*. In addition, The Act states that wilderness "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Undeveloped—This is the most immediately observable and easily measured wilderness quality. Undeveloped simply means free from roads, structures, and other evidence of modern human presence or occupation. The undeveloped quality strongly influences other core wilderness values, in particular experiential opportunities for solitude and primitive recreation. A lone structure may have only minimal impacts on natural processes while still serving as a constant reminder of human influence for recreational visitors. Certain kinds of structures or improvements may be considered desirable in a given wilderness setting (e.g., trails) or acceptable according to specific legislation, but that does not diminish their negative impact on the undeveloped quality.

Untrammeled—The Wilderness Act states that wilderness is "an area where the earth and its community of life are untrammeled by man." In other words, wilderness is essentially uncontrolled or unrestricted by purposeful human actions. Synonyms for untrammeled include unhindered, unencumbered, free-willed, and wild (Landres et al. 2005). The untrammeled quality

of the wilderness resource is diminished when ecological events or processes are constrained or redirected to suit modern human ends (e.g., by suppressing naturally ignited fires or introducing nonnative plants or animals).

Natural—Naturalness is a measure of the overall composition, structure, and function of native species and ecological processes in an area. In contrast to the quality of being untrammled, the natural condition of an area may sometimes be enhanced through purposeful human action (e.g., to restore an eroded stream bank or eradicate an invasive weed).

Outstanding Opportunities for Solitude—Solitude in the wilderness context is generally understood to mean freedom from sights, sounds, and other evidence of modern man (Landres et al. 2005). While the relative amount of freedom from these things necessary to *experience* solitude is highly personal and variable, the Wilderness Act states only that outstanding *opportunities* for solitude be provided. Accordingly, encountering other people, hearing mechanized sounds (from aircraft overflights, for example), or seeing the lights of a distant population center are all examples of things that may negatively impact solitude opportunities; while remoteness, low visitor density, and vegetative or topographic screening are things that may enhance solitude opportunities.

Outstanding Opportunities for a Primitive and Unconfined Type of Recreation—Primitive and unconfined recreation occurs in an undeveloped setting and is relatively free from social or managerial controls. Primitive recreation in wilderness has largely been interpreted as travel by nonmotorized and non-mechanical means. Primitive recreation is also characterized by experiential dimensions such as challenge, risk, and self-reliance. Dispersed use patterns, which frequently occur where there are no facilities to concentrate use, enhance opportunities for self-reliance and also enhance opportunities for solitude. Conversely, some actions aimed at maintaining opportunities for solitude, such as restricting visitor access or behaviors, may negatively affect opportunities for unconfined experiences.

Other Special Features—Lands that exhibit the core wilderness values described previously may also contain additional special features with scientific, educational, scenic, or historic value. While the Wilderness Act makes it clear that these features are not wilderness qualities in and of themselves, their presence may distinguish one area with wilderness values from another. In the context of Alaska refuges, special features might include such things as active volcanoes, unique abundance or concentrations of a given species, fossil deposits, or evidence of prehistoric cultures.

As directed by Sections 304(g) and 1317 of ANILCA, all Refuge lands were reviewed during the first refuge planning process in the early 1980s “as to their suitability or nonsuitability for preservation as wilderness.” Several recommendations for designating refuge lands as wilderness were evaluated in the Final Comprehensive Conservation Plan and Environmental Impact Statement. The Record of Decision for the final plan included a recommendation that an additional 334,000 acres of the Togiak Refuge be designated as part of the National Wilderness Preservation System.

Refuge lands are either currently designated as wilderness or fall within the boundaries of the wilderness review units identified during the 1980s review. Those same boundaries are used here to facilitate description of the wilderness values found within Togiak Refuge (See Figure 3-16). In general, all eight areas are largely undeveloped, untrammled, and natural; and they provide abundant opportunities for solitude and primitive recreation. Therefore, only distinguishing or extraordinary features are described.

Togiak Wilderness Area

The 2.37 million acre Togiak Wilderness is the second largest designated wilderness area in the National Wildlife Refuge System. It consists of all Refuge lands in the Kanektok, Kwethluk, Eek, and Togiak river watersheds; nearly all refuge lands within the Goodnews River watershed; and the headwaters of the Arolik River. By law, this area exhibits all of the core wilderness values. In addition, it has special value due to its long, unbroken history of indigenous human use. Evidence suggests people have hunted, trapped, fished, and participated in other subsistence activities within what is now the Togiak Wilderness for 9,000 thousand or more years (Dumond 1987). The long and continuing relationship between local people and the land was one of the primary reasons for the creation of the Togiak Wilderness (U.S. Congress 1978).

Oyak Creek-Arolik River Area

This area encompasses 151,468 acres in the northwestern corner of the Refuge and consists of three separate tracts. Two tracts are on either side of the Arolik River and are separated by Native conveyed private lands. The third tract lies north of the Kanektok River.

Undeveloped and Natural—These tracts are undeveloped and provide important habitat for various fish, waterfowl, furbearers, and large mammals such as bear, moose, and caribou.

Opportunities for Solitude or a Primitive and Unconfined Type of Recreation—During the summer, access to lands within these units is difficult due to the lack of aircraft landing sites and the distance of Jacksmith Bay from Quinhagak. Winter access is somewhat easier by snowmachine. The difficulty of access to these lands provides exceptional opportunities for solitude for visitors who do manage to get there.

South Fork of the Goodnews River Watershed

Along with the currently designated wilderness portion of the Goodnews River, the South Fork's 92,000-acre area is one of the three primary Goodnews Basin watersheds within the Refuge. This area includes most of the South Fork drainage and a small portion of the Middle Fork drainage.

Undeveloped and Natural and Opportunities for Solitude—This watershed supports Pacific salmon, Arctic char, Arctic grayling, Dolly Varden, rainbow trout, and lake trout. It also provides important habitat for raptors such as the goshawk, rough-legged hawk, bald eagle, gyrfalcon, and peregrine falcon. Brown bear, beaver, caribou, and moose also are found in this drainage. There is a limited amount of motorized use and a small seasonally occupied summer camp under permit by a commercial guide on the Middle Fork.

Opportunities for a Primitive and Unconfined Type of Recreation—Upper portions of the Middle Fork Goodnews River provide one of the best combinations of accessibility and opportunities for wilderness angling within the Togiak Refuge. One commercial operator is permitted to use a small seasonally occupied summer camp along the Middle Fork Goodnews River that is accessible by float plane or motorboat. Commercial motorized use is limited to maintain opportunities for solitude.

Cape Peirce/Cape Newenham Area

This area of coastal headlands is approximately 242,000 acres in size.

Undeveloped and Natural—The Cape Peirce/Cape Newenham area provides some of the most important mainland nesting, staging, and haulout habitat on the North American continent for a number of waterfowl, marine mammals, seabirds, and shorebirds. A variety of

fish and terrestrial wildlife species are also found. These wildlife species depend on the unique, undisturbed habitat in this area.

Other Special Features—This area also has an especially long history as a traditional hunting and fishing place for Native Alaskans. Local traditions, oral history, and archaeological sites provide evidence of the area’s cultural and historical significance.

Osviak/Matogak Rivers Area

The lowland tundra, alpine tundra, and coastline of this southern part of the Refuge cover approximately 296,000 acres.

Other Special Features—Historically, this area contained several villages and was very important for local residents. Today, there are no year-round residents, but people from the community of Togiak continue to visit for subsistence activities. With the exception of a few small cabins, private lands remain primarily undeveloped. This coastal area of Togiak Refuge is used very little by people for recreation but remains a historically and culturally important area.

Hagemeister Island

This 73,890-acre island lies in Togiak Bay less than five miles from the Togiak Refuge.

Natural—The island provides important nesting habitat for seabirds and haulout areas for marine mammals; it is also home to many smaller mammals and landbirds. Hagemeister Island is one of the few parts of Alaska Maritime Refuge that supports runs of chum salmon and Dolly Varden.

Untrammled—In the past, a herd of domesticated reindeer was grazed on the island. The reindeer were removed in 1993, and the vegetation is recovering from overgrazing.

Kulukak Bay

The Kulukak Bay area encompasses approximately 438,000 acres of the Togiak Refuge between the Nushagak Peninsula and the Togiak River on the Bristol Bay coastline. Except for a short period during the commercial herring fishing season, this area receives relatively little use.

Nushagak Peninsula

This coastal lowland area encompasses approximately 521,000 acres in the southeast corner of the Refuge.

Natural—The Nushagak Peninsula is important calving and grazing habitat for the Nushagak Peninsula caribou herd. Because of numerous tundra ponds, lakes, and other wetland habitats, the Nushagak Peninsula supports large numbers of migrating waterfowl. This area supports some of the highest nesting densities of sandhill cranes in Alaska (Pogson and Cooper 1983).

Opportunities for a Primitive and Unconfined Type of Recreation—The Nushagak Peninsula is visited primarily by subsistence users. A number of large ponds, lakes, and sand beaches make this area easily accessible by plane for much of the year. During winters with adequate snow cover, access is also possible by snowmachine.

Existing Wilderness Recommendation

Several recommendations for designating refuge lands as wilderness were evaluated in the final Comprehensive Conservation Plan and Environmental Impact Statements for Togiak and

Alaska Maritime refuges. (USFWS 1985; USFWS 1988). The record of decision for the final plan included a recommendation that approximately 334,000 acres of the Togiak Refuge be designated as part of the National Wilderness Preservation System. This recommendation includes the Cape Peirce/Cape Newenham Unit and the Goodnews River Unit, which would include the remaining portions of the South and Middle forks of the Goodnews River currently not within the Togiak Wilderness (see Figure 3-16).

3.6.2 River Values

Rivers are among the most important features of the refuge environment: they both influence and reveal the Refuge’s topography. In the rugged landscape, rivers serve as important transportation corridors for people and wildlife. They provide essential spawning and rearing habitat for resident and anadromous fish, which in turn support wildlife concentrations. Collectively, these resources have long supported human subsistence users, and they also attract modern recreational visitors.

Table 3-9. Rivers possessing outstanding values

River Segment	Segment Length (miles)	Outstanding Values
Kanektok River	90	Fish, wildlife, recreation, cultural importance
Arolik River	40	Fish, wildlife, scenic, recreation
Goodnews River	47	Fish, wildlife, recreation, cultural importance
Trail Creek	27	Fish, wildlife, scenic, geology/topography, recreation
Ongivinuck River	16	Fish, wildlife, scenic, recreation
Narogurum River (Kemuk River)	28	Fish, wildlife, geology/topography, scenic, recreation
Togiak River	30	Fish, wildlife, recreation, cultural importance

Based on the general attributes described previously—topography and geology, fish and wildlife populations, recreation opportunities, and cultural importance—seven river segments

Figure 3-16.
**Wilderness Values
 Description Units**



Togiak National Wildlife Refuge

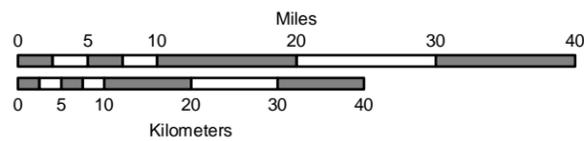
- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Yukon Delta National Wildlife Refuge
- Description Units

Private

- Native Private Fee
- Native Private Selected
- Other Private
- Regional Corporation Selected (subsurface only)

Other Public Land Managers

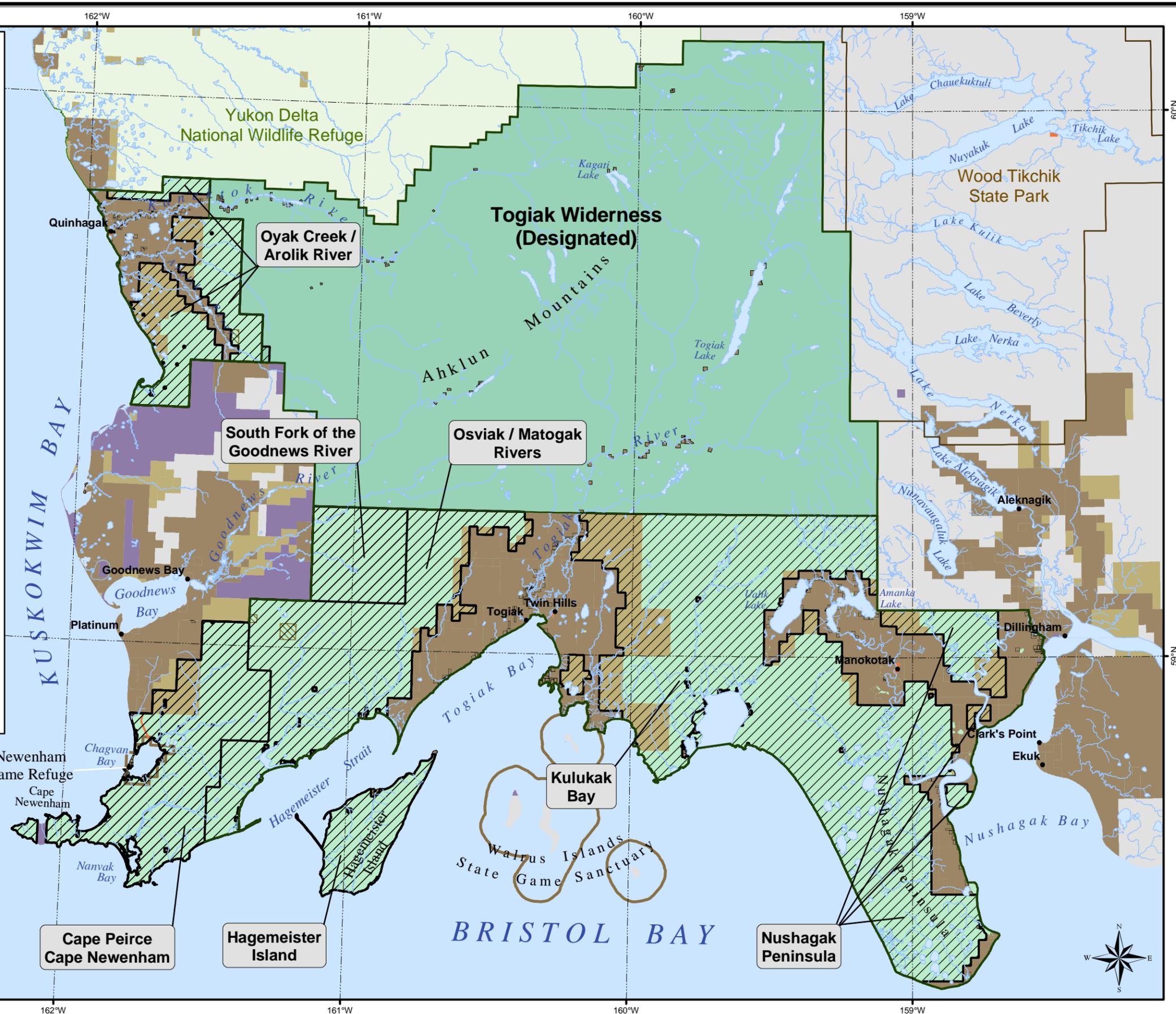
- Other Federal
- State Patent or TA
- State Game Refuge



Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeister Island (Alaska Maritime Refuge). Land status within Togiak Refuge boundary represents USFWS interpretation of BLM records, and is current to 5/2009. Land status outside Togiak Refuge boundary is section level data provided by the BLM. Small parcels may not be visible at this scale. This map does not address ownership of navigable waters or submerged lands.

14-0057



(Back of figure 3-16)

Figure 3-17.
River Values



Togiak National Wildlife Refuge

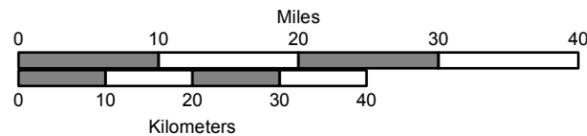
- Togiak Refuge - Minimal Management
- Togiak Refuge - Designated Wilderness
- Yukon Delta National Wildlife Refuge
- Exceptional Rivers

Private

- Native Private Fee
- Native Private Selected
- Other Private
- Regional Corporation Selected (subsurface only)

Other Public Land Managers

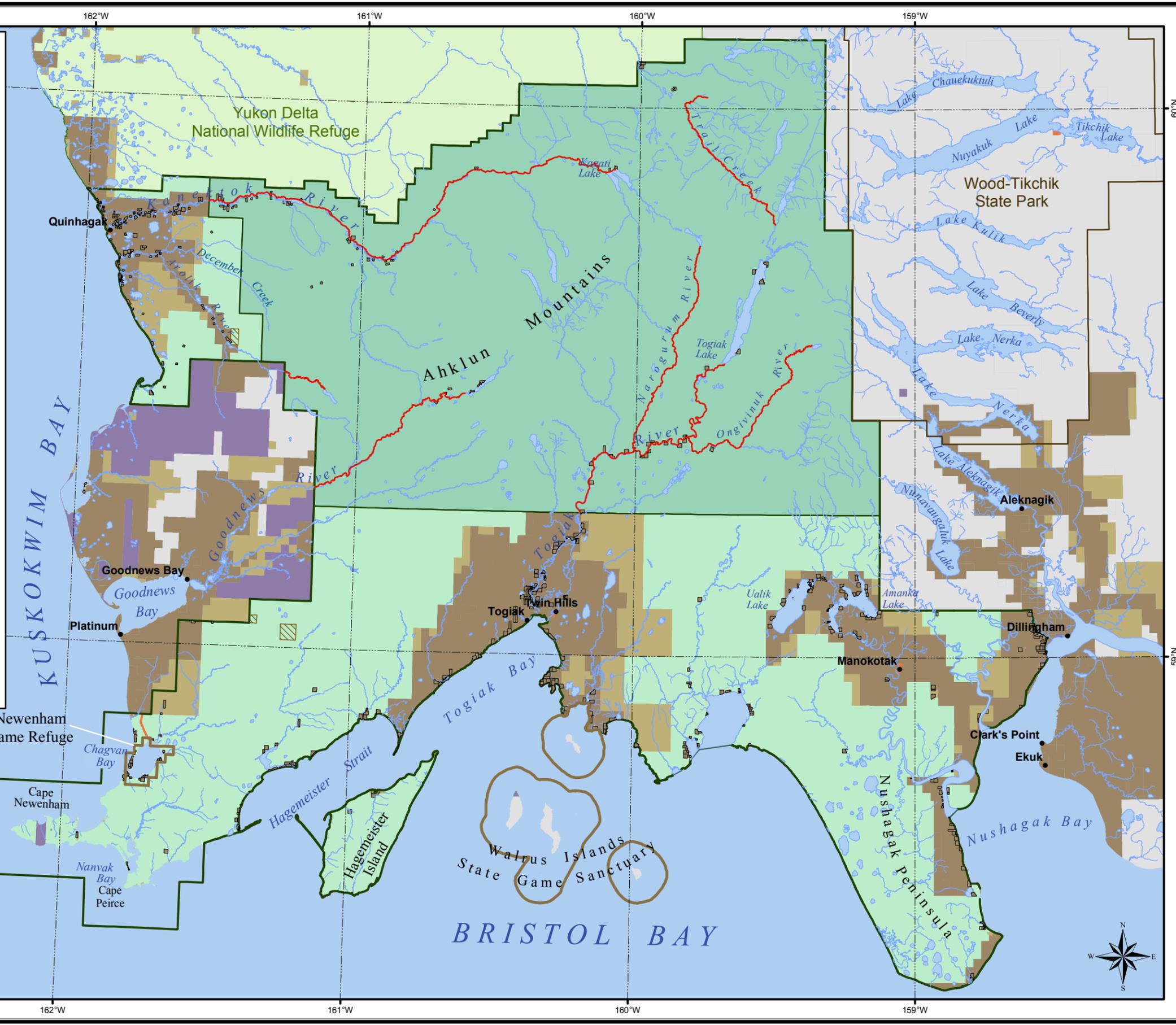
- Other Federal
- State Patent or TA
- State Game Refuge



Universal Transverse Mercator Projection - Zone 4. 1927 North American Datum.

The Togiak Refuge management area is comprised of Togiak Refuge and Hagemeister Island (Alaska Maritime Refuge). Land status within Togiak Refuge boundary represents USFWS interpretation of BLM records, and is current to 4/2010. Land status outside Togiak Refuge boundary is section level data provided by the BLM. Small parcels may not be visible at this scale. This map does not address ownership of navigable waters or submerged lands.

14-0160



(Back of figure 3-17)

have been identified as exceptional examples of Togiak Refuge rivers. The outstanding values of these rivers are described in the following text. The river segments are depicted in Figure 3-17. Table 3-9 presents the rivers, their length, and the values identified for each river.

Kanektok River

The Kanektok River starts at Kagati Lake in the north central portion of the Refuge, where it flows through a glacial valley surrounded by mountains and continues 90 miles through a wide open tundra coastal plain and into Kuskokwim Bay. It is a shallow low gradient system with several braided channels in the lower half.

Fish and Wildlife Populations—Five species of Alaska native Pacific salmon, as well as rainbow trout, Dolly Varden, Arctic char, Arctic grayling, northern pike, sheefish, and round whitefish, all live in this river. Burbot and lake trout are found in Kagati Lake. Several wildlife species such as brown bear, caribou, peregrine falcon, harlequin duck, and beaver live in the river corridor.

Recreation Opportunities—Since the 1970s, the Kanektok River has become an increasingly popular recreational fishing destination. Today, the Kanektok has a world renowned reputation for its diversity of salmon, large trout, and spectacular scenery. The Kanektok River flows from Kagati Lake, making aircraft access possible for many float anglers and recreational hunters. Motorboat access is also possible from the mouth of the river near the village of Quinhagak. Several commercial operators provide lodge and guide services along the Kanektok River. This mixture of transportation types, services, and activities creates a diversity of recreational opportunities along the Kanektok River from late May through September.

Cultural History—The Kanektok River has been and continues to be vitally important to the subsistence lifestyle of area residents. At Kagati Lake, where the Kanektok River begins, evidence has been found that indicates this river basin has been used continuously for approximately 9,000 years (Dumond 1987.) Today, subsistence use continues as people hunt, fish, trap, pick berries, and gather firewood along the Kanektok River. The village of Quinhagak at the mouth of the river is the largest population center in the area. Residents of Quinhagak use motorboats on the river to access subsistence fishing, hunting, and berry picking areas. A number of small cabins, fish racks, and set net sites scattered along the Kanektok River are evidence of its continuing role in rural Alaskan and Yupik Eskimo culture.

The upper Kanektok River was considered for inclusion in the National Wild and Scenic River System in 1983. The river was not designated because of local concerns and because the designated wilderness status of the uplands affords a significant level of protection without the additional designation.

Arolik River

The Arolik River flows nearly 40 miles from Arolik Lake through part of the Togiak Wilderness and on to Kuskokwim Bay.

Topography and Geology—The Arolik River begins at Arolik Lake, a remote glacially formed lake wedged between two high ridges. The upper ten miles is extremely shallow with a bed of coarse gravel and small cobble. It flows through a high plateau area of tundra with alder and willows along its banks. Below the confluence of East Fork and South Fork Arolik rivers, its volume nearly doubles but remains a narrow shallow stream of large gravel and cobble. After passing through Arolik Gap, the river enters the coastal plain and gradually

turns into a slow meandering stream with sharp cutbanks on either side. Approximately 10 miles from Kuskokwim Bay, the river divides into its North and South mouths.

Fish and Wildlife Populations—The Arolik supports populations of Arctic grayling, rainbow trout, whitefish, lake trout, Arctic char, and Pacific salmon. A variety of wildlife are found along the Arolik. Most species found along the river are small mammals, furbearers, and birds. Brown bear, moose, and caribou occasionally use the area seasonally.

Recreation Opportunities—Unlike other rivers used by anglers in the region, the Arolik receives little use or fishing pressure. Available areas for camping on public lands are severely limited. All camping on Native corporation land is restricted by a permit system. The number of permits issued by Qanirtuuq Incorporated is very low. Due to this very low amount of use, the Arolik River provides some of the best opportunities for extreme solitude, self-reliance, and quality fishing found anywhere in America. This combination of recreational and wilderness values is found on few other rivers in the region.

Goodnews River

The Goodnews River lies between the two other larger drainages, the Kanektok and Togiak rivers, and flows approximately 47 miles from its headwaters at Goodnews Lake to Goodnews Bay.

Fish and Wildlife Populations—The Goodnews River supports Pacific salmon, Dolly Varden, rainbow trout, lake trout, Arctic char, Arctic grayling, and whitefish. Wildlife such as brown bear, caribou, raptors, waterfowl, landbirds, beaver, otter, mink, and fox are also found along the river.

Recreation opportunities—In many ways, recreational opportunities are similar to those found on the Kanektok River but on a smaller scale. Opportunities are characterized by a more remote setting with less evidence of and contact with other people.

Cultural history—The human population in the Goodnews drainage is less than that in Kanektok or Togiak drainages, but like those areas, this area has a long history of subsistence use by rural residents and Yupik Eskimos. While the lower 22 miles of this river are most heavily used for subsistence, the upper portion is important for fishing, hunting, trapping, berry picking, and other subsistence activities.

Trail Creek

Trail Creek is approximately 27 miles in length and flows from its headwaters in the Ahklun Mountains to the Izavieknik River, which then flows into Togiak Lake.

Topography and Geology—Trail Creek differs from most other rivers in southwest Alaska and is characterized by its steep narrow canyon with high cliffs on either side (up to 150 feet). It has a steep gradient with deep pools, followed by long riffles and small rapids. Particle size ranges from coarse sand to large boulders. There are very few gravel bars. Beyond the river canyon are the tall peaks of the Ahklun Mountains. These features combine to create scenery found along very few other rivers in the Refuge or in the region.

Fish and Wildlife Populations—Trail Creek provides outstanding habitat for nesting raptors such as gyrfalcons, northern harriers, merlins, rough-legged hawks, sharp-shinned hawks, peregrine falcons, and bald eagles. The habitat that this river provides for harlequin ducks can be found on few other rivers in the region. In addition to wildlife such as caribou, moose, brown bear, fox, wolf, beaver, lynx, otter, and mink found along this and other rivers within

Togiak Refuge, black bear have also been sighted along Trail Creek. Because black bear have not been documented in other parts of the Refuge, this is a unique wildlife value in the region. Fish species including chinook, sockeye, chum salmon, Dolly Varden, rainbow trout, Arctic grayling, and Arctic char are also found in this river.

Recreation Opportunities—Some recreation use does exist along Trail creek, but it is mostly confined to the lower reach, which can be accessed by jet boat at higher water levels. For the adventurous and determined visitor, Trail Creek offers some of the most remote and challenging recreational opportunities within Togiak Refuge. A remote rugged tundra landing strip located almost two miles from Trail Creek is the closest access.

Ongivinuck River

The Ongivinuck River flows from the outlet of Ongivinuk Lake 30 miles to its confluence with the Togiak River.

Topography and Geology—A single main channel with occasional deep holes and gravel bars characterizes this river. Particle size ranges from sand to large cobble and small boulders. Much of the bank is undercut on the outside bends of the river, with gravel bars along the inside bends. The river is surrounded by towering mountains and rolling foothills. Cottonwood, willow, and alder line the banks. There are several gravel bars and deep holes along the river. This type of scenery is found on few other rivers in the region.

Fish and Wildlife Populations—Pacific salmon, rainbow trout, Arctic grayling, Dolly Varden, Arctic char, and round whitefish are found in this drainage. Wildlife such as brown bear, caribou, moose, porcupine, weasel, ptarmigan, raptors, waterfowl, landbirds, and beaver all live along the river.

Recreation Opportunities—The use of motorboats is practical along the lower reaches, and anglers use float planes, rafts, and motorboats to access the river. Recreational use is typically from anglers flying to Ongivinuk Lake and floating this tributary of the Togiak River. Recreational opportunities are characterized by this river's isolation and scenery, which provide a rewarding experience for self-reliant anglers of all experience levels.

Naragurum (Kemuk) River

The Kemuk is one of the five major tributaries of the Togiak River and flows approximately 28 miles from its source at Nenevok Lake to its confluence with the Togiak River.

Topography and Geology—A steep narrow canyon with several sections of rock cliff and several gravel bars characterize this river. It has a relatively steep gradient, and particle size ranges from coarse sand to large boulders. The river varies from 40 to 80 feet in width but generally is narrow. Willow, alder, and cottonwood trees grow along the banks.

Fish and Wildlife Populations—Pacific salmon, rainbow trout, Arctic char, Dolly Varden, and Arctic grayling are found in this river. Wildlife species include moose, brown bear, caribou, fox, porcupine, beaver, wolf, and various raptors.

Recreation Opportunities—Only the lower few miles are accessible by jet boat; the rest is accessible only by floating from Nenevok Lake. This river offers opportunities for a challenging recreational experience characterized by remoteness and solitude.

Togiak River

This segment of the Togiak River flows approximately 30 miles from the outlet of Togiak Lake to the Togiak Wilderness boundary near the confluence of Pungokepuk Creek.

Topography and Geology—There are five major tributaries to the Togiak: the Gechiak, Pungokepuk, Naylorun (Kashiak), Kemuk (Narogurum), and the Ongivinuck. A single main channel in the Togaik Wilderness area with occasional small islands, deep holes, and gravel bars characterize the river. Particle size ranges from sand to large cobble and medium size boulders. Much of the bank is undercut on the outside bends of the river with gravel bars along the inside bends.

Fish and Wildlife Populations—Pacific salmon, rainbow trout, Arctic grayling, Dolly Varden, Arctic char, lake trout, northern pike, and round whitefish are found in this drainage. Wildlife such as brown bear, caribou, moose, porcupine, weasel, ptarmigan, raptors, and beaver all live along the river.

Recreation Opportunities—Guided and unguided anglers use float planes and motorboats to access the river. Unlike other rivers within the Togiak Refuge, the Togiak River is wide enough and deep enough for float planes and most types of motorboats. The large gravel bars along the river provide a number of suitable campsites for float anglers as well. This combination of access and transportation provides a diversity of recreational opportunities in an undeveloped and remote setting.

Cultural History—The Togiak River (Elliot 1887) historically was home to one of the largest populations of Yupik Eskimos in southwest Alaska. Today, residents live near the mouth of this river in the communities of Togiak and Twin Hills. People use motorboats to access traditional hunting and fishing site areas, cabins, and other areas up to and beyond Togiak Lake. Several small cabins, fish racks, and other associated structures are built on private property along the river.

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4. Environmental Consequences

4.1 Introduction

The purpose of this chapter is to identify, describe, and compare the effects on the physical, biological, and socioeconomic environment of five alternatives, including current management, proposed for the Togiak National Wildlife Refuge Public Use Management Plan Revision. Current management provides the basis for comparing the effects of the action alternatives. The effects of management actions proposed by each alternative were assessed for key physical and biological resources and for key elements of the human environment.

Some actions (i.e., facility construction) in these alternatives would require site specific evaluation and National Environmental Policy Act (NEPA) documentation. That analysis will address any site specific environmental effects.

4.2 Physical Environment

None of the alternatives in this Plan are anticipated to have any effect on climate, landforms, geology, oil and gas potential, or leaseable or saleable minerals. While there are a few placer mining claims within the Refuge, activity has been negligible.

4.2.1 Effects on Water Quality

The Kanektok River is considered to be the area most likely to show impacts to water quality because it has the highest levels of public use on the refuge. Water-quality monitoring by the Refuge at the Togiak Wilderness Area boundary in the summer of 2001 found that Kanektok River water quality remains very clean and fecal indicator bacteria are present at levels that occur naturally. Standards established by the EPA for recreational waters are at little or no risk of being exceeded within the life of this plan (Collins 2001). Although use of the river has increased since 2001, levels of bacteria were so low at that time that we believe water quality will continue to be very good. Based on the information gathered for the Kanektok River, water quality of the Goodnews and Togiak rivers above the Togiak Wilderness Area boundary, with their lower use levels, is also expected to remain high for the life of this plan.

Under Alternative A, water quality will be evaluated periodically, rather than through an established monitoring program. This could allow some degradation to occur between evaluations. Under alternatives B, C and D a monitoring program will be established which would allow detection of degradation earlier and more rapid response. The standards for aesthetic indicators could actually cause remedial action earlier than those for water quality and could result in maintaining a better level of water quality. Alternative E would result in the maintenance of a better level of water quality from a much earlier time.

4.3 Biological Environment

Although all species and resources on the Refuge are important, certain species are more sensitive to disturbance, and others are representative of larger groups of species. For that reason, not all Refuge species are discussed in this chapter. An analysis of the effects of management actions on the biological environment has been conducted for the following:

4.3.1 Effects on Vegetation Conditions of Campsites and Trails

Cape Peirce. Under Alternative A, the current situation, there are two designated trails at Cape Peirce. Visitors walking between Sangor Lake and the wildlife-viewing area frequently use other routes, which are not designated. These trails currently are confined to single paths with impact only to vegetation directly in the paths. Two administrative cabins on the site (192 sq. ft. and 440 sq. ft.) are constructed on pilings. The impacts of these facilities on the vegetation is negligible in terms of the amount of disturbed area (less than one half acre), but trails, in particular are noticeable to visitors.

Impacts associated with facilities and trails in Alternative B would be the same as Alternative A (no action).

Alternative C includes tent platforms and associated facilities to accommodate up to 12 people. These facilities would likely consist of four to six tent platforms. The tent platforms would have a footprint of approximately 100 sq. ft each. Impacts would include the removal of vegetation in the footprint, compaction of soils and possible trampling of vegetation in the adjacent area and between the platforms and the other facilities (outhouse, food storage, and water source). The combined area which would be impacted is expected to be less than 1 acre.

Alternatives D and E include more structures at Sangor Lake and would cause more impact to soil and vegetation at the lake than the other alternatives. Each structure would have a footprint roughly equal to structures in the other alternatives, but there could be one cabin and additional tent platforms to accommodate up to 12 people at one time. In each alternative, facilities would be near one another, and impacts would be concentrated in one area. The combined area which would be impacted is expected to be less than 5 acres.

Kagati and Goodnews Lakes. Public use at Kagati and Goodnews lakes could have minor effects on vegetation cover, diversity, or abundance, but baseline information is not available. Kagati Lake is more than 1,000 feet in elevation. Plant communities at this elevation and latitude are slow-growing and do not recover quickly from disturbance (Hammitt and Cole 1987; Hampton and Cole 1988). If these Arctic tundra plant communities are damaged to the point that bare ground is exposed, erosion could occur.

Current site conditions and trends need to be established to determine what level of use these sites can support without lasting damage. Under Alternative A, the number of camping areas above the ordinary high water mark at both Kagati and Goodnews lakes would increase because there would be more times when more than three parties are camped at the lakes waiting to start their trips. Both of these lakes have two or three frequently used sites along the gravel lake shore below mean high water. These sites are accessible by float plane and are primarily gravel, generally flatter, have fewer insects and are easier to use which make them desirable sites for visitors. Managers also prefer the use of these sites because the surface is very durable.

Under Alternative A, the number of days with three or more float starts would be expected to increase, creating a need for additional camping areas. Because of accessibility by floatplane and proximity to the lake outlets, these additional sites would most likely be located on the uplands in fragile tundra. There would be few of these new sites, but as they became more frequently used, the trampling of vegetation could produce areas of bare ground and soil erosion. These impacts would represent long-term degradation of the wilderness environment in areas most visible to the public. Increased education about Leave No Trace camping and full implementation of the one-day camping limit at the Kagati Lake outlet would lessen these impacts.

Under Alternatives B, C, and E, additional campsites at Kagati and Goodnews lakes would be less likely. Since the parties will be spaced out, there would be little need for use of more than one or two camp sites and they will most likely be on the gravel lakeshore. As a result, campsite impacts at these headwater lakes would be less than in Alternative A (no action).

Alternative D would result in short-term impacts at Kagati and Goodnews lakes similar to those in Alternative A as visitation continues to increase. Guided use on the Goodnews River would increase to one trip every other day, and potential impacts to campsites could be realized more rapidly at Goodnews Lake as the number of guided groups using the area increased in the short-term. Over the long-term, impacts would stabilize due to limits on guided use.

4.3.2 Effects on Fish, Wildlife, and Key Species of Special Concern

This analysis focuses on those species used for subsistence and on those species most sensitive to human activity and environmental changes. These species are: rainbow trout, salmon species, bears, and moose.

Fish. Data currently available indicate fish stocks within the Refuge are healthy and should be able to sustain levels of commercial, subsistence, and recreational harvest projected for Alternatives A, B, and D, the alternatives that provide for increased use. Under Alternative C, the number of unguided float anglers would increase along the Kanektok and Goodnews rivers outside Chinook and coho salmon permitted-use seasons. This could cause the number of unguided float anglers targeting resident fish species, primarily rainbow trout and grayling to increase. Impacts to those species could be mitigated through the State Board of Fisheries, if necessary. Alternative E restricts the number of recreational anglers, many of whom target rainbow trout, so this alternative would pose the least risk for rainbow trout populations

Information regarding rainbow trout populations in the Osviak and Matogak rivers is very limited; therefore, impacts are difficult to determine. Rainbow trout are often the target species, are a resident species and are more susceptible to impacts than salmon species. From the limited biological sampling conducted, the rainbow trout population in the Osviak River could be comprised of a few older fish. Although public use along the Osviak River would be low under Alternative D, the level of exploitation could be enough to alter the historic size and age of this population because the number of individual fish is small.

Mammals. Anticipated increases in the brown bear population noted in Chapter 3, coupled with increases or changes in public use (i.e., guided versus unguided, new guide camps), have the potential to lead to an increase in the number of unreported kills, bear-human conflicts, bear habituation, and displacement from food resources (e.g., salmon streams) during peak use times by both bears and people. These potential impacts would be partially offset in all alternatives through increased bear safety education and monitoring.

Under Alternative D, additional guided motorized use along the Togiak River would be allowed. It is uncertain how this will affect the distribution of moose in this river drainage, but we anticipate impacts would be slight to moderate and would only persist during the coho salmon run when public use peaks each season.

Under Alternative D, additional guided motorized use would be allowed. The noise caused by the additional boat motors could displace some individual moose away from the river, possibly to areas where browse species and density is less desirable. Typically, moose displaced in such a manner would not move far, particularly if boats are moving along the river rather than

fishing in one spot. At the increased levels of use and duration anticipated, the impacts to individuals would result in short-term local disturbance. Impacts to moose populations would be undetectable.

Under Alternatives C, D, and E, impacts of additional visitation and structures at Cape Peirce would be offset by the use of a permitted wildlife viewing guide or Refuge staff to accompany visitors during peak use periods. The guides would ensure that visitor behavior would minimize disturbance.

Inventory and monitoring of these important wildlife species through the biological Inventory and Monitoring Plan would provide biologists and managers the necessary information to ensure that healthy populations and habitats were maintained during the life of this Plan.

Cumulative Effects. Subsistence harvest of all species would increase if local communities grow. Guided recreational angling would continue to increase downstream of the Togiak Wilderness Area boundary on lands and waters beyond the jurisdiction of the Service.

The rainbow trout population appears to be capable of sustaining the current level of harvest, but studies conducted by the Service, ADF&G, and others have indicated that the impact of recreational and subsistence fisheries would have the potential to change the length structure of rainbow trout populations in the Kanektok River and other rivers. Ongoing monitoring of fish populations by the Service and ADF&G should be adequate to detect and suggest necessary change to the management of these fish.

4.4 Human Environment

This section analyzes direct, indirect, and cumulative effects of the five management alternatives on visitor access and experience, local users, the local economy, and wilderness values. Estimates of impacts are primarily based on economic data and analyses presented in chapter 3, user survey data presented in chapter 3, and in Appendix E, and Refuge visitation records. Additional resources are cited where relevant.

The magnitude or intensity of various impacts is described as negligible, minor, moderate, or major. Negligible impacts would be real but barely detectable. Minor impacts would be readily detectable, but they would affect only a few individuals or would be otherwise very localized. Moderate impacts could affect access or experiences for up to half of a particular user group in that area (e.g., 50 percent of unguided river visitors); or they could modify the attributes of a setting at several specific locations; or they could affect jobs and household incomes at the community level. Major impacts could affect access or experiences for whole user groups; or they could alter the overall character of a setting; or they could affect jobs and household incomes in multiple communities.

4.4.1 Effects on Cultural Resources

Management decisions and public use would affect cultural resources directly and indirectly. Direct effects would include potential impacts from developments such as cabins, hardened camping areas, boat landings, outhouses, etc. Another direct effect of greater public use would be the increased likelihood of damage to sites from looting or vandalism.

Of possibly greater concern would be indirect effects resulting from uses such as camping, ad-hoc trails, use of “cat holes” for waste, etc. These impacts would be especially severe on ephemeral or surface sites.

Loss of vegetation from camp sites or in trails, along riverbanks etc., would expose artifacts to illegal collection, breakage and loss of context. Erosion of devegetated areas would cause physical destruction of sites with all of its artifacts, features and associated information potential. Compaction of the ground would obliterate surface features and break and scatters artifacts.

Under all alternatives, cultural resources could be at risk of damage, primarily from public use activities and management. Areas around Kagati, Goodnews, and Togiak lakes, Cape Peirce, and all major river drainages include cultural resources which are eligible for inclusion on the National Register of Historic Places. Additional assessment of these resources is needed.

4.4.2 Effects on Visitor Access

Alternative A. Under current management, unguided visitor access to Togiak Refuge would be largely unrestricted. Certain laws and regulations govern means of access, but for the most part, there would be no restrictions on the number of unguided visits or visitors to the Refuge. One exception is at Cape Peirce, where access has been limited to one flight and six people per day. At recent use levels, this restriction has not been enforced and has not been a limiting factor (i.e. everyone who wants to visit is able to). Use levels increased from an average of less than three flights per year during the 1990s to about 15 flights per year from 2000 through 2003. If that trend were to continue, the current management direction could eventually prevent some people from visiting Cape Peirce. However, visitation demand at Cape Peirce is linked to the presence of walrus, which has proven to be highly variable and unpredictable. It is unlikely, based on recent visitor and walrus use patterns, that the existing management direction would be a limiting factor for future visitor access. Therefore, the impact on visitor access would likely be negligible.

On the popular Kanektok River, the absence of unguided visitor access restrictions would allow continued growth in the number of annual float starts. According to reports from permitted air-taxi operators, the average number of annual float starts increased from 36 during the period 1993-1996 to 52 during the period 2001-2004. (Numbers dropped substantially in 2005-06 due to the sale and temporary suspension of operations of a major commercial service provider in Dillingham¹). If use numbers return to near 2004 levels (as expected) and the previous rate of growth holds steady, there would be approximately 76 unguided, annual float starts within 15 years. It is possible, that the rate of growth would slow slightly as higher use and associated impacts reduce demand. Absent any other confounding factors, maximum use would likely be between 70 and 76 unguided float starts per year by 2020.

¹ Freshwater Adventures did not operate normally for much of 2005, which caused a substantial drop in visitor use for that year. It is not clear if low numbers in 2006 were caused by limited availability of services in the previous season or if they represent a new starting point from which to measure future trends. Given the overall use-trend during the last two decades, it is reasonable to expect that use will continue to increase moderately during the life of this plan. Because of the anomalous 2005 season, analyses in this chapter are based only on data collected through 2004.

Unguided visitation on the various forks of the Goodnews River would continue to fluctuate annually as it has over the past 15 years. Visitation could be affected by continued growth on the Kanektok River if crowding and competition could cause some visitors to choose the Goodnews River as an alternative destination. The magnitude of this effect is uncertain, but the overall impact on unguided visitor access would likely be negligible.

Guided float use on the Kanektok River would continue to be limited to one launch every other day during the summer and early fall, and that use-level would not be allowed to increase under current management. Some would-be guided clients might be unable to visit as demand rises. This impact likely would be minor (affecting a few individuals who would not or could not visit otherwise).

Guided float and motorized access on the forks of the Goodnews River would be allocated through a competitive bid process. One motorized use permit would continue to authorize the use of up to nine boats for up to 18 clients at one time on the North Fork. On the Middle Fork, one motorized use permit would continue to authorize up to two boats and four clients at one time. Float use would continue to be limited to one trip per week (up to 12 people) on the North Fork. No guided float permits would be awarded for the Middle Fork. Guided motorized use on the North Fork has historically been well below permitted levels (less than 20 total trips per year), so it is unlikely that this restriction would functionally limit guided visitor access during the life of this Plan. Guided float use on the North Fork presently occurs at near-permitted levels; if demand increased in the future, some would-be guided float clients could be prevented from visiting. This impact likely would be minor (affecting a few individuals who will not or cannot visit otherwise). Visitor demand for guided float opportunities on the Middle Fork has been extremely low due to difficult conditions (boats must be dragged a long distance except when water levels are very high), so the absence of a commercial float permit for that river would have only negligible effects on future visitor access.

On the Togiak River, guided visitor access would continue to be limited to seven motorboats (up to 28 people) per day and two float trips per week. Demand for guided float trips has been well below permitted levels, so this restriction would not functionally limit access, and it is unlikely that it would have any effect during the life of this Plan. Guided motorized use currently has occurred at well below permitted levels, so the permit restriction also would have no functional effect on visitor access. Use has been relatively stable for more than 10 years, and that trend would be expected to continue in the future.

Alternative B. Under this alternative, visitor access to Cape Peirce would remain essentially unchanged, except when demand is high, 50 percent of daily permits would be allocated for commercially guided visitors, and the remaining 50 percent would be allocated to unguided visitors. Unused permits would be available to either type of visitor from a common pool. At recent and likely future use levels, this alternative would have no impact on visitor access at Cape Peirce.

Unguided visitor access to the Kanektok River would be restricted through a limited permit system to one float start every other day (alternating with guided float starts) from June 1 through September 23². If every available day were used, there could be as many as 57 unguided float starts permitted during this period (each including up to four boats and 12 people). From 2001 to 2004, there was an annual average of 52 unguided launches (Table 4-1).

² The limited permit system would only apply under “high-use” conditions, defined as two consecutive seasons where total unguided use was greater than two-thirds of the maximum potential allocation. By this definition, “high-use” is about 40 float starts per season, which would be equivalent to the average number of guided float starts that has been allocated through the prospectus system.

Under Alternative A, there could be as many as 76 unguided float starts by 2020, so Alternative B could ultimately deny access to as many as 19 groups. Other groups who would not, or could not, visit at other than their preferred times could also be indirectly prevented from floating the river. Overall, this would constitute a moderate negative impact on visitor access because one-quarter to one-third of potential visitors (in a given year) could be denied access.

Unguided visitor access to the Goodnews River (all forks) would be limited to the current level (approximately 44 starts per year³). Given that unguided visitor use on the river has been relatively stable since 2000, restricting use would not have any immediate or short term effects on visitor access (Table 4-2). Over the longer term (more than 10 years), demand could increase to a level at which a few groups would be unable to visit each year. This effect could be magnified if visitors who are unable to access the Kanektok River looked to the Goodnews as an alternate destination. Overall, the proposed restriction likely would have a minor to moderate negative impact on visitor access.

The effects on access for guided visitor float and motorboat opportunities would be the same as those described under Alternative A. Under Alternative B, the commercial permit awarded for guided motorized use on the Middle Fork Goodnews River would allow for one additional boat and up to four additional people each day. However, given that visitation does not appear to be limited by existing permit restrictions (use has been below permitted levels and has not grown over the last decade), allowing for additional guided use would have no practical effect on visitor access.

On the Togiak River, guided visitor access would continue to be limited to seven motorboats (up to 28 people) per day and two float trips per week. Demand for guided float trips has been low, so this restriction would not functionally limit access, and it is unlikely that it would have any effect during the life of this Plan. Guided motorized use currently has occurred at well below permitted levels, so the permit restriction also would have no functional effect on visitor access. Use has been relatively stable for more than 10 years, and that trend would be expected to continue in the future.

Alternative C. Under this alternative, the existing limit of one flight per day and six people at one time at Cape Peirce would be increased to two flights per day and 12 people at one time, and the permit requirement would be waived altogether at low use levels. In addition, facilities such as tent platforms, a food storage area, and an outhouse could be constructed at Sangor Lake. At current and likely future use levels, this action would have little practical effect on visitor access. Facilities at Sangor Lake could attract a few more visitors, but it is unlikely that the availability of tent platforms and an outhouse would motivate a change in the current use pattern. If walrus again become a consistent and predictable attraction at Cape Peirce and visitor demand increases accordingly, this alternative would substantially increase visitor access. In this scenario, this action could have a moderate to major positive effect on visitor access.

Unguided visitor access to the Kanektok River would be limited to one trip start every other day during peak use seasons (June 25 to July 15 and August 10 to September 7)⁴. During the rest of the year, there would be no limits on the number of unguided trip starts. From 2001 to

³Unguided use-limits within the Goodnews drainage would only be enforced in years when unguided use on the Kanektok also would be limited.

⁴ Similar to Alternative B, the proposed limits would only be applied under high-use conditions.

2004, there was an average of 14 trip starts during the early peak season and 19 starts during the late peak season. Under Alternative C, 11 starts would be permitted during the early peak season, and 15 would be permitted during the late peak season (Table 4-1). Thus, about 20 percent of the visitation currently occurring during the peak seasons would be re-allocated to different time periods or displaced altogether.

Much of the growth in Kanektok River visitation has occurred outside the early peak season. Visitation during the early peak season has remained consistently at the level of 14 or 15 trip starts for more than 10 years, so it is unlikely that it would change much (up or down) in the absence of a restriction. During the late season, however, use has increased from about 12 starts a decade ago to about 19 starts in recent years. Some of the growth has been attributed to hunters targeting a newly available caribou harvest opportunity in the early fall. It could be that use levels during the late season will now begin to level off, or use levels could continue to grow at a slower rate; it is unlikely that growth during this period would continue at the recent high rate because there already would be multiple trip starts taking place on most available days.

Assessing the magnitude of impact from the proposed access limits is difficult because visitors displaced from the peak seasons could still come at other times of the year. At current use levels, a total of up to seven groups would be unable to access the river (assuming they would not or could not visit at other times). This number could grow to nine or 10 groups by 2020 if demand for peak season access continues to grow, which would be equivalent to almost 15 percent of total projected annual use. However, at least a few groups likely would choose to visit at other times, so it is likely that fewer than 15 percent of unguided groups would be displaced in a given year. Overall, this would constitute a moderate negative impact on unguided visitor access to the Kanektok River.

On the Goodnews River, unguided float starts would be limited to one every other weekday and one on each weekend day⁵. This would create a Tuesday, Thursday, Saturday, and Sunday unguided launch pattern and would allow about 12 starts during the June 25 to July 15 peak season, and about 16 starts during the August 10 to September 7 peak season. During the rest of the year, there would be no limits on the number of unguided trip starts.

From 2001 to 2004, there was an average of nine trip starts during the early peak season and 18 starts during the late peak season; thus, this alternative would cause some redistribution of use and possibly some outright displacement of would-be visitors as well (Table 4-2). The immediate impact of this alternative would be that all groups wishing to access the Goodnews River on a Monday, Wednesday, or Friday during peak seasons would be bumped to an adjoining day. Under recent demand conditions, up to two float groups could be prevented from visiting during the fall peak season. Consistent with the previous discussion on Kanektok River use, the proposed limits likely would constitute a minor negative impact on unguided visitor access to the Goodnews River watershed.

Guided motorized access to the North Fork Goodnews River would be reduced from the current maximum permitted level of nine boats per day to one boat and three people per day. This action would have the immediate effect of reducing group sizes; visitors wishing to travel in groups larger than three would not be able to access the North Fork via guided motorboats. The practical negative effect of this action would be negligible, however, because demand for

⁵ Similar to Alternative B, unguided use-limits within the Goodnews drainage would only be enforced in years when unguided use on the Kanektok is also limited.

guided motorboat access on the North Fork is low; use has averaged just 17 trips per year since 1990.

Guided float visitors would have the option of visiting either the North or Middle forks of the River under this alternative. This would represent a minor positive impact on visitor access because currently there has been no guided float access on the Middle Fork.

No changes in Togiak River management were proposed, so the effects of this alternative would be the same as those described under Alternative A.

Alternative D. Under Alternative D, the existing limit of one flight per day and six people at one time at Cape Peirce would be increased to two flights per day and 12 people at one time, and only commercially guided clients would be allowed to visit. In addition, moderate facilities such as tent platforms, food storage areas, a cabin, and an outhouse could be constructed at Sangor Lake. This alternative would have a major negative effect on unguided visitors, because their opportunity to access Cape Peirce would be eliminated altogether. Facilities at Sangor Lake could attract a few more guided visitors, but it is unlikely that facilities alone would change the current level of use. If walrus become a consistent and predictable attraction at Cape Peirce and visitor demand increases accordingly, this alternative would substantially increase guided visitor access. In this scenario, this action could have a major positive effect on guided visitor access.

Effects on unguided visitor access to the Kanektok and Goodnews watersheds would be the same as those described under Alternative A (Tables 4-1, 4-2).

Opportunities for guided visitor access to the Goodnews watershed would be expanded under this alternative. Motorized use on the North Fork would be allowed to grow from 18 clients per day (currently allowed) to 27 clients per day, and one temporary support camp would be allowed. One additional boat and two clients per day would be permitted for day use only (no camping). On the Middle Fork, motorized use would be allowed to grow from two boats and six clients per day to three boats and 10 people per day. Float access on the North Fork would be increased from one trip per week to one trip every other day, which would be equivalent to about 40 additional trip opportunities. On the Middle Fork, where no guided float access is currently allowed, one trip per week would be permitted.

At current and projected use levels, raising motorboat limits would have no practical effect on guided motorboat visitor access. If, for unforeseen reasons, demand increased substantially, this alternative could have a moderate positive effect on guided motorboat access to the Goodnews watershed. Guided float use on the North Fork has been variable over the past 10 years, so future demand is uncertain. If there were demand for more than one trip per week, this alternative would have a moderate to major positive effect on guided visitor access. On the Middle Fork, where river conditions make float access very challenging, demand would be expected to remain low. Therefore, this alternative would have small positive effects on guided visitor access there.

Alternative E. Under this alternative, the effects on visitor access to Cape Peirce would be the same as those described under Alternative C, except that, under conditions of high demand, 30 percent of permits would be allocated for guided visitors and 70 percent for unguided visitors.

Unguided visitor access to the Kanektok River would be restricted through a limited permit

system to one trip start every three days with a maximum of three boats and nine people per trip. For the season June 1 to September 23, there would be approximately 37 unguided float starts permitted. From 2001 to 2004, there was an annual average of 52 unguided trip starts with an average of about four people (two boats) each. Limiting group size under this alternative would have only a negligible impact on unguided visitor access, but limiting trip starts would deny access to at least 15 groups immediately and up to 39 groups by 2020 (given maximum projected demand). Overall, this would constitute a major negative impact on visitor access because one-quarter to more than one-half of potential visitors (in a given year) could be denied access (Table 4-1).

Unguided visitor access to the Goodnews River (all forks) also would be limited to one trip every three days under this alternative. From 2001 to 2004, there was an annual average of about 44 unguided trip starts within the Goodnews watershed with an average of about four people (two boats) each. Limiting group size would have only a negligible impact on unguided visitor access, but limiting trip starts would deny access to a few groups immediately and some additional groups, depending on the level of demand in the future. It is likely, given that a substantial proportion of groups would be displaced from the Kanektok under this alternative, that some of them would choose the Goodnews River as an alternative and thereby increase future demand. The greatest displacement is likely to be to the Goodnews River, which is nearby and provides the closest substitute experience. Other displaced visitors are likely to be spread to rivers throughout the region or to other locations. The impacts to each of those rivers would be less than for the Goodnews River. Given that at least four groups likely would be displaced immediately and some larger number likely would be displaced each year in the future, this alternative would have a minor negative effect in the short term and a minor to moderate negative effect over the life of this Plan (Table 4-2).

The effects of this alternative on guided visitor access would be the same as those described in Alternative A.

No changes in Togiak River management were proposed, so the effects of this alternative would be the same as those described under Alternative A.

Table 4-1. Average unguided float starts: Kanektok River

	Total Groups (June 1- Sept 23)	Early Peak Season	Late Peak Season	Total Peak Season
1993-1996	36	15	12	27
2001-2004 ⁶	52	14	19	33
change	16	-1	7	6
Max use Alt. A	unlimited	unlimited	unlimited	unlimited
Max use Alt. B	57	11	15	26
Max use Alt. C	unlimited	11	15	26
Max use Alt. D	unlimited	unlimited	unlimited	unlimited
Max use Alt. E	37	6	8	14

⁶ Data for 2005-2007 are included in Chapter 3 Affected Environment and show a continued upward trend. Additional analysis in this chapter is considered unnecessary.

Table 4-2. Average unguided float starts: Goodnews River watershed

	Total Groups (June 1- Sept 23)	Early Peak Season	Late Peak Season	Total Peak Season
1993-1996	40	9	21	30
2001-2004 ⁷	41	9	18	27
change	1	0	-3	-3
Max use Alt. A	unlimited	unlimited	unlimited	unlimited
Max use Alt B	44	13	15	28
Max use Alt C	unlimited	12	16	28
Max use Alt. D	unlimited	unlimited	unlimited	unlimited
Max use Alt. E	37	6	8	14

4.4.3 Effects on Visitor Experiences

Alternative A. Under current management, visitor experiences at Cape Peirce primarily have been influenced by the primitive natural setting and the presence or absence of walrus and other wildlife for viewing. Because only one flight per day has been permitted to land there, visitors have been unlikely to encounter other groups, and the very few visitors who choose to stay overnight have been unlikely to have others camping within sight or sound of them. Nothing proposed under current management would be likely to affect these aspects of visitor experiences.

The results of surveys conducted in 1995 and 2001 (Appendix E) indicated that a substantial majority of float and motorboat visitors to the Kanektok, Goodnews, and Togiak rivers (guided and unguided) felt that “catching fish,” “being in a natural place,” and “being in a wilderness” were very important reasons for visiting the river. Most visitors also felt that “scenery,” “viewing wildlife,” and “opportunities for solitude” were very important. Surveyed visitors indicated that the factors most likely to negatively influence their experiences were competition for fishing and camping sites, seeing unburied human waste and litter, encountering other anglers in motorboats, and seeing large groups (more than four boats or eight people). These survey data provide evidence that most visitors on these rivers seek an experience that can be characterized as a “wilderness fishing experience,” which is defined as fishing with a relatively high likelihood of success in a primitive natural setting with relatively few other people or signs of people. This definition fits the context of the upper segments of these rivers and was developed specifically for the Togiak refuge. The definition is supported by seminal work in fisheries management that determined water quality, natural beauty, and privacy to be important elements of a quality fishing experience (Moeller and Engleken 1972). These authors reported that water quality, natural beauty, and privacy (similar to being in a primitive natural setting with relatively few people or signs of people) were more important to respondents’ overall enjoyment of a fishing trip than either the size or the number of fish caught.

⁷ Data for 2005-2007 are included in Chapter 3 Affected Environment and show a continued upward trend. Additional analysis in this chapter is considered unnecessary.

Most survey respondents in 2001 did not feel crowded, and most did not report unacceptable conditions with respect to litter or other negative influences. However, most respondents also indicated that they would have preferred more solitude and less evidence of other users than what they actually experienced. About 20 percent of them reported that the amount of litter they saw exceeded their personal tolerance levels (the point at which their experience is diminished). On the Kanektok River, an additional 40 percent of respondents reported that the amount of litter they experienced was right at their tolerance threshold; and on the Goodnews River, 35 percent of respondents reported the same. In other words, more than half of respondents from the Kanektok and Goodnews Rivers reported that the amount of litter they saw was at or above their personal tolerance levels. At least one-third of visitors to these rivers also indicated that other important factors (e.g., competition, encountering others—see Appendix E) were at or above their personal tolerance thresholds.

Under current management, unguided visitor use on the Kanektok River would be expected to increase moderately, eventually reaching 70 to 76 annual float trip starts by 2020. Guided use, which is already limited, would be expected to continue at current levels. By 2020, virtually all float groups would be forced to begin their trips on the same day as one or more other groups. Visitors in these groups would be more likely to camp within sight or sound of each other, compete for campsites and fishing holes, and feel crowded, but the magnitude of this impact is uncertain.

Cole (2001) demonstrated that visitor use and social and ecological impacts have a curvilinear relationship—that is, impacts tend to begin leveling out as use grows rather than continuing to increase in a linear fashion. Therefore, a 30 percent increase in use would not necessarily lead to a 30 percent increase in litter, competition, or crowding. In fact, some impacts like litter may actually be reduced by changing visitor behaviors even as total use increases. Further complicating matters is the fact that visitors' personal tolerance thresholds appear to have changed over time; 2001 survey respondents were generally more tolerant of experience impacts than 1995 respondents. These factors are likely to mitigate some of the negative impacts associated with future use increases on the Kanektok River. However, given that at least one-third of Kanektok visitors (according to 2001 survey results) already feel that use-related impacts are at or above their personal thresholds, it is reasonable to expect that additional increases in use would result in diminished experiences for a substantial proportion of visitors. It is likely that this negative impact would be minor to moderate in the short term (affecting a few individuals or groups as use increases slightly over the next five years) and moderate to major over the life of this plan (affecting multiple groups or whole visitor segments by 2020).

On the Goodnews and Togiak rivers, where visitor use would be expected to increase only slightly, negative impacts on visitor experiences would be proportionally smaller: negligible to minor over the next five years and minor to moderate over the life of this plan.

Alternative B. Under this alternative, visitor experiences at Cape Peirce would continue to be primarily influenced by the primitive natural setting, and the presence or absence of walrus and other wildlife for viewing. The proposed 50/50 allocation of permits for guided and unguided visitors could lead to a situation, under conditions of high demand, in which a few people are unable to visit in the way they would prefer. However, this scenario would be unlikely. The effects of this proposed action likely would be the same as those described in Alternative A (i.e., no impacts).

Unguided visitor access restrictions proposed for the Kanektok and Goodnews watersheds would prevent use levels from increasing much beyond current levels. Guided use would also

continue at current levels except on the Middle Fork of the Goodnews River, where use would be allowed to increase by up to one boat and four people per day. In addition, float groups on the Kanektok River would be required to carry out solid waste if standards for water quality are exceeded. Under this alternative, a portion of river visitors would continue to encounter conditions that diminish their experiences, but the negative impacts associated with increased use would not occur. On the Kanektok River, in the short term, the proposed limited permit system would have a minor positive effect on both guided and unguided visitor experiences by spreading out use and reducing the likelihood of crowding and competition. Over time, if demand for Kanektok River experienced grows as expected, the proposed action would have a moderate to major positive impact by preventing or mitigating a host of negative impacts associated with visitor use. Positive impacts from the permit system would be proportionally smaller on the Goodnews River where current use and projected demand are lower; in the short term, they likely would be negligible, but over time—especially if demand increases as some users are displaced from the Kanektok River—the magnitude of positive impacts could be moderate to major.

While the proposed permit system and access restrictions would reduce use-related impacts, there would be an experience tradeoff in terms of reduced visitor freedom. Some unguided visitors might feel constrained or hassled by the requirement that they obtain a permit before visiting. However, research suggests that wilderness visitors feel less constrained by regulations imposed outside wilderness such as permit requirements than they do by regulations that direct their behaviors or travel plans within wilderness such as campfire restrictions and designated campsites (Shindler and Shelby 1993). Moreover, survey results from 1995 and 2001 indicate that most Kanektok and Goodnews visitors plan their trips more than six months in advance and travel long distances to reach the rivers; the process of obtaining a permit likely would be a very small addition to their overall trip planning efforts. Therefore, experience impacts would be negligible for visitors who are able to obtain permits. Some visitors might also feel hassled or constrained if the proposed waste pack-out requirement was implemented. However, pack-out requirements are common and relatively popular on other rivers around the nation, and many Togiak Refuge visitors are likely to be familiar with them. Given the convenience and growing acceptance of modern waste pack-out technologies, the negative impacts associated with this requirement likely would be negligible as well.

Of greater concern, perhaps, would be the potential impacts to visitors who are unable to access the rivers due to the limited number of permits and start days available under this alternative. In 2004, there were 33 unguided groups that began their Kanektok River trips on the same day as another group. Under the proposed limited permit system, each of these groups would be required to begin their trips on some other available day. At current use levels, there are enough available days between June 1 and September 23 that all groups could be accommodated if they were spread evenly through the season. However, at least some groups likely would be unwilling or unable to visit at another time, and would be effectively denied access. If Kanektok River demand increased over time as expected, the proportion of unguided groups that are unable to visit or unable to visit at their preferred times would increase as well.

Short-term negative impacts on Goodnews River unguided visitor experiences would be similar in nature but smaller in magnitude compared to those described for the Kanektok River. In 2004, on the Goodnews River, there were just five unguided groups that began their trips on the same day as another group. These groups would be required to start on some other available day, and those who are unable or unwilling to do so would be denied access. The proposed limits could accommodate current use levels, but future unguided growth would not be allowed.

Under current management conditions, demand on the Goodnews River would be expected to increase only slightly over the life of this Plan. If unguided use were limited on the Kanektok, however, demand could increase as would-be Kanektok visitors seek alternative opportunities.

The nature and magnitude of impacts to visitor experiences on both rivers would vary according to visitor characteristics. Guided visitors likely would benefit from reduced overall use without experiencing any negative impacts from access restrictions. For unguided visitors who could easily modify the dates of their trips, the short-term negative impact would be negligible. For those with little or no flexibility, the impact might be considered major. Over the longer term, overall impacts would be moderate to major—by 2020, up to 25 percent of would-be visitors could be unable to access the rivers at any time between June 1 and September 23 (assuming 57 available start days and estimated future demand for up to 76 starts).

Despite the potential negative impacts on their access opportunities, 44 percent of unguided visitors surveyed in 2001 indicated that they would support or strongly support limits on unguided float trip starts. Among guided visitors, the proportion in support of unguided limits was 79 percent. When responses from all visitors were considered together, 64 percent indicated support for limits on unguided trips. The main reason for this support was the belief that limits would improve visitor experiences. Among unguided visitors, about 40 percent of respondents agreed that limits would improve experiences; among guided visitors, nearly 80 percent agreed (see Figures E-2 and E-3 in Appendix E).

Alternative C. Under this alternative, visitation at Cape Peirce would be allowed to increase to two flights per day and up to 12 people at one time. In addition, some minimal facilities to support overnight stays would be provided. In times of high demand, visitors could frequently be on-site with one or more other groups. This represents a substantial change compared to the current experience opportunity in which visitors have been virtually guaranteed to be alone with the other members of their groups. Given current and expected future demand, however, this alternative likely would have negligible to minor negative impacts on Cape Peirce visitor experiences. The provision of tent platforms, a food storage area, and an outhouse could have a minor positive impact on the experiences of visitors who prefer a slightly more developed setting.

On the Kanektok River, both positive and negative impacts would be similar to those described under Alternative B. However, the limited permit system for unguided visitors only would be imposed during the early (June 25 to July 15) and late (August 10 to September 7) peak seasons, so most impacts would be concentrated during those times. Under this alternative, annual, unguided, peak season use—which has recently averaged 33 float-trip starts—would be limited to 26 starts. In the short term, up to seven unguided groups would be required to visit at another time of year or be displaced altogether. At the same time, visitors who obtain a permit would be less likely to encounter or compete with one another during their trips. Over the longer term, demand for peak season use is expected to increase slightly, so negative impacts (in the form of groups displaced or denied access) and positive impacts (in the form of reduced competition and crowding) would be slightly greater.

On the Goodnews River, unguided float starts would be limited to one every other weekday during peak seasons, but two starts would be allowed on weekends. This would result in a Tuesday, Thursday, Saturday, and Sunday launch pattern with up to 28 total unguided starts allowed during the combined peak seasons. Recent peak season use has averaged about 27 trips, so negative impacts in the form of displaced visitors would be minor. If limits on the Kanektok River led to substantially increased demand for Goodnews River experiences, a

greater number of would-be groups could be displaced; however, positive impacts in the form of reduced competition and crowding would increase as well. Overall, the affects of this alternative on unguided Goodnews visitor experiences would be similar to those described above for the Kanektok River.

The few, minor changes proposed for guided use under this alternative would have negligible impacts on visitor experiences. The proposed waste-management actions would have essentially the same impacts as those described in Alternative B.

Alternative D. Under this alternative, actions at Cape Peirce and Sangor Lake would have impacts similar to those described in Alternatives B and C. One difference is that all visitors would be required to visit with a permitted commercial guide. The opportunity for an unguided experience would be eliminated altogether, and for the few people who prefer to visit without a guide each year, this action would constitute a major negative impact. Some dimensions of guided experiences may be qualitatively different than unguided experiences—for example, unguided experiences may involve more self-reliance or skill—but since most visitors already choose to visit with guides, the overall effect on their experiences would be minor.

Effects on Kanektok and Goodnews visitor experiences would be the same as those described under current management (Alternative A). New or additional guided experience opportunities would be created under this alternative on the Goodnews, Togiak, Osviak, and Matogak rivers. Since demand for these opportunities is low and is expected to remain low, the overall effect of these new opportunities on visitor experiences would be negligible.

The effects of proposed waste management actions would be the same as those described in Alternative B.

Alternative E. Under this alternative, the effects of proposed actions at Cape Peirce would be similar to those described in the other action alternatives. Only 30 percent of use would be allocated to commercial guides, so it is possible that future high demand for guided experiences could exceed capacity. This scenario, however, is unlikely. One additional difference in this alternative is that facilities to support cultural and natural history interpretive programs could be constructed at Sangor Lake. Such facilities likely would enhance certain dimensions of visitor experiences (e.g., learning and appreciation), but they could also have a negative impact on the primitive setting that currently influences visitor experiences.

The effects of proposed unguided use limits on the Kanektok and Goodnews rivers would be similar in nature but greater in magnitude compared to the effects described in Alternative B. Unguided users on both rivers would be limited to one trip start every three days. Crowding and competition for all users would be reduced from current levels, and future growth of these impacts would essentially be prevented. Guided visitors would enjoy enhanced experiences immediately and into the future at no cost in terms of access. Unguided visitors, on the other hand, would be subject to substantial access restrictions and associated negative impacts on their experiences. Maximum unguided use for both rivers would be reduced to 37 float starts per year. On the Kanektok River, that would mean the immediate displacement of 15 groups; on the Goodnews River, up to seven groups would be immediately displaced. Since limits would apply equally to both rivers, the Goodnews would not be available for displaced Kanektok users. By 2020, more than 40 would-be visitor groups could be denied access to these rivers each year. Since no changes are proposed for guided experience opportunities, this alternative would also have the effect of making guided experiences the predominant type on

these rivers. In addition to guided motorized activities, guided float starts would be allowed every other day or approximately 57 times per season, while only 37 unguided starts would be permitted.

The effects of proposed waste management actions would be the same as those described in the other action alternatives.

4.4.4 Effects on Local Users

Economic effects on local users are discussed in Section 4.4.5 Effects on the Local Economy.

Alternative A. Residents of Togiak Refuge-area communities could be impacted by changes in visitor use in much the same way that visitors are impacted. Increased visitor use could lead to increased crowding, competition, and general conflict for local users. Wolfe (1987, 1989) and Kluwe (2002) documented general types and specific incidents of conflicts between recreation visitors and local users on popular rivers in the Refuge area. Most conflicts occurred on the lower stretches of these rivers where guided motorized visitors and local users have been most likely to encounter one another. Some conflicts were rooted in opposing value systems (e.g., the ethics of catch-and-release fishing), while others were based on more tangible issues such as limited availability of camp or fishing sites or displacement of moose away from the river during hunting season, making them less available for subsistence hunters.

All other things being equal, increased visitor use would mean an increased likelihood of competition and conflict with local users. As with other kinds of impacts, the relationship between increasing use and increasing conflicts is probably not linear. In this case, however, it is possible that conflicts could increase at a faster rate than visitor use. General research in sociology and psychology has shown that the rate of aggressive behaviors and conflicts increases as more people vie for the same territory or resources (Malmberg 1980, Taylor 1988).

At present, local resident and visitor use of the Cape Peirce area is low, and no management actions have been proposed that would be likely to change the amount of use or affect local users in any other way. On the Kanektok River, unguided visitor float use would be expected to grow by 18 to 24 trip starts over the life of this plan (40 to 50 percent more use than is currently occurring). However, on the scale of total boat traffic along the lower river (where local user encounters would be most likely to occur), 24 new trips is a negligible increase. A nearly 50 percent increase in float visitor use could indirectly contribute to a few additional conflicts with locals who use the upper river, but this impact likely would be negligible overall.

Guided motorized use on the Kanektok, Goodnews, and Togiak rivers currently has occurred at or below permitted levels. If use on these rivers increased to near-maximum allowed levels, impacts to local users would increase. Refuge permit records from the last 15 years have shown short periods of increasing and then decreasing use, but the overall trend has been relatively flat. Accordingly, short term increases or decreases in negative impacts to local users could also occur, but the overall impact of current management would be expected to be negligible.

Increased use of the Kanektok and Goodnews rivers would result in increased disposal of human waste along the rivers. The requirement to bury waste 100 feet from surface waters in Alaska statute is intended to eliminate the effects of human waste entering the river. Assuming the increased users projected in this alternative appropriately and legally dispose of human waste as directed by statute, there likely would be minor negative to no effects on local users.

Alternative B. Under this alternative, unguided visitor use would be limited to one trip start every other day on the Kanektok River, and limited to current levels on the Goodnews River. These actions would have a negligible impact on local users. Guided motorized users on the Middle Fork Goodnews River would be allowed to continue one temporary camp, and maximum allowable use would increase from six to 10 people per day. Given historical use trends, it is unlikely that visitor use would approach these maximum allowable levels. If it does, however, this action would increase the likelihood of minor negative impacts to local users compared to current management.

Under this alternative, if water quality monitoring suggested that standards were at risk of being exceeded, all float groups would be required to carry out solid human waste. Depending on the total contribution of float groups to the exceeded standards, there likely would be a minor to moderate benefit to local users from this alternative.

Alternative C. This alternative would have impacts similar to those described under current management. Seasonally implemented, unguided visitor limits would have negligible effects on local users. Similarly, the proposed moderate reduction in allowable guided motorized use on the Goodnews River would likely have only minor or negligible effects on the actual number of guided users. Therefore, the effect on local users would be negligible or minor.

Seasonally implemented visitor limits could slow growth on the Kanektok and Goodnews rivers compared to current management, although growth could still occur without restriction outside of peak-use seasons. Therefore, the potential negative economic impact of use-limits would be partially mitigated. If the expected negative impacts under Alternative B would be minor to moderate, then impacts under this alternative would likely be negligible.

Impacts similar to what is described under Alternative B for dealing with solid human waste would be expected with this alternative.

Alternative D. Under this alternative, expanded commercial guiding opportunities would be provided on the Goodnews and Togiak rivers, and new guiding opportunities would be provided on the Osviak and Matogak rivers. On the Goodnews River, where demand has historically been below permitted levels, expanded opportunities probably would not lead to substantially increased visitor use. On the Togiak River, demand for guided visitor experiences has also been below permitted levels, but small changes there could lead to greater impacts on local users.

Commercial guiding opportunities on the Togiak River were carefully allocated according to available fishing sites in the 1991 Togiak Refuge Public Use Management Plan (PUMP). Roughly doubling the allowable guided use, as proposed in this alternative, could reduce the number of fishing sites available at any one time from nine to two or three. During seasonal periods of peak demand, local users and guided visitors would compete for available sites, and some conflicts likely would occur. Based on the level of interest in Togiak River allocation that was expressed during development of the 1991 PUMP and again during scoping for this PUMP revision, it would also be likely that some local users would be further impacted by the perceived loss of access protections for which they have argued. Estimating the magnitude of these impacts is difficult due to the many interacting factors involved (e.g., individual behaviors and tolerances, seasonal fish returns and water levels, trip logistics, travel patterns). It would be reasonable to expect, however, that a large proportion of local users could be negatively impacted by the proposed action, either directly as the result of competition and conflict or indirectly as the result of perceived inequities or lost opportunities. If more than half of local users were affected in one of these ways, the proposed action would have a major negative

impact.

There is currently very little, if any, visitor use on the Osviak and Matogak rivers, so any new guided visitors would be conspicuous. In addition, there are several private parcels and cabins located on the lower stretches of these rivers where local users and visitors would be likely to encounter one another. Providing new guiding opportunities on the Osviak and Matogak rivers would likely lead to conflicts with a few local users, but visitor demand on these rivers is expected to be very low (at present it is not clear that there is any commercial interest in guiding on these rivers), so overall impacts would likely be negligible.

Under this alternative, impacts similar to what are described under Alternative A could be expected. This would assume an increase in use, but adherence to state statutes that require burial of human waste no less than 100 feet from surface waters.

Alternative E. Under this alternative, unguided use on the Kanektok and Goodnews rivers would be limited to one float start every three days. Since this reduction would have little impact on the total volume of lower-river boat traffic (where recreational visitors are most likely to encounter local users), the positive effects (in the form of reduced conflicts) of this action would be negligible. Management of guided use would be the same as current management, so the effects on local users would be the same as well.

Less visitation would result in less disposal of human waste in the river corridors. Assuming, however, that disposal under all alternatives is done in compliance with statute, the reduced use under this alternative may not result in noticeably lower impacts on the rivers from human waste disposal. It is likely that this alternative would result in a neutral to minor positive impact on local users.

4.4.5 Effects on the Local Economy

Alternative A. Refuge public use management affects the economy through direct spending and through various actions that may influence the number of visitors who travel and spend money in the region. Direct spending includes employee salaries, gas, and equipment, and may also include the purchase of special goods and services such as contracted facility construction and maintenance. The primary outlets for visitor spending include air taxis, lodging, guide and outfitter fees, food, and miscellaneous small equipment such as fishing gear.

No changes in direct Refuge spending that would affect the local economy have been planned under current management. Guide and air taxi fees associated with hunting and wildlife viewing would continue to be important sources of revenue for a few individuals, but most economic impacts would be associated with recreational fishing.

The vast majority of recreational visits to Togiak Refuge have been associated with fishing. According to reports from permitted guides and air taxi operators, there were a total of 90 wildlife viewing use-days at Cape Peirce in 2003. In comparison, there have been between 8,000 and 10,000 recreational fishing use-days on the Refuge each year since the mid 1990s (See Figure 3-10, Togiak Refuge Recreational Fishing 1990-2004 in the Plan). Goldsmith, et al. (1998) estimate that the economic significance of recreational fishing on the Refuge (the impact of spending after it has circulated in the economy) was about \$3,570,000 in statewide household income in 1997. Based on these figures, an average recreational fishing day is worth (very roughly) \$357 in the Alaska economy.

Under current management, guided use of the Kanektok, Goodnews, and Togiak rivers would be expected to continue at roughly the same level as in recent years. Unguided use on the Kanektok would likely increase by 18 to 24 trips within 15 years. According to 2001 visitor survey results (Appendix E), average trip length for unguided float groups has been eight days, and average group size had been four, so the projected increase would result in 576 to 768 use-days. At \$357 per use-day, increased use could be worth as much as \$274,176 in annual household income (in 1997 dollars) by 2020. While additional visitor spending would clearly have a positive economic impact, the effect would be small on the scale of total recreational fishing impacts; the maximum expected increase would represent less than eight percent of the total income currently generated by fishing. It would be likely that positive impacts would be limited to the community level; therefore, current management would have a minor to moderate positive effect on the economy, affecting jobs and income within the community.

Alternative B. Under this alternative, growth in unguided use of the Kanektok and Goodnews rivers would essentially be prevented. There would be few short-term differences, but over time, less household income would be generated from Kanektok River visitors compared to current management. If group size, trip lengths, and demand on other rivers stayed the same, the difference by 2020 could be as much as \$217,000 annually (in 1997 dollars), or close to seven percent of total statewide household income currently generated by Togiak Refuge recreational fishing⁸. The loss of this potential income would constitute a minor to moderate negative impact on the economy. The effects of Cape Peirce management and guided river-use management would be essentially the same as those described under Alternative A.

Alternative C. Under this alternative, maximum allowable use at Cape Peirce would double compared to current management. Visitor demand at that location would vary according to the unpredictable presence of walrus, but if demand were consistently high, actual visitor use could more than double compared to recent years. However, since the economic significance of non-consumptive refuge activities has been relatively small—estimated at \$300,000 (Goldsmith, et al. 1998) in 1997—the positive impacts of increased use would likely be minor. Seasonally implemented visitor limits could slow growth on the Kanektok and Goodnews rivers compared to current management. However, the proposed Goodnews River limits would allow for substantial growth compared to current use; some displaced Kanektok visitors could, and likely would, switch to the Goodnews River because it offers similar fishing and floating opportunities. Therefore, the potential negative economic impact of use-limits would be partially mitigated. The impacts under this alternative would likely be negligible.

Alternative D. Under this alternative, the minor positive economic impacts of increased use at Cape Peirce would be the same as those described under Alternative C. The effects of increased, unguided visitor use would be the same as those described under current management. The effects of increased commercial guiding opportunities would largely depend on visitor demand. Since most guided visitor use has long been below permitted levels, there would be little evidence to suggest that increasing guided opportunities would lead to more guided visitors. This alternative would present the potential for substantially increased visitor use and associated positive economic impacts; however, it is likely that actual impacts would be negligible.

⁸ The difference between maximum projected use under current management (76 Kanektok River unguided float trips) and maximum allowable use under Alternative B (57 starts) is 19. Nineteen, four-person trips of eight days each is equivalent to 608 use-days or \$217,056 in statewide household income (using 1997 estimates).

Alternative E. Under this alternative, the minor positive economic impacts of increased use at Cape Peirce would be the same as those described under Alternative C. Construction of a cabin could motivate a small, short-term increase in Refuge spending but the effect would be negligible. Unguided use of the Kanektok and Goodnews rivers would be limited to one trip every three days. On the Kanektok, limiting trip starts in this manner would reduce use by at least 15 trips immediately and up to 39 trips by 2020 (given maximum projected demand). On the Goodnews, use would be reduced by up to seven trips immediately and some slightly larger number by 2020 (given relatively flat demand). If future unguided use on these two rivers was reduced by a total of 45 trips compared to current management, the economic effect would be (roughly) a \$514,000 reduction in statewide income or about 14 percent of total statewide household income currently generated by Togiak Refuge recreational fishing.⁹ If the expected negative impacts under Alternative B were minor to moderate, projected long-term impacts under this alternative likely would be moderate to major (affecting some jobs and income in multiple communities). No changes were proposed for guided fishing opportunities, so the effects would be the same as those described under current management.

4.4.6 Effects on Wilderness Values

The wilderness values considered in this section were derived from the 1964 Wilderness Act and described in chapter 3, section 3.6.1 of the Plan. The values are: *undeveloped, untrammeled, natural, outstanding opportunities for solitude, and outstanding opportunities for a primitive or unconfined type of recreation*. For the purposes of this analysis, only values that may be influenced by refuge management are considered.

In the context of refuge management, the *undeveloped* and *natural* values may be affected by the presence of structures such as cabins and outhouses, and by other evidence of people such as litter, human waste, and campsite impacts including trampled vegetation and fire rings. Opportunities for solitude and primitive recreation may be affected by the presence of other users, by developments that reduce challenge or self-reliance (e.g., signage, bridges), and by regulations that limit perceived freedom. Most of these factors, including crowding and solitude, perceived freedom, litter, and human waste were discussed in the preceding visitor experiences section. Where appropriate, that section is referenced rather than repeating the information here.

Alternative A. Under current management, Cape Peirce likely would remain an undeveloped, highly natural setting with excellent opportunities for primitive recreation and solitude. Visitation would be limited to one flight and six people per day, and all visitors would be required to obtain a Refuge permit. This limitation virtually would assure each visiting group that they would experience a high degree of solitude. The permit requirement might be perceived as a constraint by some, but at current and expected use levels, it has not enforced and has not functionally limited use. Therefore, its negative effects on perceived freedom would now, and continue to be, negligible.

On Kagati Lake (put in for the Kanektok River) and Goodnews lakes, outhouses would continue to have a minor, localized impact on settings that are otherwise undeveloped and

⁹Forty-five trips is equivalent to 1,440 use-days; multiplied by \$357 per use-day, the total is \$514,080.

highly natural. River visitors who began their trips at these lakes would be more likely to encounter other visitors as use increased over time. Increased use would have a moderate to major impact on opportunities for solitude through increased competition, crowding, and conflicts as described in the preceding visitor experiences section. Litter and human waste from additional visitor use might also have a minor impact on natural conditions.

On the Togiak River, both guided and unguided visitation would be expected to continue at present levels and no change in current wilderness values would be expected.

Alternative B. Under this alternative, impacts to wilderness values at Cape Peirce would be the same as those described under current management. At Kagati and Goodnews lakes, outhouses could be removed if river floaters are eventually required to carry out all waste. Removing the outhouses would have a moderate positive impact on naturalness, but regulating visitor behaviors could also have a negative impact on the experience of wilderness freedom. The magnitude of this impact would be major in the sense that it would affect all float visitors, but the nature of the impact (its actual influence on perceived freedom) would be highly variable depending on individual visitor perceptions.

Float groups under this alternative would be much less likely to encounter one another, as both guided and unguided visitors would be limited to one trip each on alternating days. Over time, opportunities for solitude—especially on the Kanektok River—would be enhanced compared to current management; the preceding section on visitor experiences describes projected levels of use and associated impacts. On the Togiak River, both guided and unguided visitation would be expected to continue at present levels and no change in current wilderness values would be expected.

Alternative C. Under this alternative, maximum public use at Cape Peirce would be doubled from one to two flights per day, and tent platforms, an outhouse, and a food storage area would be constructed at Sangor Lake. Construction of the facilities would have a moderate, localized negative impact on the natural setting. Doubling allowable use would not immediately impact opportunities for solitude, given current visitor demand. Under conditions of high demand, however, this increase could have at least a moderate negative impact (affecting up to half of visitors) on opportunities for solitude, as visiting groups would be much more likely to encounter one another.

It is doubtful that outhouses at Kagati and Goodnews lakes could be removed under this alternative, because packing out human waste would be voluntary. Research has shown that river users almost never voluntarily comply with waste pack-out programs (Whittaker 2005). At the same time, a voluntary program would have no impact on visitor experiences of freedom.

During peak fishing seasons on the Kanektok and Goodnews rivers, impacts on solitude and naturalness would be reduced compared to current management as a result of the proposed limited permit program. Outside of the peak seasons, unguided use could and likely would increase moderately compared to current levels, with associated negative impacts on solitude and naturalness. See the preceding section on visitor experiences for specific estimates of projected future use and impacts.

A small reduction in the permitted amount of guided, motorized use on the North Fork Goodnews River could have a positive impact on opportunities for solitude there. However, since current use is low and demand also appears to be low, the magnitude of that impact would

be negligible. On the Togiak River, where no management changes are proposed, both guided and unguided visitation would be expected to continue at present levels, and no change in current wilderness values would be expected.

Alternative D. Under this alternative, impacts to wilderness values at Cape Peirce would be largely the same as those described under Alternative C. Facilities at Sangor Lake would be upgraded to include a cabin as well as tent platforms, an outhouse, and a food storage area, but the impacts to the undeveloped, natural setting would still be moderate and localized.

The effects of the proposed waste management program would be the same as those described under Alternative B. Unguided use on the Kanektok and Goodnews rivers would be allowed to expand according to demand, with associated impacts to naturalness and solitude as described in previous sections. Guided, motorized and float use would be allowed to expand on the Goodnews and Togiak rivers, although demand for these opportunities is uncertain. Projected future use levels and associated impacts to primitive recreation and solitude are described in the preceding sections on visitor experiences and local users.

Alternative E. Visitor use and facilities at Cape Peirce would be largely the same as those described under Alternative D, although a large cabin with a meeting area would also be provided. Impacts to naturalness and opportunities for primitive recreation would be greater under this alternative than under any of the others. However, with proper attention to the design and specific location of the facilities, impacts would still be localized and moderate.

At Kagati and Goodnews lakes, outhouses could be removed when river floaters are eventually required to carry out all waste. Removing the outhouses would have the same effects, both positive and negative, as those described under Alternative B. Solitude for float visitors beginning their trips at these lakes and for other Kanektok and Goodnews River visitors would be maximized under this alternative. Projected future use levels and associated impacts are described in the preceding section on visitor experiences. On the Togiak River, where no management changes are proposed, both guided and unguided visitation would be expected to continue at present levels and no change in current wilderness values would be expected.

4.4.7 Cumulative Effects

Alternative A. Estimates of environmental effects under this alternative are based largely on current and projected future visitor-use levels. The accuracy of those projections depends on a host of factors that are not under the direct control or influence of refuge management. For example, the availability of other recreational fishing opportunities within southwest Alaska might influence Refuge visitation. At nearby Wood-Tikchik State Park, where wilderness fishing is also a popular attraction, visitor access has recently been limited in accordance with the 2002 Park plan (Alaska Department of Natural Resources 2002). Use limits implemented in the Park could, over time, effectively increase demand for Togiak Refuge fishing. However, given that the total number of visitors displaced from the state park is likely to be small and that opportunities in the Refuge might not be directly substitutable for those in the park, the magnitude of this impact likely would be negligible.

Long-term weather, wildlife, and fishery trends could also impact refuge visitation, but of all the many potential outside factors, those affecting the cost and various challenges of air travel would be the most likely to have a measurable impact. The vast majority of Refuge visitors arrive by air, many from distant parts of the United States or foreign countries. Air travel is strongly influenced by security concerns, flight and route availability, and fuel and other

operating costs. The worldwide downturn in air travel and tourism arrivals following the September 11, 2001 terrorist attacks in New York City is well-documented (Travel Industry Association of America 2005). Conversely, studies have shown that the addition of a single new commercial air route—such as the direct flight from Frankfurt, Germany to Anchorage seasonally operated by Condor Airlines—can measurably increase Alaska visitation (Alaska Department of Commerce, Community, and Economic Development 2004).

It is reasonable to expect that improvements in air travel (i.e., reductions in cost, new technologies that reduce time or improve convenience, etc.) might encourage more Refuge visitation, while increased cost (due to rising fuel prices for example) or other negative changes might mitigate projected increases in visitation. It is not known, and at best uncertain, how or if such changes in air travel would affect travel patterns in rural Alaska or visitation to the Togiak refuge.

Overall, the actions under current management, combined with other foreseeable influences, would allow for continued increases in unguided visitor use on popular Refuge rivers. The projected use increases would have moderate to major negative impacts on Kanektok River visitor experiences, negligible or minor negative impacts on local users, moderate positive impacts on the local economy, and moderate negative impacts on wilderness values.

Alternative B. Under this alternative, the effects of various factors outside direct control of the Refuge would be the same as those described under current management. Overall, the actions under this alternative, combined with other foreseeable influences, would essentially eliminate increases in unguided visitor use on the Kanektok and Goodnews rivers. The proposed actions would protect most aspects of visitor experiences and wilderness values, with moderate negative impacts to visitor access and freedom. Over time, local users could benefit slightly from reduced competition and conflicts, while the local economy would be negatively impacted from lost visitor spending.

Alternative C. Under this alternative, the effects of various factors outside direct control of the Refuge would be the same as those described under current management. Overall, the actions under this alternative, combined with other foreseeable influences, would allow unguided visitor use outside the peak fishing seasons to increase at a moderate rate while limiting peak fishing season use to current levels or lower. These actions would have impacts similar to those described under Alternative B, but they would be smaller in magnitude. Positive impacts to visitor experiences, wilderness values, and local users would occur primarily during peak seasons; negative impacts associated with access restrictions would also be limited to those time periods.

Alternative D. Under this alternative, the effects of various factors outside direct control of the Refuge would be the same as those described under current management. Overall, the actions under this alternative, combined with other foreseeable influences, would also be similar to those described under current management. However, expanded commercial use, particularly on the Togiak River, could have additional moderate to major negative impacts on local users although it may have positive economic impacts.

Alternative E. Under this alternative, the effects of various factors outside direct control of the Refuge would be the same as those described under current management. Overall, the actions under this alternative, combined with other foreseeable influences, would reduce unguided visitor use on the Kanektok and Goodnews rivers by about 30 percent immediately and by more than 50 percent by 2020. The proposed actions would enhance most aspects of visitor experiences and wilderness values, with associated moderate to major negative impacts to visitor access and freedom. Over time, local users would also benefit from reduced competition and conflicts, while the local economy would be moderately impacted from lost visitor spending.

4.5 Short-Term Uses of the Environment and Long-Term Productivity

Under all alternatives, the primary short-term uses of the Refuges would be subsistence and recreation. Monitoring and regulation of harvested fish and wildlife populations by ADF&G and the Service would ensure the long-term productivity of fish and wildlife populations. None of the short-term uses described in the alternatives would affect the long-term productivity of the ecosystem.

4.6 Irreversible and Irretrievable Commitment of Resources

The irreversible commitment of resources means that nonrenewable resources are consumed or destroyed. Examples include the destruction of cultural resources by other management activities and mineral extraction that consumes nonrenewable minerals.

The irretrievable commitment of resources represents trade-offs (opportunities forgone) in the use and management of natural resources. Irretrievable commitment of resources can include the expenditure of funds, loss of production, or restrictions on resource use.

Wilderness and river-related values are protected by the management may be irreversibly lost or under Alternatives A and D where public use is allowed to increase. Limits on unguided use in the Kanektok and Goodnews watersheds would be an irretrievable commitment of resources as the opportunity to engage in those activities would be restricted. Although alternatives presented in this plan allow for increases in the amount of guided use allowed on the Goodnews and Togiak rivers, no alternative reduces the amount of guided use allowed at this time. Therefore, no irretrievable commitment of resources is proposed in this plan.

4.7 Environmental Justice

Federal agencies are 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, 1994; amended 1995). This includes health risks and other impacts for people who rely principally on fish or wildlife for subsistence. As described in chapter 3 of the Comprehensive Conservation Plan, communities associated with the Refuge are rural, contain many low-income households, and engage in subsistence uses. The nature of the proposed action, revision of the Public Use Management Plan for the Refuge, is very different from proposals often associated with environmental justice issues (e.g., siting of polluting facilities). None of the alternatives

proposed in the Environmental Assessment would place a disproportionate weight of any adverse effects on low-income or minority populations. Maintaining high-quality habitat and healthy populations of fish and wildlife, maintaining water quality, and providing opportunities for subsistence are legislated purposes of the Refuge. Thus, 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 would favor activities or projects that could direct negative impacts toward low-income or minority populations.

4.11 References Cited

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5. Evaluation of the Alternatives

5.1 Evaluation Criteria

The purpose of this plan revision is to guide management of public use on the Togiak NWR in accordance with the general management direction set forth for each unit in the 1991 Public Use Management Plan and its amendments; to support the refuge vision and goals stated in the revised Comprehensive Conservation Plan; and the purposes of the refuge while also allowing the public to experience the refuge with its unique resources. Within the designated Togiak Wilderness Area, management of public use should balance the opportunity for recreation with the values of solitude and a primitive and unconfined type of recreation. The alternatives are evaluated against five criteria based on the Purpose for this plan revision and Need for Action stated in Chapter 1 and existing policy and law. These criteria were selected as being the most important factors to be used in selecting the preferred alternative. Following are these criteria:

1. How well does the alternative satisfy the purposes of the Togiak Refuge, including the purpose to manage Togiak Wilderness Area as a unit of the National Wilderness Preservation System, and other provisions of the Alaska National Interest Lands Conservation Act (ANILCA)?
2. How well does the alternative satisfy the mission of the National Wildlife Refuge System?
3. How well does the Alternative contribute to meeting the Public Use Goal of the Refuge?
4. How does the alternative address the issues identified?
5. How well does the alternative maintain biological integrity, diversity, and environmental health at the Refuges- and ecosystem-scale and contribute to managing the Refuges as part of an ecosystem?

Chapter 4 of the Public Use Management Plan (PUMP) describes the physical, biological, and socioeconomic impacts of each of the alternatives and provides a summary of the projected changes.

5.2 Criteria 1. Response to Refuge Purposes

While some plan alternatives will be more effective than others, all alternatives will:

- i) conserve fish, wildlife, plants, and their habitats in their natural diversity
 - ii) fulfill the international treaty obligations of the United States with respect to fish, wildlife, plants, and their habitats
 - iii) provide, in a manner consistent with (i) and (ii), the opportunity for continued subsistence uses by local residents
 - iv) provide, in a manner consistent with (i) and (ii), a program of national and international scientific research on marine resources of the Hagemeister Island portion of Alaska Maritime Refuge
 - v) ensure, to the maximum extent practicable and in a manner consistent with (i), water quality and necessary water quantity within the Refuge
- [Togiak Wilderness Area] secure an enduring resource of wilderness, to protect and

preserve the wilderness character of the area and to administer this wilderness for the use and enjoyment of the American people in a way that will leave it unimpaired for future use and enjoyment as wilderness

Alternative E provides the highest level of protection for Refuge resources. The apparent naturalness of the Togiak Wilderness Area would be improved with the removal of existing permanent structures (outhouses). Reduced recreational use under Alternative E would provide the greatest amount of wilderness solitude.

Alternative B would provide slightly less protection than Alternative E, followed by Alternatives C (the preferred alternative), A (no action), and Alternative D (which, when compared with the other four alternatives, responds least to Togiak Refuge purposes).

Alternatives A (no action) and D provide the least amount of protection of wilderness values through increased visitation in the Togiak Wilderness. Alternatives B and C (the preferred alternative) will allow some additional competition from recreational users; therefore, subsistence opportunities under these alternatives will fall between Alternative E, and Alternatives A (no action) or D.

5.3 Criteria 2. Response to National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

All alternatives were developed with the Refuge System Mission in mind, and all contribute to fulfilling that mission. The Refuge play a part in supporting migratory birds, salmon, waterfowl, shorebirds, and marine mammals that migrate far from the Refuge and even from the state. Many other species (e.g., brown bears, caribou, and moose) use the Refuges for part of the year and migrate to other areas seasonally.

5.4 Criteria 3. Response to Refuge Public Use Goal

Management goals were established for Togiak Refuge in the Comprehensive Conservation Plan. The public use goal is to provide quality fish and wildlife oriented recreation, subsistence, interpretive, and educational opportunities that promote stewardship of southwest Alaska wildlife and their habitats.

All of the alternatives fulfill the Refuge's public use goal, although Alternative C, the preferred alternative, provides the broadest balance of opportunities within that goal. Alternative C promotes quality recreation experience and subsistence opportunities by managing the levels of public use, both commercially guided and unguided on rivers in the Refuge. Interpretive and educational opportunities and promoting stewardship are addressed through actions at both Cape Peirce and on the major rivers, particularly waste management. Alternatives A and D allow levels of public use which may reduce the quality of both the recreational experience and subsistence opportunities and lessen the atmosphere of stewardship of the wilderness resources. Alternatives B and E would provide high quality recreational experience and subsistence opportunity, but would reduce the opportunity for public recreation on the major rivers.

5.5 Criteria 4. Response to Issues

5.5.1 *Public Use at Cape Peirce Wildlife Viewing Area and Public Facilities at Sangor Lake*

The Need for Action includes: To establish management emphasis, level of visitation, a permit allocation method, and appropriate types of facilities for the Cape Peirce Wildlife Viewing Area.

All alternatives will maintain a low-disturbance environment to protect sensitive wildlife species. Alternatives C (the preferred alternative), D, and E will provide increased wildlife-viewing opportunities. Alternatives A (no action) and B will maintain existing wildlife-viewing opportunities. Alternatives A (no action), B, and E will provide the greatest amount of visitor safety and comfort through facilities development. Alternatives A (no action) and D will not provide an equitable allocation between air-taxi operators and wildlife-viewing guides for future visitation to the area as access continues on a first-come, first-served basis.

5.5.2 *Unguided Recreational Opportunities in the Kanektok and Goodnews River Watersheds*

The Need for Action includes: To establish levels and a strategy for achieving levels of unguided recreational visitation on the Kanektok and Goodnews Rivers within the Refuge which will maintain the wilderness attributes of solitude, naturalness, and the opportunity for a primitive and unconfined recreation experience.

Alternative E provides the most opportunities for wilderness solitude but will also provide the fewest number of recreational opportunities. Alternative A (no action) and D both provide for unlimited additional recreational opportunities but will provide the fewest opportunities for wilderness solitude through increased visitation and commercial motorized use within the Togiak Wilderness Area. Alternatives B and C (the preferred alternative) will maintain current wilderness conditions and opportunities for wilderness solitude but will slightly reduce the potential for added recreational opportunities in the future. Current recreational opportunities would be maintained as part of Alternatives B and C (the preferred alternative).

5.5.3 *Waste Management*

The Need for Action includes: To identify and choose an approach to managing the disposal of solid human waste along high use rivers on Togiak Refuge.

Alternative E will immediately reduce, through direct management actions, impacts related to improper disposal of human waste and will best address this issue over the short and long term. Alternative C (the preferred alternative) will work toward a voluntary pack-out program which may avoid additional regulations and improve conditions within the Togiak Refuge in the long-term. Alternatives B and D will also address the issue over the long term through increased monitoring and established standards but will only implement increased visitor education and outreach in the short term. Alternative A (no action) is least effective in responding to this issue through increased visitor education and outreach.

5.5.4 Commercial Recreational Fishing in the Goodnews, Togiak, Osviak, and Matogak River Watersheds

The Need for Action includes: To evaluate and identify additional opportunities for commercial guiding of recreational fishing on the Goodnews, Osviak, Matogak, and Togiak rivers in cases where there is a demonstrated interest by commercial operators. Opportunities should be balanced with consideration of resource impacts, private land considerations, and conflicts with other users, and minimizes conflicts with local residents.

Alternative D provides the greatest number of commercially guided recreational fishing opportunities through additional special use permits for the Goodnews, Togiak, Osviak, and Matogak river watersheds. It also has the greatest potential for conflicts with local subsistence users and land owners. Alternatives A (no action) and E provide no additional opportunities, but result in fewer conflicts with local subsistence users and land owners along the Togiak, Osviak and Matogak rivers. Alternative B provides only a few more opportunities than does Alternative A (no action) and has less potential for conflicts. Alternative C (the preferred alternative) provides a moderate number of additional commercial recreational fishing opportunities on the Goodnews River, and also minimizes the potential for conflicts with locals on the Osviak and Matogak rivers.

5.6 Criteria 5. Biological Integrity and Ecosystem Management

The Service policy on maintaining the biological integrity, diversity, and environmental health of the National Wildlife Refuge System provides refuge managers with direction to follow while achieving refuge purposes. The policy also provides an evaluation process to analyze refuges and, through the planning and compatibility processes, to set appropriate management direction to maintain and, where appropriate, restore biological integrity, diversity, and environmental health. Ecosystem management is more a way of thinking than an end product. It embodies the concepts of a constantly changing landscape where humans play a part, influence the ecosystem, and have a role in decisions affecting the land. To understand the effects of an action, the manager must look at it from scales both larger and smaller than the refuge. Ecosystem management requires the manager to look at the long-term effects of actions and to think in terms of years and decades.

Each of the alternatives provides management direction that maintains the biotic and abiotic conditions on the Refuge within historic ranges. All alternatives maintain the biological integrity, diversity, and environmental health of the Refuge and integrate scientific knowledge into the management of the Refuge. Natural processes are the dominant force at work within the Refuge.

Human activities are predominantly related to hunting and fishing and are managed by state regulations and Federal Subsistence regulations.

Ecosystem goals for the ecoregions encompassing the Refuge have not been developed. When they are developed, it will be possible to display the role the Refuge play in contributing to meeting those ecosystems goals.

5.7 Conclusion

The differences among the alternatives are relatively small. Each action alternative varies slightly from the current management direction; therefore, differences in meeting the evaluation criteria are slight. Alternatives that would clearly not meet the purposes of the Refuges or System mission were not developed.

Based on the evaluation criteria, Alternative C best meets the purpose of this plan revision and the needs for action.

6. Implementation and Monitoring of the Public Use Plan

The Togiak Public Use Management Plan will be implemented through various step-down plans. Each of these plans has its own focus and revision schedule. Certain actions would require the promulgation of regulations to implement. Part of the implementation process is the Refuges involvement with partners.

Monitoring the outcome of implementation is effected by surveys, inventories, censuses, etc., and may lead to amendment or revision of the Plan.

6.1 Key Step-Down Plans

Step-down management plans deal with specific management subjects. They describe management strategies and implementation schedules. Step-down plans important for the implementation of the Public Use Management Plan include:

6.1.1 *Cultural Resource Management Plan*

This step-down plan provides guidance to Refuge staff in meeting legal requirements to protect and manage the cultural resources of the Refuge. The cultural resources plan provides a ready reference to the cultural resource guidance provided by law and regulation, by the Service Manual, and by the Cultural Resource Management Handbook. It outlines roles and responsibilities, summarizes legislation governing management of cultural resources, and contains information of use to the Refuge Manager. It describes the current state of our knowledge of the prehistory and history of the region. It includes a list of projects that would fill in gaps in knowledge or would complete existing work. A cultural resource plan for the Refuge is scheduled for completion in 2010. Cultural Resources may be at risk of damage from public use activities and management. Areas around Kagati, Goodnews, and Togiak lakes, Cape Peirce, and all major river drainages include cultural resources which are eligible for inclusion on the National Register of Historic Places. Additional assessment of these resources is needed.

6.1.2 *Public Use Monitoring Plan*

Due to the complex nature of public uses within the Refuge, a detailed system for measuring change over time is needed to evaluate the effectiveness of actions taken as outlined in this Public Use Management Plan revision. To accomplish this task, the Refuge will work with cooperators to develop a monitoring plan which will include guidelines for monitoring public use in the future. This plan will be developed through an open process involving both the public and the State of Alaska. Through this step-down plan, the Service will select important indicators of public use, resources, and wilderness experiences. The plan will establish acceptable standards for these indicators, techniques to measure them and management actions to be taken should these standards be threatened or exceeded. This step down plan is scheduled for completion within 5 years of the adoption of this Public Use Management Plan revision.

6.1.3 *Wilderness Stewardship Plan*

This step-down management plan provides detailed strategies and implementation schedules for meeting wilderness goals and objectives identified in the Comprehensive Conservation Plan and the more specific actions addressed in this plan.

6.1.4 *Water Quality Monitoring*

Protocols and a regular program of water quality monitoring will be developed for key water bodies within the refuge. The goals of this program are to document water quality, to monitor changes and to alert management to the need for corrective action within the jurisdiction of the Service, in order to maintain quality within Clean Water Act standards.

6.2 Promulgation of Regulations

Several of the actions considered in this plan, including those that would require permits for the public (excluding commercial operators), will require the promulgation of regulations to be implemented. The Service will follow guidance provided in ANILCA and other laws and policies in the promulgation of regulations.

6.3 Partnership Opportunities

Partnerships with other organizations are among the ways in which the Service fulfills its mission, “Working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.”

The Refuge exists within a dynamic ecosystem. Fish, wildlife, and other resources do not respect artificial boundaries, and many of the resources within the Refuge are of national and international importance. The Service recognizes that the public, organizations, and other government agencies have interests in the Refuge. Implementation of many refuge programs requires community involvement and assistance.

- The Refuge looks for opportunities to coordinate activities with the following, among others:
- Bristol Bay and Calista Regional Native corporations
- Bristol Bay Native Association and the Association of Village Council Presidents
- Bristol Bay Economic Development Corporation and Coastal Zone Regional Fund
- Local village corporations
- Local village councils
- State of Alaska
- U.S. Geological Survey, Bureau of Land Management and other federal agencies
- Universities
- Nongovernmental organizations
- Dillingham, Lower Kuskokwim and Southwest school districts

Examples of existing, past, and potential partnerships include the following.

In 2009 the refuge signed an MOU with the Wood-Tikchik State Park. The MOU establishes a general framework for cooperation and exchange of information and services between the refuge and the park on matters of mutual interest.

The refuge has partnered in the past with the Goodnews Bay and Kwinhagak Traditional Councils to conduct river ranger duties on the Goodnews and Kanektok rivers. These partnerships have ranged from cooperation to joint patrols on both the refuge and corporation lands on the lower Goodnews and Kanektok rivers.

The refuge law enforcement staff regularly works with the Alaska State Troopers, Wildlife Enforcement Division in both Dillingham and Bethel to investigate and enforce fish and wildlife related violations that occur on the refuge.

The Natural Resources Department of the Bristol Bay Native Association works with the Refuge in accomplishing many mutual objectives. Summer interns employed by BBNA provide valuable assistance on Refuge projects each year. A traditional and ecological knowledge project undertaken by the Refuge, with funding provided by the Office of Subsistence Management (OSM) has received broad support from BBNA, including funding and staff time to complete the project. A partnership with BBNA to complete OSM funded subsistence projects has been undertaken in the past and continues to be a component of any project for which the Refuge shares mutual objectives of information collection.

The Refuge regularly employs summer interns from the Bristol Bay Economic Development Corporation and the Bristol Bay Native Association as part of the public use and biological programs. Others are hired as seasonal refuge employees utilizing BBEDCs extensive recruitment program which includes visits to Alaska's universities. The refuge also provides a work site for students participating in the Alaska Native Science and Engineering Program (ANSEP). All of these programs improve the refuge's ability to interest local residents in resource management careers in the region.

The Togiak Refuge serves as the setting for several universities conducting studies on climate change. The refuge has partnered with the Universities of Colorado, Northern Arizona, Mt. Holyoke, Alaska, and Northern Illinois University to conduct analysis and long-term climate studies to help assess how flora and fauna may have changed over time in the region.

Education and outreach continues to be a central component essential to successful management of the Refuge. Partnerships with Southwest Regional Schools, Dillingham School District, the Lower Kuskokwim School District, and all of the affected communities allow this to be successful. Some of the elements of this partnership include the Bristol Bay Salmon Camp, Cape Peirce Marine Science and Yup'ik Culture Camp, and the Ecology and Outdoor Skills Camp held each summer. Other current and former partners on the Bristol Bay Salmon Camp include the Alaska Department of Fish & Game, Alaska State Parks, BBEDC, BBNA, Bristol Bay Science and Research Institute, University of Washington, Fisheries Research Institute, and University of Alaska Fairbanks. Classroom visits by refuge staff are made periodically during the school year to conduct environmental education programs, generate interest for the science camps, provide migratory bird calendar content information, and other purposes.

The Refuge produces a weekly radio program in cooperation with public radio station KDLG in Dillingham. Bristol Bay Field Notes is aired three times weekly throughout much of southwest Alaska. The program has been among the three most popular programs aired by KDLG each year since its inception in 2000.

The common occurrence of moose on many parts of the Refuge is a fairly recent phenomenon. Refuge staff work in partnership with ADF&G and the villages of Togiak, Twin Hills, Manakotak, and Dillingham through the Unit 17A Moose Management Working Group to monitor the status of the moose herd in that unit and develop management strategies. Work continues with the villages of Goodnews Bay, Platinum, and Quinhagak to develop management goals for expanding moose herds in drainages most used by those villages.

6.4 Public Use Plan Amendment and Revision

Periodic review and revision of this Plan will be necessary. As knowledge of Refuge resources and users improves, changes in management directions may be identified. Fish and wildlife populations, user groups, adjacent land users, and other management considerations change with time, often in unforeseen ways. Obstacles also may be encountered in implementing the Plan.

Revisions are a necessary part of the adaptive management approach used by the Refuge. This means that objectives and strategies to reach goals can be adjusted.

The Refuge will periodically hold meetings—or use other techniques such as comment cards and surveys—to solicit comments for evaluation purposes and to enable Refuge users, adjacent landowners, local, state and federal agencies, and other interested parties to express their views on how public use on the Refuge is being managed. By encouraging continuing public input, the Refuge is better able to serve the public, to determine potential problems before they occur, and to take immediate action to resolve existing problems.

Every three to five years, Refuge staff will review the plan, public comments, local and state government recommendations, staff recommendations, research studies, and other sources to determine if revisions to the Plan are necessary. If major changes are proposed, the public will be given the opportunity for involvement.

Appendix A
Togiak National Wildlife Refuge and Lower Goodnews River
Special Use Area

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF THE COMMISSIONER

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The Commissioner of the Department of Natural Resources hereby adopts the guidelines in Appendix C (pages C-9 through C-14) of the Revised Togiak National Wildlife Refuge Comprehensive Conservation Plan and Public Use Management Plan Environmental Assessment for state-owned shorelands in the Togiak National Wildlife Refuge and lower Goodnews River as a state land use plan under AS 38.04.065 and 11 AAC 55.010-.030. The Department of Natural Resources will manage state-owned shorelands within the Togiak National Wildlife Refuge and lower Goodnews River consistent with the guidelines identified in the revised plan and listed on the following three pages.

Those state-owned shorelands within the Togiak National Wildlife Refuge and lower Goodnews River were designated as Special Use Lands at 11 AAC 96.014(b)(8) in 2002. The Commissioner finds that this designation remains consistent with the Department of Natural Resources' management authority and that this action continues to be in the best interest of the state.

This action rescinds the previous Special Use Lands Designation for this area, signed May 10, 1991.



 Tom Irwin, Commissioner
 Department of Natural Resources

April 14, 2008

 Date

MANAGEMENT OF STATE SHORELANDS AND WATERS WITHIN THE
TOGIK NATIONAL WILDLIFE REFUGE AND LOWER GOODNEWS RIVER
ADL 226851

The Alaska Department of Natural Resources has been engaged in a cooperative planning process with the United States Fish and Wildlife Service to revise the Togiak National Wildlife Refuge Comprehensive Conservation Plan. The Department of Natural Resources has prepared this appendix to describe the current management guidelines for the State of Alaska shorelands and waters within the Togiak National Wildlife Refuge and lower Goodnews River. The State of Alaska reserves the right to amend or change this portion of the plan as conditions change or future needs develop.

BACKGROUND

The State of Alaska originally adopted the guidelines in Chapter III of the Togiak National Wildlife Refuge Public Use Management Plan as a State Land Use Plan in May of 1991. At the same time, the state-owned shorelands in the Togiak National Wildlife Refuge and lower Goodnews River were administratively designated as Special Use Lands, and later adopted as regulations in 2002. The Special Use Land Designation (SULD) was revised in 2008 in conjunction with the Comprehensive Conservation Plan and Public Use Management Plan revision process for the Togiak National Wildlife Refuge. These revisions to the 1991 SULD were intended to clarify guidelines and language presented in the original version.

These shorelands are designated Special Use Lands based on their special resource values. This designation authorizes restrictions on some uses and requires a permit for certain activities that would otherwise be considered "Generally Allowed" under 11 AAC 96.020. In this case, the Special Use Lands designation allows managers to implement the management guidelines as outlined within this Appendix.

The State of Alaska has special duties and management constraints with respect to waters, tidelands and shorelands (the lands underlying inland navigable waters) which arise from the Alaska Constitution and its principles commonly known as the public trust doctrine. The public trust doctrine requires the State to exercise authority to ensure public use of navigable waters for navigation, commerce, recreation, and other related purposes.

The Alaska Constitution (Article VIII, Sections 1, 2, 3, 6, 13 and 14) and Alaska Statutes (AS 38.05.126-.128) provide the legal basis for applying the public trust doctrine in Alaska. The Constitution states "free access to the navigable or public waters of the State, as defined by the legislature, shall not be denied any citizen of the United States or resident of the State, except that the legislature may by general law regulate and limit such access for other beneficial uses or public purposes."

The Alaska Department of Natural Resources is the agency entrusted with responsibility for managing state lands and waters. To meet the intent of the public trust doctrine, the Alaska Department of Natural Resources will manage state shorelands in the Togiak National Wildlife Refuge and on the lower Goodnews River under the guidelines outlined below.

SPECIAL USE LAND

As provided in regulation (11 AAC 96.014), the Department of Natural Resources has determined that these lands have special recreational and other special resource values warranting additional protections or other special requirements. State of Alaska shorelands within the Togiak National Wildlife Refuge and lower Goodnews River are therefore designated as Special Use Lands.

GUIDELINES FOR MANAGEMENT OF STATE OWNED SHORELANDS

Management of state shorelands in the Togiak National Wildlife Refuge and on the lower Goodnews River will be consistent with the Alaska Constitution, laws, regulations, and management guidelines included in this document. The following guidelines apply:

Generally Allowed Uses on State Shorelands

11 AAC 96.020 provides a list of uses that are “Generally Allowed” on state lands (including shorelands) without a permit. Modifications to these generally allowed uses for Special Use Lands in the Togiak National Wildlife Refuge and on the lower Goodnews River are established per regulation 11 AAC 96.014 (b)(8) and are detailed in this Appendix.

Short-term Camping on State Shorelands

Consistent with 11 AAC 96.020(a)(4)(A), camping is generally allowed on state-owned lands for personal, noncommercial purposes for no more than fourteen days at one site, using a temporary facility that can be readily dismantled and removed. For these Special Use Lands, camping is limited to three consecutive days at any one site per 11 AAC 96.014 (b)(8). Moving the entire camp at least two miles starts a new three-day period. Camping on state shorelands within ¼ mile (1,320 feet) of the outlet of Kagati Lake is restricted to one night per party every seven days.

Long-term Camping on State Shorelands

Permits may be issued for long-term camping necessary for fish and wildlife management, resource management and scientific research. Other long-term camping on state shorelands will not be permitted within the Togiak National Wildlife Refuge and on the lower Goodnews River unless specifically authorized by the State of Alaska Department of Natural Resources, Division of Mining, Land and Water, Southcentral Regional Office.

Human Waste

Human waste shall not be disposed of on state-owned shorelands, in accordance with AS 46.03.800 - 810. Human waste may be disposed of in a cathole at least 100 feet away from the Ordinary High Water Mark of streams, rivers, or lakes in accordance with the Alaska Department of Environmental Conservation (ADEC) regulation 18 AAC 72.020 (see also “Activities on Adjacent Private Uplands”). On privately-owned uplands, human waste may only be disposed of with the concurrence of the owner.

Identification of State Shorelands

Defining the location of the Ordinary High Water Mark, which delineates the boundary of state-owned shorelands, is often difficult and may require technical expertise. The Ordinary High Water Mark can usually be identified by the vegetation line along the bank or shore, or by other distinctive signs. It is defined as the mark along the bank or shore where the presence and action of the water are so common as to leave a natural line on the bank or shore. That line may be indicated by erosion, shelving, changes in soil characteristics, destruction of terrestrial vegetation, or other distinctive physical characteristics.

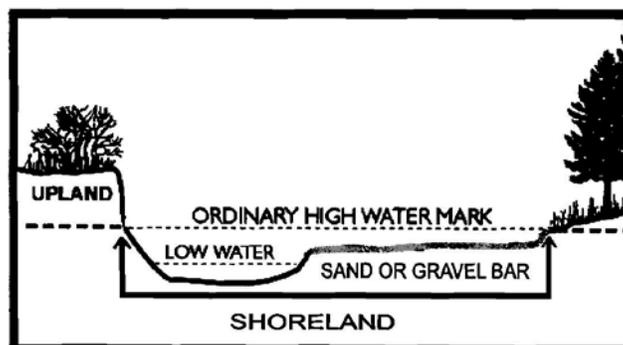


Figure 1: Delineation of State-Owned Shorelands

ACTIVITIES ON ADJACENT PRIVATE UPLANDS

Nothing in this document authorizes trespass on, or use of, adjacent privately-owned uplands. It is the responsibility of the river user to acquire all applicable permits prior to use of adjacent privately-owned uplands. Authorization to use privately-owned uplands may or may not include disposal of human waste. If a permit for disposal of human waste on adjacent private uplands is not secured, it is the responsibility of the river user to transport human waste to an ADEC-approved facility for disposal.

MODIFICATION AND AMENDMENT OF GUIDELINES

The Special Use Land Designation does not preclude any future land management action deemed by the State to be in the public interest. The development of any future regulations for the Special Use Land will require additional public involvement. The regulations will be reviewed and updated periodically as new data and technologies become available, and as changing social or economic conditions place different demands on state land.

SAFETY AND EDUCATION

The Department of Natural Resources discussed issues related to boating safety on the Goodnews River with local residents, river users and resource managers. As a result of these discussions and review of pertinent information, several methods of addressing boating safety have been considered, including: motorized restrictions, courtesy signage on the adjacent uplands, brush removal, and increased boater education and safety training. In addition to the management guidelines listed above, the Department of Natural Resources will continue to promote safe use of state waters by local residents, commercial operators and guided and unguided users. This can be accomplished through various means, including: boater safety and education programs offered by the State, brochures, and increased enforcement of existing state laws.

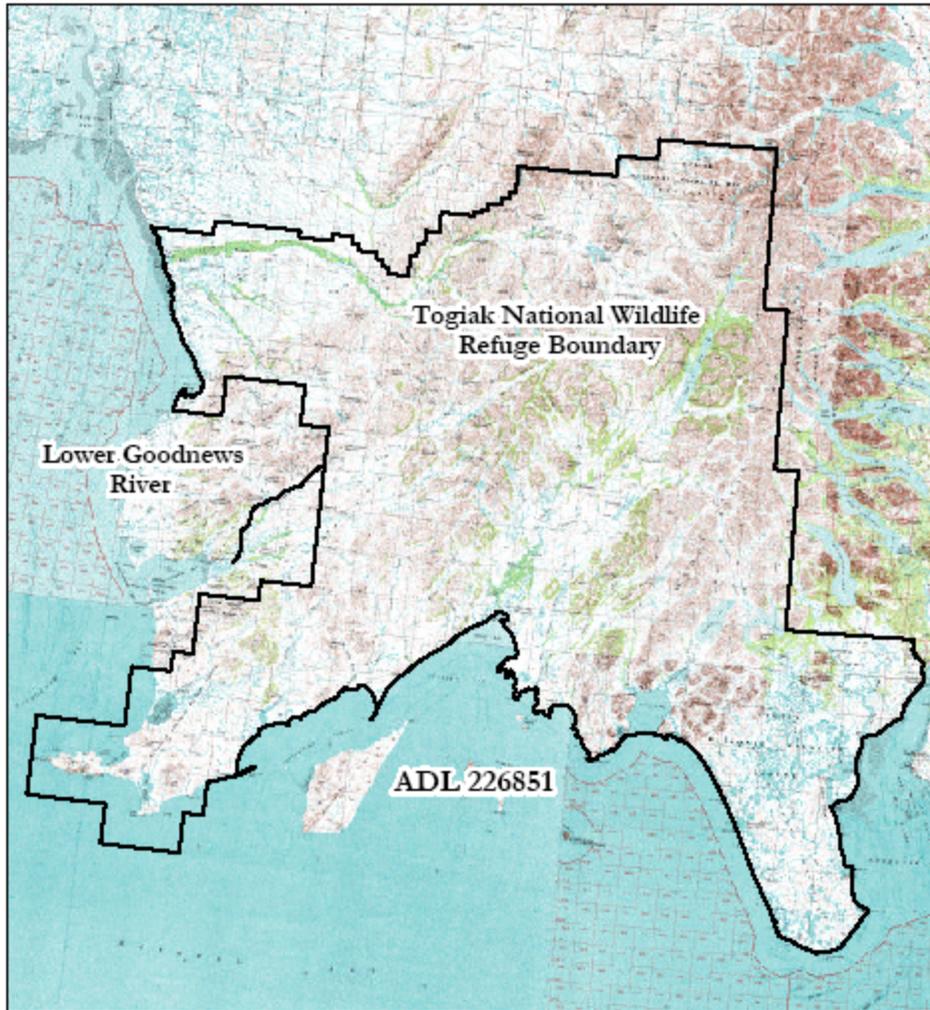
DEFINITIONS

Outlet of Kagati Lake. The confluence of Kagati Lake, and adjoining Pegati Lake, with the Kanektok River. Seward Meridian T. 003S R. 062W Section 33.

Temporary Facility. For the purposes of this Special Use Land Designation, temporary facilities are manmade structures that can be disassembled within 48 hours and must be removed and the site restored to its natural state at the end of the term of use. Examples of temporary facilities are frame, dome, or pup tents.

Togiak National Wildlife Refuge and Lower Goodnews River Special Use Area

Authorized: May 10, 1991



Legend

-  Special use lands include all shorelands within Togiak National Wildlife Refuge and along the Lower Goodnews River



Alaska Department
of Natural Resources
Division of Mining, Land & Water

Map Created On October 16, 2002

Appendix B Togiak Refuge Angler Survey

B. Togiak Refuge Angler Survey Results: 1995 and 2001

B.1 Introduction

Togiak Refuge managers continually strive to meet goals and objectives set forth by the Refuge Improvement Act, Alaska National Interest Lands Conservation Act (ANILCA), the Wilderness Act, and the Togiak Refuge Public Use Management Plan (PUMP). Understanding Togiak Refuge visitor characteristics, their motivations, perceptions of quality recreation, and opinions toward current and future management is fundamental in meeting these goals and objectives.

Management direction provided in various laws, regulations, and policy related to public uses of national wildlife refuges and wilderness areas is not based solely on objective information related to fish, wildlife, plants, and their habitats. Terms such as “outstanding opportunity,” “high-quality fishing experiences,” and “solitude” included in various laws and policies reflect the subjective nature of visitor perceptions and recreation experiences. Therefore, understanding the views, opinions, and perceptions of the public with respect to these and other related terms is very important when formulating management decisions.

In 1995, a survey designed to measure Refuge anglers’ perceptions of the quality of fish and wildlife-dependent recreation, wilderness experience opportunities (e.g., solitude), and other issues was conducted on the Kanektok, Goodnews, and Togiak Rivers. In 2001, a second, very similar survey was conducted on the same three rivers to measure how visitors’ perceptions and Refuge conditions had changed over time. This appendix describes results from the 2001 survey efforts, and contrasts relevant findings with those from the 1995 survey.

B.2 2001 Survey Methods

Beginning in late May 2001, Refuge visitors were contacted before their trips at the Dillingham airport and/or during their trips as part of current Togiak Refuge public-use programs. Visitors were informed about the survey and its purpose and asked if they would like to receive a questionnaire in the mail.

Following the Dillman total design method (Dillman 1978), questionnaires were mailed to anglers within two weeks of signing up for the survey, beginning in late July 2001. Final mailing of questionnaires was completed September 18, 2001. Approximately two weeks after the survey was initially mailed, participants received a postcard thanking them for completing the survey and asking for the survey to be completed if they had not done so. After an additional week to 10 days, those people who had not responded to either the initial survey mailing or the postcard were sent a second identical survey. The last of these follow-up questionnaires were mailed October 15, 2001.

B.3 Results: Visitor Experiences

B.3.1 Selected Visitor Characteristics

By the end of November 2001, 590 questionnaires had been mailed, eight returned as undeliverable, and 478 completed questionnaires received for a response rate of 81 percent. Questionnaires completed by off-duty U.S. Fish and Wildlife Service employees and guides were not included in this analysis, leaving 426 useable questionnaires: 148 from Goodnews River visitors, 233 from Kanektok visitors, and 45 from Togiak visitors. These numbers are consistent with the relative amount of use each river receives. Not every person responded to all questions, therefore some analyses in this appendix report sample sizes smaller than those listed in Table E-1.

Table E-1. Number of surveyed anglers in each major user group by river

River	Total sample size	Unguided floaters	Guided floaters	Total floaters	Guided motorboat anglers
Kanektok	233	89	62	151	82
Goodnews	148	85	14	99	49
Togiak	45	10	4	14	31

Questionnaires were received from 43 states and 12 foreign countries. When broken down by geographic region, 30 percent of survey respondents were from the west or northwest of the contiguous United States, 13 percent from the Rocky Mountain states, 10 percent from Alaska, 10 percent from the Midwest, 6 percent from Florida, 6 percent from foreign countries, and the remaining 25 percent from 25 other states.

The majority of anglers surveyed were more than 50 years of age, with guided anglers being slightly older, on average, than unguided anglers. The age distribution of anglers surveyed is listed in Table E-2.

Table E-2. Percentage of surveyed anglers by age cohort

Age Range (years)	Percentage of Respondents
16–24	4.2%
25–34	8.8%
35–44	17.4%
45–54	31.2%
55–64	21.3%
65 and older	16.5%

Anglers were asked to describe the amount of experience they had on rivers within the Togiak Refuge (including their current trip), other Alaska rivers, and other multi-day trips on other rivers around the world. Overall, guided float anglers had less experience than either guided motorized anglers or unguided float anglers.

B.3.2 2001 Selected Trip Characteristics

Most anglers who visit Togiak Refuge plan their trips several months in advance, particularly on the Kanektok, where 75 percent of respondents indicated that they planned their trips more than six months ahead of time (Table E-3).

Table E-3. Trip planning horizon by river

Trip Planning Horizon	Kanektok Anglers	Goodnews Anglers	Togiak Anglers
Less than one week	3%	5%	0%
One week to one month	2%	3%	8%
One to six months	20%	30%	30%
More than six months	75%	62%	62%

Results from the 1995 survey indicated significant differences in group size and lengths of stay between motorized and float anglers. Results for 2001 were similar to 1995 results and are listed in Table E-4.

Table E-4. Average group size and trip length by user group

User group	Average Number of Nights on the River	Average Group Size
Unguided float anglers	8	4
Guided float anglers	6	9
Guided Motorized anglers	7	10

Anglers were classified as visiting during chinook season, coho season, or “other,” depending on when their trip began. These seasons were defined by looking at 2001 Alaska Department of Fish and Game (ADF&G) commercial harvest data and fish weir data from the Kanektok River and the Middle Fork Goodnews River. The percentages of anglers visiting during the chinook and coho salmon runs are included in Table E-5.

Table E-5. Season of use by river

Season	Kanektok Anglers	Goodnews Anglers	Togiak Anglers
Chinook	33% (June 21–July 14)	26% (July 1– July 14)	35% (July 4–July 21)
Coho	48% (Aug. 4– Sept. 14)	58% (Aug. 4–Sept. 14)	21% (Aug. 14– Sept. 7)
Other	19%	16%	44%

B.3.3 Visitor Motivations and Expectations

Information from the 1995 survey suggests that Togiak Refuge anglers seek a wilderness fishing experience and place significant importance on being in a natural place, viewing scenery, and viewing wildlife. Similar to the 1995 survey, 2001 visitors were asked to rate various reasons for their trips on a five-point scale ranging from “not important” to “extremely important.” The percentages of respondents who felt that the given reasons were either “very important” or “extremely important” are listed in table E-6. Closer scrutiny of the 2001 data indicates that responses from float and motorized anglers were similar, but float anglers placed slightly more emphasis on setting-dependent factors such as viewing wildlife, viewing scenery, being in a wilderness, and opportunities for solitude. Differences were greatest with respect to unguided floaters, 69 percent of whom felt that opportunities for solitude were “very” or “extremely” important, compared to 45 percent of guided floaters, and 39 percent of guided motorized anglers. With respect to camping, 49 percent of unguided floaters felt opportunities for camping were “very” or “extremely” important, compared to only 30 percent for guided floaters.

Table E-6. Rating of visitor motivational factors

Motivational Factor	Percentage of respondents who rated as “very important” or “extremely important”
Fishing	92
Being in a natural place	80
Being in a wilderness	73
Scenery	57
Wildlife viewing	55
Opportunities for solitude	53
Being with fellow anglers	50
Being with family	36
Camping	32
Photography	31
Testing and using my gear	22
Learning about local cultures	21
Develop boating skills	4
Hunting	1

As might be expected, all groups rated fishing as the most important reason for their trip. Next to that primary activity, physical setting characteristics of the trip—such as being in a natural place, being in a wilderness, viewing the scenery, and viewing wildlife—rated higher than all social characteristics (e.g., opportunities for solitude or being with family or friends). These figures are only slightly different from the importance placed on these trip characteristics by visitors in 1995. Visitors surveyed in 1995 rated “being in a natural place” and “opportunities for solitude” as two of the most important aspects of their trips. In 1995, 77 percent of people surveyed indicated opportunity for solitude was “very important” or “extremely important” (compared to 53 percent in 2001).

In addition to their specific trip motivations, anglers on each river were asked about their expectations for conditions at the headwater lake, the upper river above the Wilderness Area boundary, and the lower river below the Wilderness Area boundary. They were then asked what types of settings they actually experienced and, finally, what type of setting they would prefer in these various river segments. The response choices for settings were as follows:

Primitive Recreation—Where one can expect to find solitude and very few traces of previous use. There is little or no development.

Semi-Primitive Recreation—Where one expects to meet a few other groups of users, but solitude is still possible, particularly at camps. One may see a few semi-permanent tent camps and traces of previous use at some sites.

Undeveloped Recreation—Where you expect to meet many other groups of users, and solitude is sometimes difficult to find. There are some semi-permanent tent camps and traces of previous use at many sites.

The majority of visitors to Kagati, Goodnews, and Kukaktlim lakes at the headwaters of the Kanektok and Goodnews River forks were float anglers. Guided floaters generally anticipated, experienced and preferred more primitive settings than did unguided floaters at these headwater lakes and along the upper river reaches within the Wilderness Area boundary. At Kagati Lake, 88 percent of guided visitors anticipated a primitive setting, and 75 percent of them reported experiencing that type of setting. Only 65 percent of unguided anglers anticipated a primitive setting at headwater lakes where they began their trip, and 50 percent of them reported that they actually experienced this type of setting. Unguided visitors to the Goodnews River both anticipated and experienced a more primitive setting than did Kanektok River visitors. Sixty-nine percent of motorized anglers anticipated a semi-primitive setting below the Wilderness Area boundary along the lower reaches of the three rivers, with almost the same percentage indicating that their experiences matched their expectations. On average, *all user groups preferred a more primitive setting than what they experienced or anticipated*. Based on the criteria used to define each setting, most visitors generally would have preferred more solitude and less evidence of other users than what they actually experienced.

Compared to 1995 visitors, 2001 visitors generally preferred and experienced more primitive settings while traveling along the three rivers. This suggests that many conditions may have improved during the intervening time. However, 2001 survey responses suggest that some conditions at Kagati and Goodnews Lakes may have degraded since 1995. Seventy percent of 1995 visitors reported experiencing a primitive setting at these two lakes, compared to 57 percent in 2001.

B.3.4 Experience Impacts and Visitor Tolerances

Past outdoor recreation research has identified some specific natural-resource and social-setting conditions that tend to have a negative influence on visitors' enjoyment of wilderness settings. Drawing from this research, Togiak Refuge visitors were asked to rate the significance of selected conditions that they might encounter during their trips. For each potential negative condition (impact), survey participants could choose from the following responses: "doesn't matter;" "is annoying, but only if frequent;" "is annoying even if infrequent;" or, "can ruin the trip."

Analyses show little variation in the rating of impacts across the three rivers considered in this study. However, there were important differences between different user groups (guided motorboat clients, guided float clients, and unguided floaters). These three groups generally rated impacts in the same order, but as shown in Table E-7, guided float anglers consistently felt that the listed factors could have a potentially greater impact on their recreational experience. Percentages for unguided float anglers and motorized anglers were very similar, so they are grouped together in the table. One important difference not reflected in the table is that 27 percent of guided float anglers felt seeing other float groups would be "annoying even if infrequent," compared with only nine percent of other visitors who felt this way.

For all three user groups, encounters that involved direct competition for space and extended interaction with other people were rated as more detrimental than were other types of encounters that are shorter in duration (such as merely seeing another party). Compared with the 1995 survey, the 2001 ratings of these potential impacts were very similar.

Table E-7. Significance of potential trip impacts, by user-group

Potential Impact	Percent of guided float anglers who felt the impact "can ruin the trip"	Percent of unguided float and guided motorized anglers who felt the impact "can ruin the trip"
Competition for fishing sites	51	38
Competition for campsites	42	36
Seeing unburied human waste	39	26
Seeing litter	38	25
Encounters with sport anglers in motor boats	38	(unguided floaters 26, motorized anglers 4)
Camping within sight/ sound of other groups	33	24
Seeing other groups with many boats (over 4)	26	14
Number of permanent camps/ structures	21	(unguided floaters 21, motorized anglers 12)
Seeing other large groups (over 8 people)	17	11
Encounters with local villagers in motor boats	8	(unguided floaters 7, motorized anglers 0)
Seeing helicopters	4	3
Seeing airplanes	0	0

In addition to rating the significance of potential impacts, respondents were asked to consider the following:

- The amount or percentage of each impact they experienced during their river trip;
- If what they experienced was more than they expected;
- What amount or percentage of each impact they would be willing to accept or tolerate.
- The instructions provided to visitors in the questionnaire read as follows:
- "For each of the following impacts, please estimate the amount you experienced or saw on your most recent trip, and then estimate the amount you would accept or tolerate before your trip would be compromised."

Based on visitors' responses, average amounts experienced and tolerance values were calculated for each impact. In addition, a series of statistical tests was conducted to determine if the tolerances reported by each angler group were, in fact, different enough from the conditions they experienced to be of concern. Bold type in Tables E-8, E-9, and E-10 indicates those impacts that significantly ($p \leq 0.05$)² exceeded visitor tolerances. In those cases where 2001 visitor tolerances were significantly greater than those reported in 1995 (meaning the average reported tolerance level had changed over time), the values are in bold type and noted with an asterisk (*). In those cases where 2001 visitor tolerances were significantly exceeded, values are also in bold type and noted with two asterisks (**).

² For comparing 2001 with 1995 visitor tolerances, Mann-Whitney U-tests were used. For comparing 2001 experiences with visitor tolerances, paired Wilcoxon signed-rank tests were used.

Table E-8. Goodnews River angler tolerances and conditions experienced (n=143)

	2001 Average visitor tolerance threshold	Conditions actually experienced	% Reporting conditions at tolerance threshold	% Reporting conditions exceeded tolerance threshold	1995 Average visitor tolerance threshold
Litter (average percent of sites/trip)	4.3% *	8.0% **	35	20	3.3%
Human waste (average percent of sites/trip)	3.0% *	4.3%	39	13	0.8%
Fishing sites passed up (average percent of sites/trip)	12.4%	10.6%	24	19	9.5%
Campsites passed up (average percent of sites/trip)	11.6% *	5.7%	18	9	9.8%
Nights near other groups (average percent of nights/trip)	15.2% *	9.7%	33	12	8.5%
Structures on upper river (average seen/day)	1.4	.8	32	3	1
Motorized groups on upper river (average encounters/day)	.9	.5	28	8	0.9
Motorized groups on lower river (average encounters/day)	4.5 *	5.1 **	27	32	3.3
Time near other groups (average percent of time/trip)	13.5%	13.3%	25	18	13.2%
Float groups at lake (average encounters/day)	1.5	1.0	15	11	1.7
Float groups on upper river (average encounters/day)	2.3	1.6	19	12	2.2
Float groups on lower river (average encounters/day)	3.5	3.6	17	24	3.4

*2001 tolerance significantly greater than 1995 tolerance

** 2001 tolerance significantly exceeded

There are not any significant differences between 1995 and 2001 visitor observations or tolerances for the number of other float groups at Goodnews Lake, the upper river, or lower river. However, a greater percentage of anglers in 2001 reported seeing more float groups than expected. Survey responses also indicate a greater number of float groups encountered in 2001 at Goodnews Lake and on the upper Goodnews River within the Togiak Wilderness Area compared to 1995. This is consistent with the greater

number of use-days reported by commercial sportfishing guides and air-taxi operators for the Goodnews River.

Anglers indicated they would accept or tolerate, on average, encountering up to 1.6 groups per day at Goodnews Lake, 2.3 groups per day on the upper river, and 3.5 groups per day on the lower river. Forty-one percent of those anglers reported the number of encounters with float groups on the lower Goodnews River (outside the Togiak Wilderness Area, and the Togiak Refuge) was equal to or more than what they were willing to accept or tolerate. These results show that, while visitors' average tolerance for this impact was not exceeded at a statistically significant level, a large proportion of visitors did experience conditions that were near threshold levels.

When it comes to motorized use, visitors to the Goodnews River in 1995 reported seeing an average of 3.7 motorized groups per day on the lower river outside the Togiak Refuge. In 2001 this average increased to 5.1 motorized groups on the lower Goodnews River. In 2001, visitors were willing to tolerate seeing more boats outside the Togiak Refuge on the lower river (average of 4.5 groups per day), but 59 percent of those surveyed indicated this was as much as or more than they were willing to tolerate. Along the Wilderness Area portion of the Goodnews River, respondents were willing to tolerate very few motorized groups (one group per day), and on average they encountered about half that many.

Anglers surveyed in 1995 reported camping within sight or sound of other groups an average of 6.5 percent of nights on the river, compared to 2001 anglers who reported an average of 9.7 percent of nights camped within sight or sound of other groups. Statistical analysis indicates this increase was significant. However, 2001 visitors were also more tolerant of this impact, and consequently, visitors, on average, did not feel conditions exceeded their tolerances.

For 11 of the 13 impacts, 2001 tolerances were greater than those expressed by visitors surveyed in 1995. People were willing to tolerate a greater percentage of sites with litter, more time camped within sight or sound of others, more sites with visible signs of human waste, passing up campsites more often because they were occupied, and seeing more motorized groups on the lower river outside the Togiak Refuge. These tolerances were all significantly greater than those indicated in the 1995 survey.

In 2001, the percentage of sites people saw with litter (eight percent) was significantly greater than they were willing to tolerate (4.3 percent). This was due mostly to the very low tolerance expressed for this impact. Sixty-eight percent of visitors on the Goodnews River indicated they were not willing to tolerate any sites with visible litter. Tolerances for the percentage of sites with human waste were not exceeded at a significant level according to the criteria used (4.3 percent of sites observed; 3 percent of sites acceptable).

Kanektok River:

There do not appear to be any significant differences between 1995 and 2001 visitor observations or tolerances for the number of other float groups at Kagati Lake, the upper river, or lower river. The percentage of Kanektok anglers who reported seeing more float groups than expected increased slightly at Kagati Lake, but decreased slightly for the upper and lower river reaches.

Statistical tests confirm that for 11 of the 13 impacts asked about in the questionnaire, visitors in 2001 were more tolerant than those in 1995. Tolerances reported for the percentage of sites with human waste impacts, fishing sites passed up because they were occupied, nights camped within sight or sound of other groups, the number of motorboats encountered on the lower Kanektok, and the number of temporary camps on the upper river were significantly greater than those reported in 1995. In addition, anglers in 2001 reported fewer observations for eight of the 13 impacts. According to the 2001 questionnaire, anglers passed up campsites 4.1 percent of the time because they were occupied, which was significantly less than the 6.5 percent of times 1995 visitors indicated they passed up campsites.

Table E-9. Kanektok River angler tolerances and conditions experienced (n=225)

	2001 Average Visitor Tolerance threshold	Conditions Actually Experienced	% Reporting conditions at tolerance threshold	% Reporting conditions exceeded tolerance threshold	1995 Average Visitor tolerance threshold
Litter (average percentage of sites/trip)	2.3%	5.0% **	40	18	2.2%
Human waste (average percentage of sites/trip)	2.1% *	2.1%	45	9	0.6%
Fishing sites passed up (average percentage of sites/trip)	13% *	12.9%	26	21	10.2%
Campsites passed up (average percentage of sites/trip)	7.9%	4.1%	27	7	7.9%
Nights near other groups (average percentage of nights/trip)	11.9% *	7.2%	35	8	7.9%
Structures on upper river (average seen/day)	2.3 *	1.4	29	3	1.5
Motorized groups on upper river (average encounters/day)	1.9	1.4	22	13	1.3
Motorized groups on lower river (average encounters/day)	7.7 *	11.1 **	15	41	5.2
Time near other groups (average percentage of time/trip)	16.9%*	17.0%	29	22	11.9%
Float groups at lake (average encounters/day)	1.5	1	20	5	1.4
Float groups on upper river (average encounters/day)	2.6	2.1	21	13	2.3
Float groups on lower river (average encounters/ day)	4.7	5.5 **	20	28	5.0

*2001 tolerance significantly greater than 1995 tolerance

** 2001 tolerance significantly exceeded

Visitors in 2001 seemed to be willing to tolerate slightly more competition for fishing sites. On average, they reported passing up fishing sites 13 percent of the time because they were already occupied. Forty-seven percent of respondents indicated this was equal to or more than what they felt was acceptable.

Togiak River visitors who responded to the 2001 survey seem to think that the number of boats, people, and structures along the upper river are within acceptable limits. However, 2001 visitors encountered more sites with litter and human waste, and more groups on the lower river, than did 1995 visitors. Despite average tolerances that were greater than those reported by 1995 visitors, over one quarter of 2001 Togiak River visitors reported that the number of motorized groups they encountered on the lower river and the amount of time they spent near other groups exceeded their tolerance thresholds. In addition, 18 percent of 2001 visitors reported that the percentage of sites they encountered with litter exceeded their tolerance thresholds. These findings represent a shift from 1995, when Togiak River visitors did not report that their tolerances were exceeded for any of these impacts.

Togiak River:

Table E-10. Togiak River angler tolerances and conditions experienced (n=42)

	2001 Visitor Tolerance threshold	Conditions Actually Experienced	% Reporting conditions at tolerance threshold	% Reporting tolerance exceeded	1995 Visitor Tolerance threshold
Litter (average percentage of sites/trip)	5.4% *	11.2% **	28	18	0.0%
Human waste (average percentage of sites/trip)	4.38%	6.8%	40	6	0.0%
Fishing sites passed up (average percentage of sites/trip)	12.5%	11.5%	18	22	11.7%
Campsites passed up (average percentage of sites/trip)	8.1%	.3%	24	0	6.0%
Nights near other groups (average percentage of nights/trip)	15.7%	6.9%	28	0	6.0%
Structures on upper river (average seen/day)	1.9	2.3	24	6	3.0
Motorized groups on upper river (average encounters/day)	3.6	2.5	8	16	3.6
Motorized groups on lower river (average encounters/day)	8.4 *	9.8 **	12	28	4.0
Time near other groups (average percentage of time/trip)	17.9%	22.4% **	26	26	12.4
Float groups at lake (average encounters/day)	1.7	.5	2	2	3.9
Float groups on upper river (average encounters/day)	2.8	1.6	2	10	2.4
Float groups on lower river (average encounters/day)	4.7	5	6	14	

*2001 tolerance significantly greater than 1995 tolerance

** 2001 tolerance significantly exceeded

B.3.5 Perceived Crowding in the Togiak Wilderness

One criterion frequently used for evaluating wilderness settings is the opportunity for solitude, measured in terms of the absence or presence of crowding. When asked to agree or disagree with the statement [referring to conditions both in and outside of the Wilderness], “Fishing conditions were uncrowded,” 385 respondents to the 2001 questionnaire agreed that conditions were uncrowded, and 39 respondents disagreed. In 2001, visitors were also asked to rate the crowding they experienced “upstream from the wilderness boundary” [i.e., within the Wilderness] on a nine point scale from “not at all crowded” to “extremely crowded.” Only one visitor rated conditions as “extremely crowded.” Visitor ratings of crowding in the Togiak Wilderness Area are displayed in Table E-11.

Table E-11. Relative crowding by river

River	Visitor Rating of Crowding in the Togiak Wilderness Area (upper river)		
	“not at all crowded”	“lightly crowded”	“moderately crowded”
Kanektok	66%	30%	4%
Goodnews	70%	24%	6%
Togiak	85%	8%	7%

B.3.6 Visitor Interaction with Local Residents and USFWS Personnel

In past years, interaction between local residents and recreational anglers has in some cases been a source of tension and conflict along rivers within the Togiak Refuge. Visitors in 2001 were asked to indicate where they had contact with local residents and how those contacts affected their trip.

Table E-12. Effect of visitor contact with local residents by river

	Contact with local residents	Added to Trip	Detracted from Trip	No Effect on Trip
Kanektok River	80%	60%	6%	34%
Goodnews River	77%	71%	3%	26%
Togiak River	56%	39%	0%	61%

The most common comments from the 336 survey respondents who had contact with local residents indicate they gained an appreciation for local residents and enjoyed learning about new and different cultures and lifestyles. Many visitors commented they found local residents helpful, courteous, friendly, positive, or interesting.

The Togiak Refuge River Ranger program has been in place since the early 1990s. Participants in the 2001 survey were asked to indicate if they had contact with Togiak Refuge River Rangers, to indicate if the contact was positive, and to indicate which of the information they received was most helpful, and/or what information they would have liked to receive.

Sixty-seven percent of respondents indicated Togiak Refuge River Rangers contacted them on the river, and 31 percent of visitors were contacted before their trip by Togiak Refuge staff in Dillingham. Of those who were contacted, all but one person reported their contact as positive.

Generally, visitors found information about bear safety, fishing practices or regulations, and river conditions the most helpful. While more than 50 percent of anglers indicated they did not need additional information, some other visitors indicated they would like more information about fishing and fishing regulations, local history and culture, fish life history, and refuge projects.

Survey respondents were also given space in the 2001 questionnaire to provide any additional comments about the River Ranger program. The vast majority of comments were positive and supportive of the program. In general, response to the River Ranger program was more positive in 2001 than in 1995. In 1995, 10 percent of people surveyed indicated contact with River Rangers detracted from their trip.

B.3.7 Plans to Return

Fifty-nine percent of survey respondents indicated that they plan to return to the river they visited in 2001. When asked to give a brief explanation of why they might return; 131 visitors cited the great fishing; 48 commented about the scenery; 36 noted the river itself; 33 noted wilderness, solitude, and remoteness; and 33 visitors cited the overall experience.

Among respondents who indicated that they did not plan to return, 73 (19 percent) indicated they wanted to experience a new river, and 41 visitors cited logistics, planning problems, age, and other external factors. Thirty-eight visitors indicated the cost of the trip itself was a reason for not returning, and only 15 (four percent) responded that crowding was one reason they might not return to the river. These results represent a shift from 1995 responses, when more than 80 percent of visitors indicated they planned on taking a future trip on the river in question.

B.4 Results: Visitor Opinions About management Strategies

One purpose of the 2001 visitor survey was to determine what support or opposition exists among anglers for current and potential future management actions. This section summarizes visitors' opinions regarding potential management actions. Graphs in this section may display values that do not add up to 100 percent because respondents who indicated "neutral/ not sure" were not included in the totals.

B.4.1 Permits for Unguided Float Use

Visitors were asked about their opinions regarding possible management actions ranging from providing additional education to implementing a permit system for unguided visitors. There were no significant differences in visitors' opinions between the three rivers covered by this study. However, there were substantial differences between different user groups (i.e., guided and unguided visitors).

With respect to permits, visitors were asked to consider three different potential systems: one that would require a permit and possibly implement use-limits year round; one that would only require a permit during the chinook and coho fishing seasons; and one that would require a permit but would not limit the number of people. Responses for all respondents as a group are shown in Figure E-1.

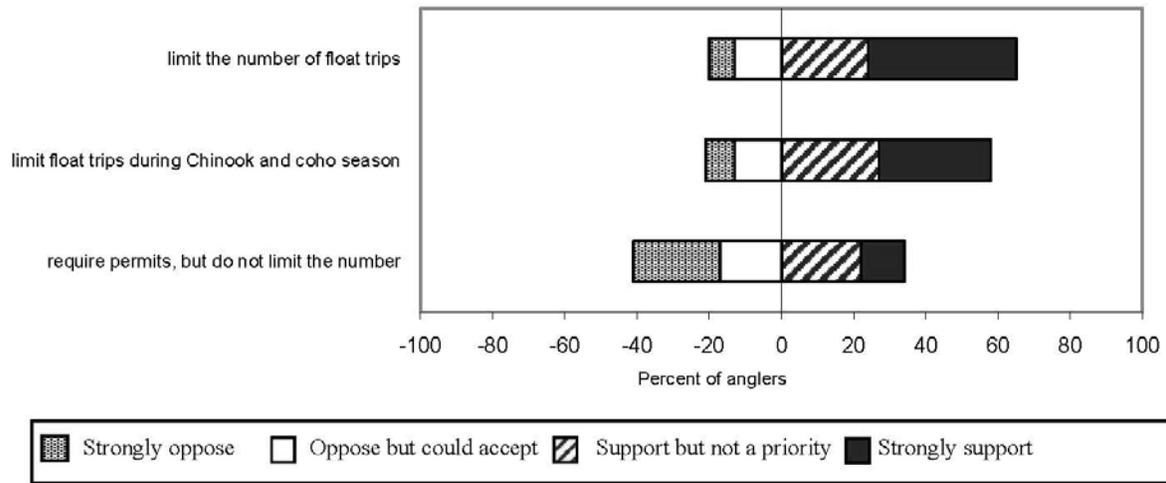


Figure E-1. Opinion toward permit options-all anglers

As shown in Figure E-2, 44 percent of unguided floaters indicated they would support, or strongly support, limiting the number of unguided float trips allowed. Another 17 percent were neutral or not sure, and the remaining 39 percent would oppose (but could accept) or would strongly oppose such a limited-permit system. When asked about permits during chinook and coho season only, the proportion of unguided floaters who would support or strongly support dropped to 38 percent, with more people being neutral or not sure. Finally, only 28 percent supported or strongly supported a permit system with no limits, and 44 percent opposed (but could accept), or strongly opposed this third type of permit system. The proportion of unguided visitors supporting these potential actions is notable considering they represent the opinion of those visitors who would presumably be most impacted by a permit system. When responses from all user groups are considered, 64 percent support or strongly support limiting unguided float trips. These values are similar to those from the 1995 survey.

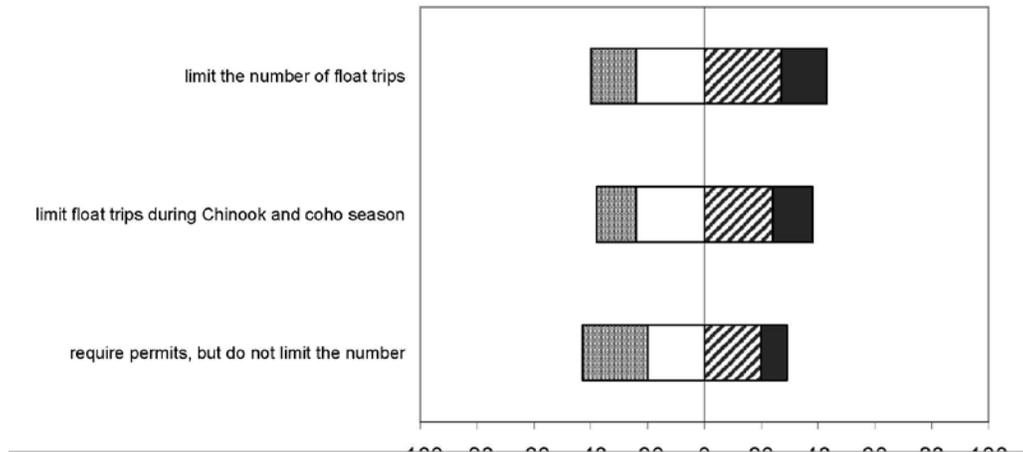


Figure E-2. Non-guided float angler opinion toward permit options

Visitor opinion regarding limited permits for unguided float use is clearly divided according to user group. While 44 percent of unguided floaters indicated support for such permits, a strong majority (79 percent) of guided visitors indicated that they would support limits on unguided float use. This division may be, in part, a perceived equity issue. This interpretation is supported by the data in figure E.3, which show that unguided floaters are willing to give up access for a better trip, but they do not feel there is a need for such restrictions simply because guided visitors are limited. Most guided anglers (82 percent), on the other hand, indicated that they did support matching limits for unguided users. Note that fewer unguided anglers agreed that access limits would lead to an improved experience. When the opinions of all survey respondents are considered together, it appears that a majority of river users would support limits on unguided floaters.

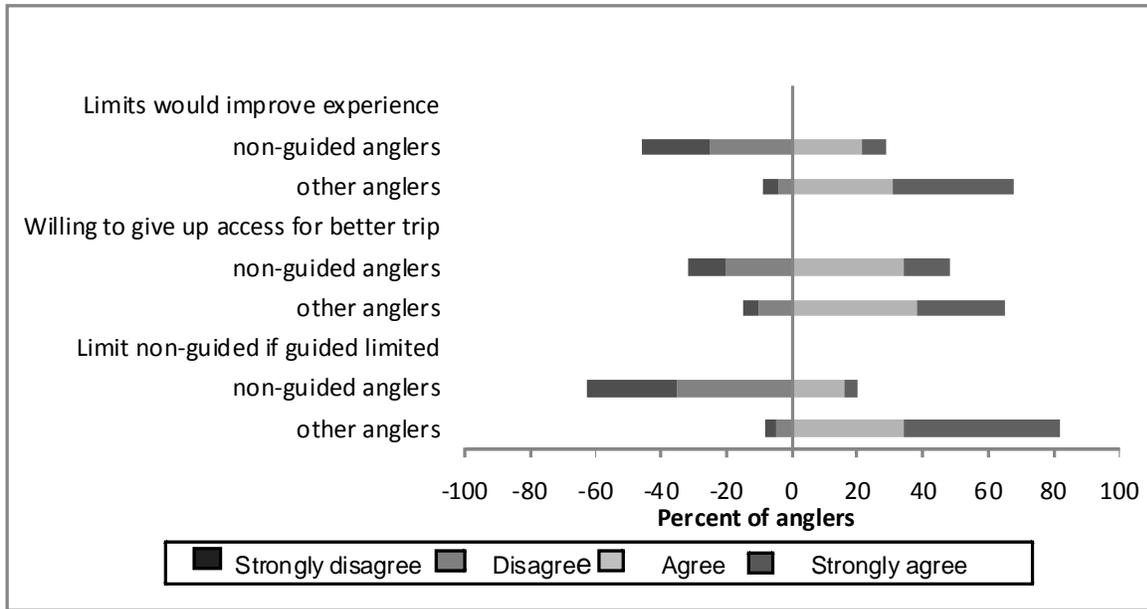


Figure E-3 Angler opinions toward access restrictions.

B.4.2 Waste Management

Visitors in 2001 were asked about their opinions with respect to building toilets in some high-use areas and establishing a requirement that human waste be packed out. As shown in Figure E-4, 17 percent of unguided floaters supported or strongly supported packing out waste. Thirty-five percent of unguided floaters indicated that they would support constructing toilets in some high use areas along the rivers, and 46 percent indicated that they would be opposed or strongly opposed to such an action.

Guided floaters were much more supportive of requiring float groups to pack out waste compared to unguided visitors. Sixty percent of guided float anglers indicated they would support or strongly support such a requirement. At present, float guides operating within the Togiak Refuge are required to ensure that their clients properly dispose of waste, and some guides make it a practice to pack out all waste.

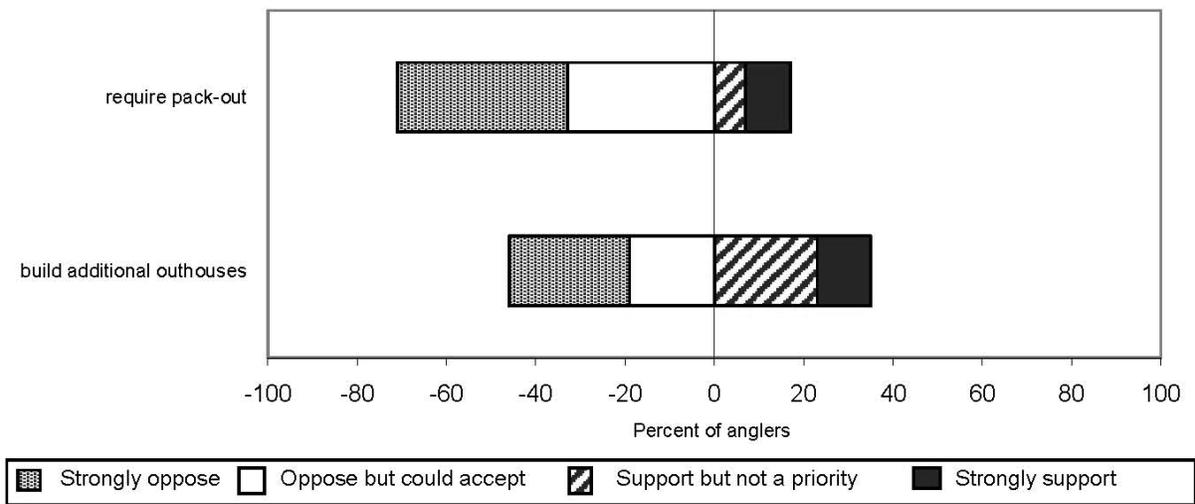


Figure E-4. Opinion toward required pack out or additional outhouses

B.4.3 Boating Safety

In the recent past, some Refuge visitors have registered complaints about unsafe boating practices, possible boating safety violations, and even near-fatal accidents. One section of the 2001 questionnaire was designed to measure the prevalence of safety concerns across the visitor population. Survey participants were asked how safe they felt on the river, if the actions of others negatively affected their trip, and how they would feel if managers were to implement additional regulations such as horsepower or boatsize restrictions.

The vast majority of respondents (98 percent) indicated that they felt safe while fishing. However, almost 100 respondents (22 percent of the sample) indicated that the actions of another person or group negatively affected their trips. Only eight of these negative encounters were described as specifically relating to boating safety, yet survey responses may still indicate that boating safety may be an issue of broader concern. Sixty-two percent of motorized visitors indicated that they would support or strongly support limits on motorboat size, with only 16 percent opposed or strongly opposed to such limits. Similarly, 58 percent supported or strongly supported horsepower restrictions, with only 19 percent opposed or strongly opposed (Figure E-5). In comparison, only about 40 percent of motorized visitors in 1995 supported size or horsepower restrictions.

Among non-motorized (float) groups, 83 percent of respondents indicated that they would support or strongly support restrictions on motorboat size, and a similar proportion indicated support for horsepower restrictions. Because of this strong support by floaters, restrictions on motorboat size and horsepower were among the most widely supported potential management actions that were addressed in the 2001 visitor survey. Across the entire visitor sample (motorized and non-motorized users combined), just over 76 percent of visitors supported such motorboat restrictions.

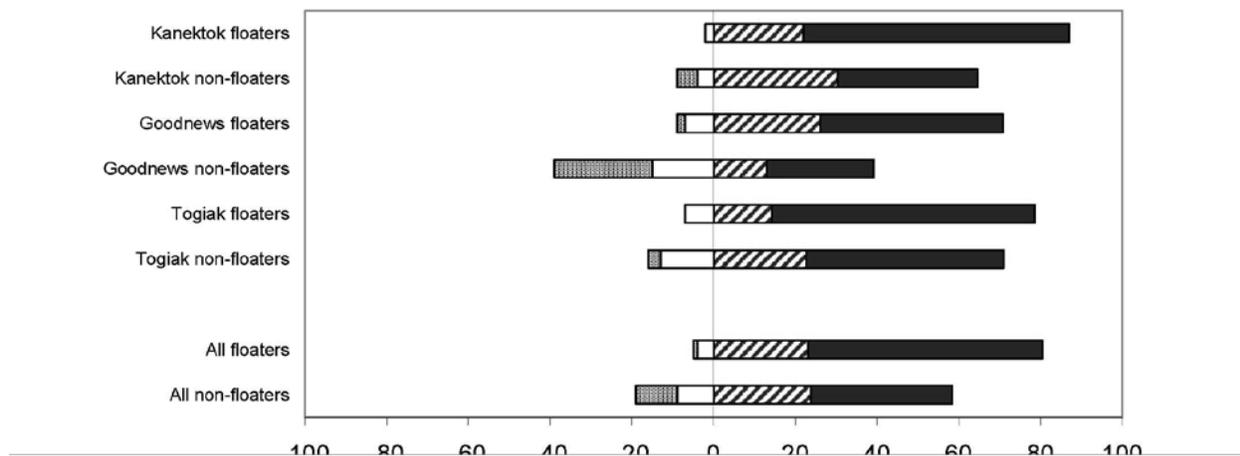


Figure E-5. Opinion toward limiting horsepower

B.5 Summary and Conclusions

The 1995 and 2001 surveys provide a clear picture of typical Togiak Refuge river visitors. These visitors are older, well-educated male anglers from throughout the United States who seek a high-quality wilderness fishing experience that places importance on naturalness and solitude.

Overall, most visitors feel they are able to find the types of experiences they seek, but there is room for improvement and cause for concern about maintaining the opportunities for these experiences in the future. In particular, litter and evidence of improperly disposed human waste continue to be problems. This is, in part, due to the very low tolerance most recreational users have for these impacts, which not only represent evidence of other people but also evidence of behavior considered inappropriate and illegal.

Competition for fishing areas and campsites were the two most important potential impacts for 2001 visitors. While competition for camping areas and fishing sites was not found to be a statistically significant impact when analyzing responses, more than 40 percent of visitors felt the percent of fishing sites or campsites passed up because they were occupied was unacceptable. Based on the importance of these impacts to anglers, they deserve careful consideration.

According to Togiak Refuge commercial guide and air-taxi client use reports, float angler use in 2001 was about eight percent greater than in 1995, but this difference is small in terms of actual anglers. Analyses of survey responses did not detect a statistically significant influence of this increased use on the number of people observed or on the percent of time near other groups reported for the Togiak Wilderness Area. However, visitors responses do indicate a greater number of float groups encountered in 2001 at Goodnews Lake and on the upper Goodnews and Kanektok rivers within the Togiak Wilderness Area

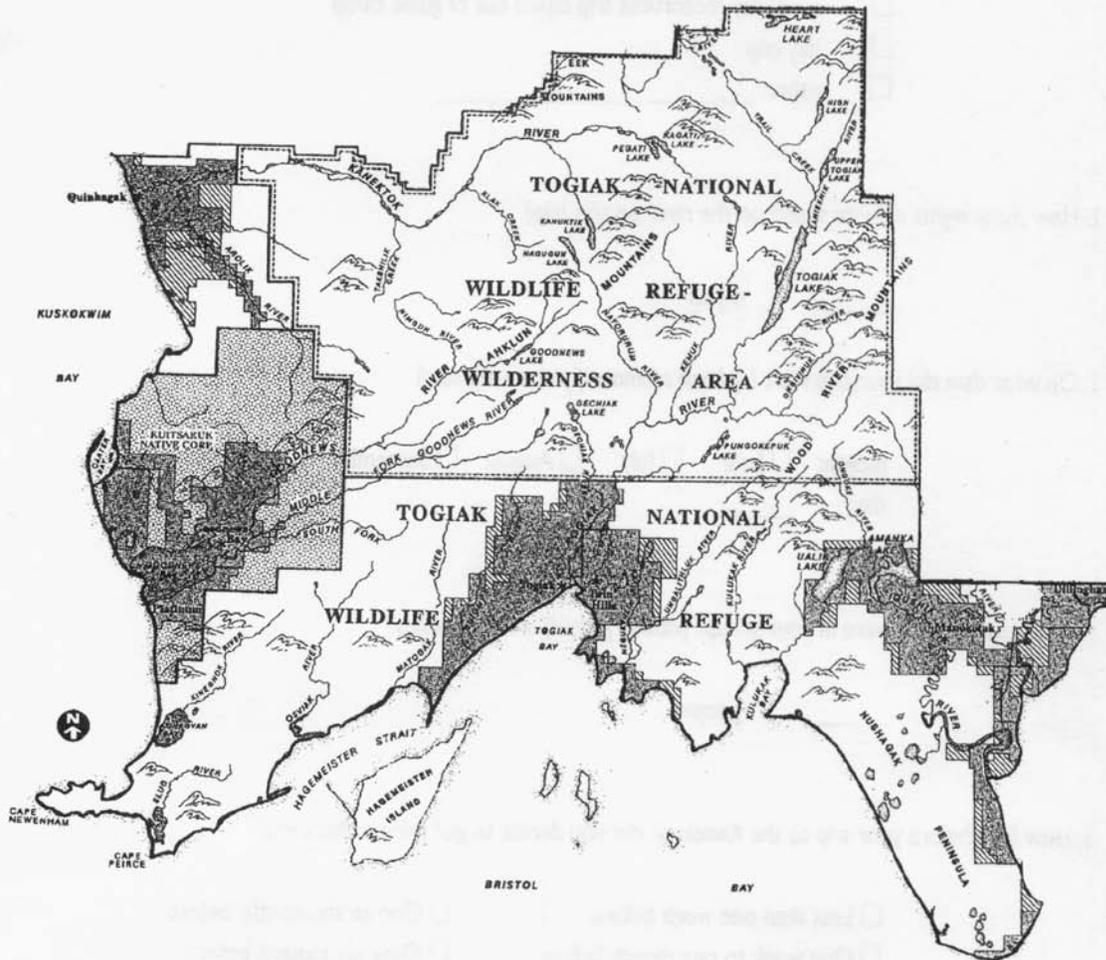
At first glance, a comparison of 1995 and 2001 angler survey results seems to indicate conditions on the Kanektok and Goodnews rivers have improved. On closer inspection, it is evident visitors in 2001 were more tolerant of impacts and that actual conditions within the Togiak Refuge changed relatively little.

Visitors in 2001 were more tolerant of crowding, evidence of human waste, and competition for space than were visitors in 1995. In 1995, 80 percent of visitors indicated they planned on returning for a future visit; in 2001, however, this proportion dropped to 59 percent. These values suggest that there is a considerable amount of visitor turnover and possibly visitor displacement. It is possible that visitor tolerances appear to have changed because the visitors themselves have changed, but determining the underlying causes of shifts in tolerances is outside the scope of the 2001 survey.

B.6 References

- Dillman, D.A. 1978. *Mail and Telephone Surveys: The Total Design Method*. New York, New York: Wiley-Interscience. 375 pages.
- USFWS. [unpublished]. Special-use permit reports. Dillingham, Alaska: U.S. Fish and Wildlife Service, Togiak National Wildlife Refuge.
- Whittaker, D. 1996. Kanektok, Goodnews, and Togiak Rivers user survey findings and implications. Togiak National Wildlife Refuge.

Kanektok River Recreation Use Survey Summer 2001



U.S. Fish and Wildlife Service
Togiak National Wildlife Refuge



OMB #0569-0108 expires 01/31/2003

Section A. Your Most Recent Trip to the Kanektok

1. What type of trip did you take on your most recent visit to the Kanektok River? (only check one response)

- guided float trip → # of boats used by your group: _____
- private float trip → # of boats used by your group: _____
- multi-day motorboat trip based out of guide camp
- day trip
- other: _____

2. How many nights did you spend on the river on this trip?

_____ nights

3. On what date did your trip start ? (please estimate if you are not sure)

month: June July August September
 day: _____

4. How many people were in your group? (include yourself and any guides)

_____ people

5. How long before your trip to the Kanektok did you decide to go? (please check one)

- Less than one week before
- One to six months before
- One week to one month before
- Over six months before

6. Counting this trip, about how many trips have you taken on each of the following rivers?

	Number of guided trips:	Number of non-guided (private) trips:
The Kanektok	_____	_____
The Goodnews	_____	_____
The Togiak	_____	_____
Other rivers in Alaska	_____	_____

7. When did you make your first trip to a river on the Togiak refuge?

_____ year of first trip

8. About how many multi-day trips have you taken on rivers anywhere in the country or world?

_____ trips

9. Do you plan to come to the Kanektok again?

Yes No Not sure

9a. Could you please explain why you might or might not return? _____

Section B. Reasons for Visiting

1. There are a variety of reasons why people take trips to the Kanektok River. Some possible reasons are listed below. Please indicate how important each reason was for you. (Circle one number per item)

	Not important	Somewhat Important	Important	Very Important	Extremely Important
For the fishing	1	2	3	4	5
Hunting opportunities	1	2	3	4	5
Camping opportunities	1	2	3	4	5
Viewing the scenery	1	2	3	4	5
Viewing wildlife	1	2	3	4	5
Being in a natural place	1	2	3	4	5
Developing boating skills	1	2	3	4	5
Opportunities for solitude	1	2	3	4	5
Being with fellow anglers	1	2	3	4	5
Being with my family	1	2	3	4	5
Photography	1	2	3	4	5
Being in a wilderness	1	2	3	4	5
Learning about local cultures	1	2	3	4	5
Testing and using my gear	1	2	3	4	5
Other: _____	1	2	3	4	5

2. Which of the following fish were you fishing for (targeting) on this trip? For each type of fish you targeted, please check the box that shows your evaluation of the fishing for that type of fish.

	Targeted?		Excellent	Good	Fair	Poor
King salmon	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Silver salmon	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sockeye salmon	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lake trout	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rainbow trout	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Char	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grayling	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/> no <input type="checkbox"/> yes →	Fishing was:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Is there anything you'd like fisheries managers to know about based on your fishing experience this trip? _____

4. About what proportion of the time you were actually fishing did you spend each of the following ways?

Fishing from boat _____ percent of the time
 Fishing from shore _____ percent of the time
 Wading _____ percent of the time

5. For each item, please check the box that shows how strongly you agree or disagree with the following statements about the fishing you experienced on the Kanektok.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
a. I felt safe while fishing	<input type="checkbox"/>				
b. Fishing conditions were uncrowded	<input type="checkbox"/>				
c. The fishing was challenging	<input type="checkbox"/>				
d. There was a reasonable opportunity to catch fish	<input type="checkbox"/>				
e. There was minimal conflict with other anglers or uses of the Refuge	<input type="checkbox"/>				
f. I practiced the highest standard of ethical behavior when catching and releasing fish	<input type="checkbox"/>				
g. My understanding and appreciation for the fisheries resource increased	<input type="checkbox"/>				
h. My understanding and appreciation for the Togiak Refuge increased	<input type="checkbox"/>				

6. Did you have contact with the US Fish and Wildlife Service river rangers on the river?

- Yes No—*please go to #7*

6a. If yes, was your contact with the rangers positive or negative, and do you have any comments about the ranger program?

7. Were you contacted by US Fish and Wildlife Service staff at Dillingham airport?

- No
 Yes
 I did not travel through Dillingham airport
 Don't know

8. Did you receive information about the river or river practices?

- Yes No—*please go to #9*

8a. What information did you find most helpful? _____

9. Are there any topics that you wanted to know more about? _____

10. Did you have any contact with local residents? (Check all that apply)

- No—*please go to #11*
 Yes, at the airport/waiting to fly out
 Yes, on the upper river
 Yes, on the lower river

10a. If yes, did this contact add to, detract from, or not make a difference in your trip?

- Seeing local residents added to my trip
 Seeing local residents detracted from my trip
 Seeing local residents didn't affect my trip one way or the other

10b. Could you please explain your answer? _____

11. In general, how crowded was the upper river (upstream from the Wilderness boundary) on your trip? (Circle one number; please leave blank if you did not visit this stretch of river)

1	2	3	4	5	6	7	8	9	
not at all crowded		lightly crowded					moderately crowded		extremely crowded

12. In general, how crowded was the lower river (downstream from the Wilderness boundary) on your trip? (Circle one number; please leave blank if you did not visit this stretch of river)

1	2	3	4	5	6	7	8	9	
not at all crowded		slightly crowded					moderately crowded		extremely crowded

Section C. Type of Experience Questions

1. Please read these and choose the letter of the category that best describes the setting that you expected to find, the setting you actually experienced, and the setting you would have preferred on each river segment. The upper river is upstream from the Wilderness boundary (the upper 73 miles). The lower river is downstream from the Wilderness boundary (the lower 17 miles). Only answer for the sections you visited.

A. Primitive Recreation: Where one can expect to find solitude and very few traces of previous use. There is little or no development.

B. Semi-Primitive Recreation: Where one expects to meet a few other groups of users, but solitude is still possible, particularly at camps. You may see a few semi-permanent tent camps and traces of previous use at some sites.

C. Undeveloped Recreation: Where you expect to meet many other groups of users, and solitude is sometimes difficult to find. There are some semi permanent tent camps and traces of previous use at many sites.

	What I expected: (circle one letter)	What I actually experienced: (circle one letter)	What I would prefer: (circle one letter)
Kagati Lake	A B C	A B C	A B C
Upper river	A B C	A B C	A B C
Lower river	A B C	A B C	A B C

Section D. Impact Importance

1. Different impacts have different effects on peoples' trips. Please tell us the potential of the following to affect your enjoyment of the Kanektok, even if you didn't happen to see or experience it on this trip (please check on box for each item)

	Doesn't matter	Annoying, but only if frequent	Annoying, even if infrequent	Can ruin the trip
Seeing litter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seeing unburied human waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Camping within sight/sound of other groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seeing other groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competition for campsites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competition for fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Number of permanent camps/structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encounters with float groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encounters with sport anglers in motor boats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encounters with local villagers in motor boats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seeing airplanes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seeing helicopters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
See other large groups (over 8 people)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seeing other groups with many boats (over 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Did the actions of another group or person not in your own group negatively affect your trip?

- No
- Yes

Please explain: _____

Section E. Questions About Impacts

1. For each of the following impacts, please estimate the amount you experienced or saw on your most recent trip, and then estimate the amount you would accept or tolerate before your trip would be compromised.

Example: If you encountered about three other parties a day on the upper river (upstream from the Wilderness boundary), you would write "3" under the "amount you experienced or saw." If you felt this was too many and you could only see about two other groups per day before your trip was compromised, you would check the box and then write "2" under "amount you would accept or tolerate."

	Amount you experienced or saw	Check if you saw more than you expected	Amount you would accept or tolerate
Average number of encounters with floating groups per day:			
at Kagati Lake	_____	<input type="checkbox"/>	_____
on the upper river (upper 73 miles)	_____	<input type="checkbox"/>	_____
on the lower river (lower 17 miles)	_____	<input type="checkbox"/>	_____
Average number of encounters with motorboats per day:			
on the upper river	_____	<input type="checkbox"/>	_____
on the lower river	_____	<input type="checkbox"/>	_____
Number of structures (wall tents, weatherports, cabins, fish drying racks, etc.) you saw per day:			
on the upper river	_____	<input type="checkbox"/>	_____
on the lower river	_____	<input type="checkbox"/>	_____

Section F. Questions About Impacts (continued)

1. For each of the following impacts, please estimate the amount you experienced or saw on your trip and then estimate the amount you would accept or tolerate before your trip would be compromised. These questions ask about percentages. Please round your estimates to the nearest tenth (for example: 0, 10, 20.... 80, 90, 100).

Example: If you took a 10-day trip and camped within sight or sound of other groups on 3 nights, you would write "30" for the "percent you experienced." If you felt that you could have spent a couple of more nights camped near another group, you could write "50" for the percent you would accept or tolerate."

	Percent you experienced or saw	Check if you saw more than you expected	Percent you would accept or tolerate
Percent of nights you camped within sight or sound of other groups	_____	<input type="checkbox"/>	_____
Percent of sites with litter	_____	<input type="checkbox"/>	_____
Percent of sites with human waste impacts	_____	<input type="checkbox"/>	_____
Percent of times you passed up fishing areas that you would have liked to use except they were occupied	_____	<input type="checkbox"/>	_____
Percent of times you passed up campsites that you would have liked to use except they were occupied	_____	<input type="checkbox"/>	_____
Percent of time you were in sight or sound of other groups of people on the river	_____	<input type="checkbox"/>	_____

Section G. Opinion Toward Management Strategies

1. The following questions ask for your opinion toward management strategies that might be used to help reduce impacts. These strategies have been mentioned by the public or have been utilized on other rivers in Alaska or the Lower 48. No decisions have been made to implement any strategy. We are interested in what you think of them. (Please check one box for each item.)

	Strongly support	Support but not a priority	Neutral/ not sure	Oppose but could be acceptable	Strongly oppose
Limit the number of private float trips allowed (guided users are already limited)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Limit the number of private float trips allowed during king and silver seasons only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Require private floaters to have permits but do not limit the number	<input type="checkbox"/>				
Build toilets in some high use areas	<input type="checkbox"/>				
Require float parties to carry out all human waste	<input type="checkbox"/>				
Enforcement of existing regulations	<input type="checkbox"/>				
Limit the size of motorboats	<input type="checkbox"/>				
Limit horsepower of motorboats	<input type="checkbox"/>				
Provide safety information to both motor boaters and floaters	<input type="checkbox"/>				
Increase information about minimum impact practices	<input type="checkbox"/>				
Expand river clean-up efforts	<input type="checkbox"/>				
Change fishing regulations to: _____	<input type="checkbox"/>				
Other: _____	<input type="checkbox"/>				

Section H. Opinion Toward Limiting Float Use

Since 1991, the Togiak Refuge has limited the number of guides and their clients who can visit the upper Kanektok. We would like to know more about your attitudes toward the possible limits on non-guided floaters.

1. Do you feel that limits are needed on the number of non-guided float trips on the Kanektok? (please check one)

- Yes, limits are needed to lower the current level of use
- Yes, limits are needed to keep use at about the current level
- No limits are needed now, but should be imposed in the future if and when overuse occurs
- No limits on non-guided use should ever be implemented
- Not sure; would need more information

2. If a permit system were implemented to limit non-guided float use,, how should permits be made available? (please check one)

- First-come, first-served reservation system
- Lottery system (everyone has an equal chance of being selected) with waiting list
- Other: _____
- Not sure; would need more information

3. Please check the box that shows your opinion about limits on non-guided float use on the Kanektok.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
Limiting non-guided float use would make for a better experience	<input type="checkbox"/>				
I would be willing to give up some of my chance to access the Kanektok in return for a better trip when I do go	<input type="checkbox"/>				
I would be able to find a way to float the Kanektok even if permits were limited	<input type="checkbox"/>				
If guided visitors are limited then non-guided visitors should be limited	<input type="checkbox"/>				
I would support a limited permit system if I was convinced it would improve locals' subsistence use	<input type="checkbox"/>				

Finally, we have a few questions for statistical purposes:

1. What is your sex? Male Female

2. How old are you? _____ years old

3. What is the highest level of education you have completed? (Please check one)

- | | |
|---|---|
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Finished high school |
| <input type="checkbox"/> Some college | <input type="checkbox"/> Finished college |
| <input type="checkbox"/> Some post-graduate | <input type="checkbox"/> Graduate degree |

4. What is your zip code? _____

Is there anything else you'd like to tell us about your trip or how you feel the Kanektok should be managed in the future?

Thanks for your help!

Public reporting burden for this collection of information is estimated to average 20 minutes per response, including time needed for reviewing instructions, searching existing data sources, gathering and maintaining data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington D.C. 20250 and to the Office of Management and Budget, Paperwork Reduction Project (OMB#0596-0108), Washington DC 20503.

Appendix C
Response to Public Comment on the Draft Public Use
Management Plan

C. Response to Public Comment on the Public Use Management Plan

C.1 Introduction

This appendix provides summaries and responses for public comments received during the public comment period for the Draft Togiak National Wildlife Refuge Comprehensive Conservation Plan and Public Use Management Plan which were published together. This input was provided through public review of the document and at community meetings.

Fifty written comments were received on the two plans, 32 of which were from Alaska. Comments were received from 9 commercial guides, The Wilderness Society, Wilderness Watch, the Sierra Club, Native Village Councils of Kwinhagak and Goodnews Bay, the State of Alaska; and 35 individual citizens. Public meetings were held in Quinhagak, Goodnews Bay, Togiak, and Anchorage, resulting in 13 response handouts returned with public comments. The comments were reviewed and separated into those that dealt with the Comprehensive Conservation Plan and those that dealt with the Public Use Management Plan. The comments presented here relate only to the PUMP. Some of the comments represent the stated opinions of the commentor and are acknowledged as such. Other comments pose questions, ask for clarification, or request changes to the document. Agency responses are provided for those comments.

All comments have been organized by relevant subject. Comments that were unique on specific issues have been addressed individually and those that were of similar content from multiple respondents were consolidated and summarized.

C.2 Public Use Management Plan Introduction

1). We are aware that the normal public involvement process on a plan of this nature may not reach all affected constituents on an equitable basis. For example, the Refuge has good communication opportunities with local communities and commercial operators, but the unguided users are much harder to reach and are not as likely to be represented by organized stakeholder groups. Unguided users (past and future) are by definition dispersed and less likely to be aware that this planning process is underway. Yet they are the segment of the public that will be most affected by the use limits proposed in this plan. Since unguided users will almost certainly be under-represented in public comments, we request that this fact be given ample consideration as those comments are analyzed.

Response: *Each comment is evaluated and considered based on its merits rather than the number of times a comment is made. We understand that some groups are more difficult to engage in a planning process and we make efforts to reach out to them in our public involvement efforts.*

2). Refuge Purposes: Based on the second sentence in the first introductory paragraph on page 1-10, the last purpose under 1.5.1 on page 1-11 is inadvertently attributed as a direct ANILCA purpose in Section 303 (especially since the previous ANILCA purpose is not numbered). We request this last purpose be correctly attributed to Section 2(a) of the Wilderness Act.

Response: *The text has been revised to cite the Wilderness Act.*

3). Page 1-4, 1.3.3 [of the draft PUMP], Goal 2: To be consistent with the Goal as represented in the CCP on pages 1-11 and 2-5, please revise to "Provide quality fish and wildlife oriented recreation, ... "

Response: *The text has been revised to be consistent with the CCP.*

4). Page 1-5, 1.4, State of Alaska Coordination: This paragraph, which appears as standard language in other [plans], acknowledges that DNR manages "the state's water and land interests within and adjacent to the Refuge." In light of the applicability and clear language within the State's SULD regarding navigable waters specific to the Togiak Refuge, we request this section additionally clarify that state management direction in Appendix C applies to the beds of all navigable waters in the Togiak Refuge and to the lower Goodnews River.

Response: *The text has been revised to be consistent with the CCP.*

5). Page 1-7, 1.6.1.1 [of the draft PUMP], second full paragraph, second sentence: We suggest revising this sentence to read: "Some local community members view this common form of angling as disrespectful and inappropriate. These local anglers . . ." Local viewpoints appear to be slowly changing and more people are increasingly tolerant of catch-and-release fishing as an effective conservation practice. We recognize that the cultural beliefs concerning catch-and-release are still an issue for some, but the PUMP should avoid the implication that this remains a consensus local view without definitive contemporary analysis.

Response: *Comment noted. We do not believe that the text portrays this view as a consensus. Issues described in this section were not addressed in the alternatives, so additional analysis is not necessary for this PUMP.*

6). Page 1-10 [of the draft PUMP], 1.6.1.6, Camping Opportunities: We request this section clarify that the State's Special Use Lands camping requirements apply to the beds of all navigable water-bodies in the Togiak Refuge as well as the lower Goodnews River below the refuge boundary as shown on the map accompanying the SULD.

Response: *The text has been revised to be consistent with the CCP.*

7) Page 1-11 [of the draft PUMP], Issue 2, second paragraph, first 2 sentences: While the Refuge may have taken certain outreach efforts to protect wilderness values, we do not believe that the only tool remaining is implementation of unguided use limits. The Refuge does not have a functional outreach program at the put-in points of Dillingham, Bethel or the lakes. No visitor center exists in Dillingham if visitors do happen to stay there for any period of time. River Rangers primarily operate on the lower rivers and only sporadically contact visitors. Without highly functioning processes such as these to disseminate information, it is questionable that the Refuge has done all it can to alleviate perceived impacts.

Response: *The refuge is committed to implementing measures that maintain and protect wilderness values. Much of the outreach to implement these measures must occur prior to the visitor's arrival in Dillingham or Bethel. The refuge has a functioning and effective web site with appropriate information. River rangers currently spend approximately 50% of their time on the upper portions of the subject rivers and this is expected to increase in future years. A visitor contact station is planned for construction in Dillingham in cooperation with the Wood-Tikchik State Park that will provide appropriate information. Finally, the refuge is committed to establishing a voluntary registration process prior to implementing use permits. This voluntary registration process will allow visitors to view float start dates and may assist in achieving objectives. In combination, many efforts to disseminate information are taking place or planned prior to imposition of use limits.*

8). Page 1-11, [of the draft PUMP], Issue 2, first paragraph, last sentence: This sentence appears to imply that subsistence users believe they have a priority claim over certain use areas. This kind of public concern merits clarification in the document. All refuge lands are open to all members of the public regardless of their chosen compatible activity, unless specifically restricted by state or federal regulation.

Response: *This statement is only intended to describe concerns expressed by local residents during the planning process. Subsistence users do not have a priority claim over certain use areas. No change was made to the text.*

9). Page 1-11 [of the draft PUMP], Issue 2, second paragraph, fourth and fifth sentences: We question the intent and rationale behind two of the issues that underpin proposed actions in the PUMP, including "availability of preferred fish species" and "equity of opportunity." By availability of preferred fish species (which is not defined) our understanding is that this relates to the need to pass fishing sites due to others occupying the location. While there was a close tolerance for this in the survey, we note that on the Kanektok, Goodnews and Togiak Rivers 86%, 88% and 82%, respectively, of the respondents to the survey reported that they found un-crowded fishing conditions. On both the Goodnews and Togiak rivers 88% of respondents and 86% of Kanektok respondents agreed there was minimal conflict with other visitors. With this in mind, we question the rationale of availability of fish species" for use as a resource based factor.

Response: *This section has been reworded. The resource and social factors analyzed are described more fully in Chapter 4 of the final environmental assessment.*

10). (Page 1-11, Issue 3) We are also unsure how "equity of opportunity" is defined or standardized, whether it relates to having a choice between guided and unguided use, or if it refers to opportunities to pursue an individual preferred experience (i.e., solitude). If this criterion is to be applied towards establishing objectives, the final plan should clarify what is being measured and its applicability.

Response: *See previous response.*

11) The frequent over-flights, motorboat noise, crowding at popular fishing spots and campsites, and increased encounters on the rivers occasioned by these transient recreationists make it imperative that the USFWS be vigilant and proactive in their enforcement of the laws and regulations governing this Refuge.

Response: *No response necessary.*

12) Would like to see Refuge Staff reside on the Goodnews River during summer or check the river often.

Response: *Several efforts to monitor use and provide information have been tried over the past 15 years, including maintaining staff at Goodnews Lake, maintaining a river ranger camp on the river, conducting patrols based out of Goodnews Bay in cooperation with the tribal council, and conducting floats similar to that of visitors. Each has different benefits. The refuge plans to continue to dedicate sufficient staff to the Goodnews River to monitor use and impacts.*

13) THE FIRST MANDATE IS TO PROTECT. THAT MEANS PROTECT EVERY SINGLE BIT OF GRASS, EVERY ANIMAL, ETC. OUR CHILDREN DESERVE NO LESS.

Response: *No response necessary.*

C.3 Alternatives Considered but Eliminated from Further Consideration:

1) Page 2-2, 2.2.2, Alternatives Considered but Eliminated, last two paragraphs: We remain disappointed that the Refuge has elected to forego further consideration of commercial guided recreational use on coastal rivers, which includes but is not wholly exclusive to, the Matogak and Osviak rivers. In our view there is sufficient justification to consider the authorization of guided use on a case-by-case basis in additional streams and rivers within the refuge, or at least not dismiss consideration in the future. We are aware of one request for a recreational guiding permit for certain coastal streams in the Togiak Bay area. While the commercial operator who submitted that permit later withdrew it, he noted that he did not believe that the consideration should be precluded in the future if others were interested, particularly local area villagers. Such use could contribute to the local economy and compatible priority recreational public use (fishing) of the reuge. We are also aware of specific inquiries to the Dillingham ADF&G office for commercial recreational guiding use of the Osviak River, particularly for coho fishing. While there may not be an overwhelming desire for use of these areas, there is some demand and their consideration, on a case-by-case basis, should be retained.

Response: *The 1991 Togiak NWR Public Use Management Plan identified the management direction for Unit No. 6, identified as the Three Rivers (Osviak, Matogak, and Quigmy). The management direction at that time was as follows: Protect and maintain habitat for the discrete anadromous fish runs. Emphasis on maintaining subsistence opportunities.*

This management direction, which takes into consideration the access, private lands, subsistence use, and demand, remains valid today. The subject rivers, along with other coastal rivers, are available for subsistence use and non-commercial recreational use. Commercial air-taxi operators can also access the areas with clients. The Service believes that reasonable opportunities exist for commercial sport fish guiding within the refuge at this time.

C.3 Public Use Management Plan Jurisdiction:

1). Several respondents favored limits on access, numbers, and frequency of boating use on the lower Kanektok river, with monitoring and regulation imposed on motorized use.

Response: *The Service owns no uplands along the lower river. Actions to manage use on the lower river are beyond the scope of this plan.*

2). Many comments were made to request regulation on motor boats; allowing only crafts on the rivers with engines smaller than 40 hp, and implementing new emission standards.

Response: *Regulation of motor boat engine size is beyond the scope of this plan.*

3). Regulation of unguided use on navigable water-bodies is not consistent with ANILCA Section 103(c). Section 103(c) provides in part: "No lands which, before, on, or after the date of enactment of this Act, are conveyed to the State, to any Native Corporation, or to any private party shall be subject to the regulations applicable solely to public lands within such units." The Submerged Lands Act of 1953, applicable to Alaska through the Alaska Statehood Act, grants "(1) title to and ownership of the lands beneath navigable waters within the boundaries of their respective States, and the natural resources within such lands and waters, [including specifically "fish"] and (2) the right and power to manage, administer, lease, develop, and use the said lands and natural resources all in accordance with applicable State law." The primary purpose of the proposed regulation limiting unguided use appears to be reducing the number, and particular class, of persons, including Alaska residents, traveling and utilizing the State's navigable waters and resources "in accordance with applicable State law" -contrary to Section 103(c), other applicable law, and the broader public interest.

4) The PUMP does not justify refuge control of navigable waterbodies.

This plan portrays the unguided use permit system as a limit on refuge uplands; however, as noted above, the clear intent and effect is to prohibit selected public use of the affected rivers themselves. In order for the Refuge to seek to control, limit and effectively prohibit general public use of a state-owned navigable water-body, the Refuge must first demonstrate a real nexus between that level of use and actual or reasonably certain adverse impacts on refuge uplands, which can be remedied only in the manner proposed. The State holds a sovereign public trust authority and responsibility to manage and control its navigable waterways for the public use and benefit, including the public right of travel. A nexus must be very compelling in any attempt to justify defeating this sovereign authority, and should be asserted sparingly, if at all. The State strongly opposes any implied or asserted nexus on the Togiak Refuge, since the level of use is still low. The activity proposed for limitation and prohibition by federal regulation is float trips for fishing and access by the public - in particular those who cannot afford or choose not to pay for a guided trip. Use of refuge uplands are only incidental to this activity, and the Refuge can be protected by other, less intrusive means.

5) We also note here the very significant fact that the "plan proposes actions to manage the level and frequency of recreational use on Refuge administered lands through either indirect or direct action."

However, it does not note that the primary effect would be to limit public access to state lands and waters. This is a very significant issue that is not recognized in the document.

Response to comments 3-5: The actions proposed in this plan are based on the use of uplands within the management of the Togiak Refuge.

C.4 Public Use Management Plan Direction and Alternatives

C.4.1 Summarized Comments:

Support for a specific alternative or an alternative relative to a specific issue:

1) A majority of respondents preferred alternative “C” as the plan to adopt for the PUMP.

(Nine comments for C, two for A, and one for D and E)

Response: Comment noted.

2) Many commentators saw a need for more restrictions or complete elimination of motor boat use on waters in the Refuge.

Response: Comment noted.

3) Several comments were in favor of implementing management policies that increased public use and facilities in high use areas, including waste facilities and visitor contact facilities.

Response: Comment noted.

4) Comments also focused on approval for the idea of setting limits on both commercial and private use of the river systems in an equitable and sustainable manner.

Response: Comment noted.

5) Support was voiced for management approaches with a primary focus on benefiting wilderness areas and habitat health. Maintaining the solitude and scenic aesthetics of untrammeled wilderness was a priority for these commentators.

Response: Comment noted.

6) More monitoring and oversight of rivers and use by permitting systems was requested in several comments.

Response: Comment noted.

7) Several supporters of the preferred alternative, while in support of the alternative, felt that the plan needed more restrictions on both commercial and non commercial river use.

Response: Comment noted.

8) Some respondents specifically felt that alternative D was an unsatisfactory approach due to its increase of human use and perceived impacts on natural environment.

Response: *Comment noted.*

9) Restrictions on aircraft access was a priority for respondents as well. People were opposed to fly-in day trip access on the refuge, as well as prohibiting helicopter use.

Response: *Comment noted.*

10) [Issue One Management of Cape Peirce]:

C held the most support with four comments in approval, and alternative A having one comment of support

Response: *Comment noted.*

11) Issue Two Unguided opportunities:

E was the preferred Alternative with six comments for it, C was also heavily liked with five positive

Response: *Comment noted.*

12) [Issue Three.(Waste management)]:

A similar distribution of preference was given to options A, B, and C, with B having one more comment of preference over A and C (three, four, and three endorsements respectively). E was supported by one respondent.

13) The need to implement an improved education and outreach program focusing on waste management and water quality, restrictions on use, and use opportunities was a concern for commentators. Maps showing use areas, health education and monitoring/enforcement approaches were suggested as areas to focus development on.

14) We appreciate that the Preferred Alternative seeks to develop a monitoring process to select indicators to deal with human waste issues. We are concerned, however, that a voluntary packout program is offered as the only alternative to a mandatory pack-out program, particularly in light of the absence of existing or potential resource impairment. Use of other adaptive management strategies, such as increased education and enforcement, may suffice. We understand that visitors have low tolerances for human waste (and litter). This is a universal standard across the recreational spectrum. However, it is more appropriate to increase education, promote better waste disposal techniques, and implement standards and indicators through a cooperative LAC-type process before implementing a mandatory pack-out program.

Response to comments 12-14: *The alternatives have been revised somewhat to respond to comments on the draft plan. We believe that they continue to represent the same range of actions, are better aligned with the other actions in each alternative and also respond to advances in waste management technology*

15) Page 2-7, 2.2.4.4, Human Waste Management, second bullet: We suggest adding "other private landowners" (e.g., allotment holders) to the list of entities that could assist with various aspects of this issue.

Response: *This change has been made.*

16) Page 2-10, Issue 3, first paragraph, second sentence: State regulations require a separation distance of 100 feet measured horizontally from the mean high water level, not as measured from "surface water" (18 AAC 72.020(b)). An implied refuge requirement relating to the distance from surface waters may create confusion for the public and would be in conflict with the SULD and state law. This issue needs to be clarified in the final plan. This also applies to Table 2-3.

Response: *The text has been changed.*

17) Safety, environmental, and public health concerns were motives for respondents to recommend packing out all waste products. Many of these comments had subtending concerns on the need of more studies to determine environmental impacts and more monitoring of water quality, particularly near camping facilities and in high use areas.

Response: *These concerns are addressed in the alternatives as well as in the Management Direction Common to All Action Alternatives.*

18) The need to implement an improved education and outreach program focusing on waste management and water quality, restrictions on use, and use opportunities was a concern for commentators. Maps showing use areas, health education and monitoring/enforcement approaches were suggested as areas to focus development on.

Response: *No response necessary.*

19) Safety, environmental, and public health concerns were motives for respondents to recommend packing out all waste products. Many of these comments had subtending concerns on the need of more studies to determine environmental impacts and more monitoring of water quality, particularly near camping facilities and in high use areas.

Response: *No response necessary.*

[Issue Four Additional guiding opportunities]:

20) A large majority of respondents (seven) preferred alternative C for this issue, with two respondents in favor of approach D and one for approach A.

Response: *No response necessary.*

21) Respondent desires more flexibility in permits issued for guided use to ensure fairness for smaller guide businesses to compete with larger outfits. They also wanted allowance of yearly registration with more flexibility to select travel on different river systems.

Response: *The process for issuing commercial sport fishing permits does not differentiate based on the size of the business. Rather, selection is made on the basis of factors such as history of conducting similar activities, knowledge of the area, safety record, record of fish and game violations, and overall operations plans. The refuge feels that fairness exists regarding business size. Although the permit issuance system in place does not allow the flexibility to select different river systems each year, it does provide other benefits such as stability of operations, the ability to transfer business permits, and reasonable ease of administration. The refuge believes that this system, which is used successfully on refuges throughout the state to administer big game guided hunting, is fair and reasonable.*

22) Several comments supported the reduction in the number of commercial permits distributed to visitors.

Response: *The number of commercial sport fish permits issued for the refuge, with the exception of the Goodnews River, was established in the Togiak Refuge 1991 Public Use Management Plan. The refuge continues to believe that the 1991 plan provides reasonable direction for commercial use on the refuge.*

23) Many respondents sought for more than one opportunity or allowed use of commercial motor boating beyond what is currently proposed

Response: *The refuge believes that the proposed levels of use strike a reasonable balance between commercial motorized use and non motorized use, and the goal of maintaining the wilderness character.*

C.5 Specific Comments:

1) We request that the final plan identify how these safety considerations, if they exist, will be addressed by the Refuge. If safety issues are a genuine concern, we recommend consulting with the U.S. Coast Guard to address this problem and to identify where, if anywhere, Navigation Rules should apply, and the appropriate rules or regulations then put into place. We appreciate the Refuge's stated commitment to working with the State and the Coast Guard ("partners") to identify and address public safety issues on rivers within the refuge, as appropriate.

Response: *As stated in the draft plan, the Service has no management authority over boating safety of the general public on these waterways. That is why it was not addressed in this plan.*

2) Page 2-4, 2.2.4.3 [of the draft plan], Wilderness Lakes: The title of this section is misleading. Since the Togiak Refuge is not a pre-Statehood refuge (at least not the parts within management units 13a and 13b), it is not appropriate to imply that the lakes themselves are designated as Wilderness since most if not all are likely navigable and thus state-owned. We suggest "Lakes within Wilderness" as an alternative.

Response: *Wilderness Lakes is the name of the management unit described in the 1991 Public Use Management Plan. The management direction applies to lakes within the boundaries of the Togiak Wilderness, but does not imply any particular land status. Management of lakes and shorelands which become state-owned would be covered by the SULD. Management direction of the Wilderness Lakes Unit was not included in this revision.*

3) Discontinue authorization of commercially provided “day visits” to lakes in the Togiak Wilderness, or reduce such visits to the 1980 level.

Response: *The number of commercial sport fish permits issued for the refuge, including the day visits to wilderness lakes, was established in the Togiak Refuge 1991 Public Use Management Plan. The refuge continues to believe that the 1991 Plan provides reasonable direction for commercial use on the refuge.*

4) Page 2-8, 2.2.4.5 [of the draft plan], first partial paragraph, first partial sentence: The Special Use Lands Designation for the State establishes that camps must be moved two miles to start another time period. If refuge regulations are to be aligned with State of Alaska regulations for the SULD Area, as stated, we request that the Refuge also consider applying a minimum relocation distance of two miles between three-day periods.

Response: *It is the intention of the Service to promulgate camping regulations which are aligned with the SULD. We have adjusted the plan to reflect the two mile move requirement.*

5) Fully protect the lower Goodnews River, Kagati Lake, and Pagati Lake.

Response: *It is the intention of the Service to protect all refuge lands. The lower Goodnews River is outside of the Togiak Refuge boundary.*

6) Page 2-7, 2.2.4.5, Camping Opportunities on State Lands within the Togiak Refuge Boundary and along the lower Goodnews River: At the end of the third sentence please add “Special Use Land Designation” for clarification.

Also, this section discusses the camping limits on “state lands” but does not explicitly clarify this applies to the beds of navigable waterbodies. We request such a clarification in the first full paragraph on page 2-8.

Response: *The reference to the SULD has been added. The section is intended to refer to any State owned lands. We feel that to specify certain types of lands would be more confusing.*

7) The proposed refuge camping limits would only apply to areas within one quarter mile of the Kanektok and Goodnews Rivers, but does not include the Togiak River. Is this an intentional deviation when the intent is to “bring it into alignment” with state rules?

Response: *This is an error in the draft plan revision. The text has been revised.*

8) Page 2-8, 2.2.4.5 [of the draft plan], second full paragraph: This section states that the Refuge will relay information about trespass, but does not say to whom (e.g., the State Troopers? landowners?).

Response: *This section of the plan has been clarified. Information on trespass will be relayed to the land owner, manager or entity with trust oversight.*

9) Page 2-8, 2.2.4.5 [of the draft plan], first partial paragraph, last sentence: We question the Refuge's ability to apply camping restrictions to all users except for qualifying federal subsistence users. Under Federal Subsistence regulations, the Refuge may have some ability to regulate take based on residence;

but we are not aware of the authority to regulate camping on public lands based on residency. This action would also be inconsistent with the State SULD. Further analysis is advised.

Response: *The section has been revised to reflect that camping restrictions will apply to all river users.*

10) Page 2-18, 2.2.6.9 [of the draft plan]: Please clarify in the final plan that these motorized use permits are guided use permits, as is done for both the preceding systems in Issue 4. Although the overarching heading is "Commercial Sport Fishing" the explicit omission for the Togiak River section may take on unintended meaning.

Response: *The text has been clarified.*

11) Page 2-9, 2.2.5.3 [of the draft plan]: We are concerned that this type of set-up (a permit application period) may potentially lead to one operator being able to control all the permits. Please clarify, here and elsewhere, if the commercial operator will be the party applying for and holding permits or if it will be the guided user.

Response: *The text of the plan has been revised to clarify who will apply for the permits under each alternative.*

12) The need to refine the commercial permitting approach given in the preferred alternative was an issue for respondents. The permitting distribution was felt to need a better defined distribution mechanism to prevent monopolization of commercial permits by one company.

Response: *The details of the permitting process for both commercial guides and for individuals will be described during the promulgation of the implementing regulations.*

13) If guide opportunities are allowed to increase, care should be taken it does not interfere with subsistence uses. However, mere presence of guides and clients or what some might consider "esthetic" interference should not be the main issue if subsistence activities are still able to proceed, and target species can be acquired. Interference such as displacement, disruption of gear or target species, impacts on target species would constitute "real" interference to me.

Response: *Comment noted.*

14). • No unguided use limits now.

Response: *Comment noted.*

15). Page 2-19, Issue 2 Unguided Recreation Opportunities, Alternative C: This discussion applies limits of unguided float use to the "watershed" of the Kanektok and Goodnews rivers. We oppose these limits; however, if this concept is retained in any of the alternatives, we recommend replacing this term with "corridor" to clarify that the limits would be intended to apply to the main river corridors, not distant uplands or tiny headwater tributaries.

Response: *Regulations to be promulgated in response to the selected alternative will address the specifics of this comment.*

16) Page 2-57 [of the draft plan]: When the Service decides to regulate access for "crowding" it must come up with a clear and quantifiable definition for it and to publish this standard. Crowding is a highly subjective thing and is highly dependent upon the attitudes of individuals

Response: *The alternatives in this plan and environment assessment present a range of clear and quantifiable standards for use levels which we are considering for establishment.*

17). Page 2-27 [of the draft plan], Alternative E: Additional standardized monitoring is necessary to determine just where the human waste issue exists and what groups are responsible and whether the impacts are occurring on state or refuge lands. As Collins noted of Whittaker 1996, (Togiak Recreational Summary, Collins 2001 unpublished), River Rangers collect campsite impact information about visitors contacts. "The information is not readily quantifiable to suggest impact or incident trends on these rivers." Whittaker suggested that "a more systematic reporting system should be put in place to help translate this information into measurable variables." Collins reports that "Rangers are still collecting this type of information in the same ways. ... Information collected unsystematically and subjectively is limited in its usefulness. Here again the principles of planning frameworks such as LAC are very useful. By developing measurable indicators of resource conditions and establishing acceptable limits that those conditions will be allowed to reach, managers will have an objective monitoring system which will provide the basis for defensible management decisions." Collins reports that this has not been done and the plan itself does not provide information to show that such a program has since been implemented. Without implementation of a standardized monitoring system, as has been done cooperatively on the Gulkana River, support for unilateral management actions will be difficult to achieve. For the other alternatives, we request that future monitoring follow more rigorous protocols.

Response: *The Public Use Monitoring Plan which will be developed as a key implementation element is intended to provide a standardized monitoring system including the establishment of indicators and standards. It is the intent of the refuge to develop this plan in a cooperative manner with our partners.*

18) Page 2-28, 2.2.10 [of the draft plan], Summary Comparison, first paragraph: The assumptions consider that not all permitted guides utilize their allocations. The paragraph fails to note whether this is true for both guided rafting trips and guided motorized trips. Without this information, the implication is that some guided use segment could increase when that may not be so, so that the 63% use assumption is not necessarily correct.

Response: *The text has been clarified to note that commercial sport fishing guides – both rafting and motorized – do not utilize 100% of their permitted use. After reviewing past use for this analysis, we believe that a 63% use assumption fairly reflects current use and is valid for a comparison of alternatives.*

19) Page 2-31 [of the draft plan], Table 2-4. Commercial Sport Fishing Guide Alternatives: We appreciate that Alternative D provides opportunities for commercial guided use on the Osviak and Matogak rivers. Consistent with our comments on page 2-2 of the PUMP, we continue to support consideration, on a case-by-case basis, of such commercial use on all the coastal rivers. In this manner the Refuge may closely manage use, which is expected to be low, and provide additional opportunities for recreational use of the Refuge.

Response: *In this plan, the Service chose to consider the Osviak and Matogak rivers as the most likely of the coastal rivers to be opened for additional guiding opportunities. The prospectus process used to award guiding permits on the refuge does not lend itself to a case-by-case approach.*

20). Regarding Outboard Motors in the Wilderness. I strongly recommend phasing out outboard motor based sport fishing over time because of issues related to global climate change and the environmental effects of the myriad fuel spills associated with fueling & oiling engines in the river and riparian zone. I own and/ or operate 3 outboard powered river craft. I fuel them daily or more often in peak use periods. There are inevitable minor spillages with essentially every fueling and/or fuel transfer.

Specifically regarding Outboard Motors in the Wilderness I propose that the policy of allowing outboard guided motorized sport fishing be completely eliminated from the smaller tributaries of the Togiak including the Ongivinuk, Gechiak, Pungokopuk, Kemuk, Kashiak etc. Have we forgotten in the few decades since (ANILCA) when these sport fishing lodges were developed that for many years we walked up those tributaries on foot and had stunning fishing? Not only terrific fishing but the wilderness solitude that we came for. There is absolutely no economic reason for lodges & guides to NEED MOTORISED ACCESS in these small easily disrupted tributaries.

Response: *The 1991 PUMP which established management direction for this unit of the refuge directed the continuation of motor-boat based commercial sport fishing on the Togiak River within the wilderness area. We do not believe that it is necessary to eliminate this activity at this time and that issue is not addressed in this PUMP revision. All commercial recreational fish guides permitted guide in this unit addressed fuel handling procedures in their proposals and that is an element of the selection criteria. As a matter of practice, very little fuel is stored at these camps. The 1991 PUMP, nor the current PUMP address commercial sport fish use of the referenced tributary streams. It is not a routine practice to access significant portions of these streams by motorboat. In all but the highest water levels, access is restricted to lower sections of the river and therefore, use of these streams by commercial motorboat based fishing is limited.*

21) If the Service determines that restrictions on subsistence use of ORVs are necessary to protect refuge resources, we request clarification in the final plan that refuge-specific regulations will be promulgated based on a larger-scope study of all pre-ANILCA activities and access.

Response: *The Service is not aware of any subsistence use of ORV's on the refuge.*

22) We do not endorse Alternative C because we feel that there is a problem with the language of it. It would read better if the limits were set based on a maximum number of people rather than a maximum number of trips.

It is far better for the habitat to spread the people out on the river. For example it would be better to have four groups of 3 people (4 trips) spread out on the river than it would be to have one group of 12 people (one trip) bunched up on one area.

Response: *Protection of habitat is certainly a consideration in selection of the recommended alternative and overall management of the refuge. However, protection and maintenance of the visiting public's wilderness recreational experiences is also an important consideration. Encountering other groups can adversely affect the quality of these types of recreation experiences for some groups of river floaters. The purpose of the proposed limits on starts is to directly protect the recreation experiences by reducing the number of groups on the rivers at any one time, which reduces the likelihood of encountering a group different from one's own. Most likely, the proposed limits will also indirectly benefit the habitat by lowering potential biophysical impacts to the rivers, but these indirect benefits are not the primary purpose of the proposed limits.*

23) Page 3-55,3.5.6.1, [of the draft plan] Overview, second full paragraph: This description overstates the intent of the 1991 PUMP regarding the 50/50 allocation between guided and unguided use. The CCP says the PUMP "indicate[s] that long-term management should be directed toward a 50/50 allocation of guided and unguided use." However, in the original PUMP, this allocation "has only been used as a means to allocate guided use" (page 55, 1991 PUMP). Furthermore, page 35 of the original PUMP says that when unguided use reached 50%, "revision of the plan would begin." We are concerned about incorrect implications that the original PUMP assumed that unguided use restrictions would automatically be warranted when use reached 50%. Also see current revised PUMP language on page 1-1 (last line) to 1-2 (1" 6 lines), which calls for "additional analysis."

Response: *The 1991 PUMP states "Long-term management will be directed toward an allocation of 50 percent guided and 50 percent non-guided use" (p. 128). At present, the FWS believes that this is a legitimate standard that has been exceeded not only in proportion, but at levels in the past that jeopardized the quality of the visitor experience for some people. For these reasons, revision of the PUMP was begun, and the revised PUMP public planning process, including extensive public involvement and extensive State participation, provides the "additional analysis" to which you refer.*

24) We recommend Alternative C (Preferred Alternative) modified as follows:

i) Management Direction. Same as Alternative C: Facilitate wildlife viewing that complements the protection and preservation of the area's natural and cultural resource values. Cape Peirce wildlife viewing area and Sangor Lake are within the Service's 334,000-acre wilderness recommendation.

ii) Visitation. Alternative A: Maximum one flight per day and six people at one time combined with Alternative C's provision that a guide or refuge staff member may accompany visitors. Alternative C's up to two flights a day and 12 people at one time would offer less of a wilderness experience in this relatively small area in which public use focuses on walrus viewing at the haul-out beach and bird-watching on the nearby cliffs.

iii) Allocation. Alternative C: 50 percent commercially guided/ and 50 percent general public; unused permits available through a common pool.

iv). Facilities. Alternative C modified: Moderate facilities to accommodate as many as six people (i.e., one cabin, tent platform, and outhouse). A cabin would serve as emergency shelter and serve visitors who may be physically unable to camp out in the occasional severe weather of the Cape Pierce area.

Response: *Comment noted.*

25) Modify Alternate C use levels to be reduced from allowing 4 boat trips with 12 people, to 3 boat trips with 9 people.

Response: *A lower level of visitation is considered under Alternative E. The use level identified under Alternative C for unguided group sizes, would be in line with levels allowed for guided trips on the same rivers.*

26) See no need, based on recent use numbers, to limit unguided use/access levels.

Response: *Comment noted.*

27) [I] prefer to Alternative E instead of Alternative C because Alternative C proposal of allowing guided use and unguided use to be rotated every other day (one day guided, the following unguided) will result in

boat use occurring on the rivers everyday, which increases user cross contact and diminishes the wilderness experience.

Response: *Comment noted.*

28) Unguided recreational users contribute only 20% of lower river use. Private landowners themselves are in the best position to most effectively control use in the lower rivers. Should they choose to take steps to reduce use in this area, they can do so by refraining from leasing additional lands or implementing limits on commercial uses that take place on their lands.

Under the circumstances, we question the need for the Refuge to enact such stringent use limitations. The proposed standard limiting guided and unguided starts to one per day falls significantly below threshold encounter rates noted by visitors. We are aware of only two other rivers in the United States with such comparable use limitations -the Selway and the Alsek. Both of these rivers have different access issues than at the Togiak Refuge. Based on encounter rates, the survey supports at least three to four launches per day, not one launch per day.

Response: *The actions proposed in this plan are intended to address levels of use within the Togiak Wilderness, not on the lower river. However, we do take into consideration how actions taken by the refuge may affect adjoining land owners. The ability for lower river users (residents of the village of Quinhagak generally) to reduce use by “refraining from leasing additional lands or implementing limits on commercial uses that take place on their lands” presents challenges of working with multiple land owners. The Service maintains that it is necessary to have in place an option for limiting unguided recreational use when or if that use exceeds the threshold. The Service would not implement the proposed limits until the level of unguided use reached or exceeded the level of guided use.*

C.5.1 [Issue 4. Commercial Sport Fishing in the Goodnews, Osviak, Matogak, and Togiak River Watersheds Summarized Comments]:

1) A higher quality recreational opportunity could be offered by changing the float boat permits for commercial operators to allow 9 people in three boats per trip instead of the existing guideline of 8 people in two boats. This would allow three people per boat instead of four, and is the standard for every other Alternative for every other river in each of the proposed Alternatives. The impact of an additional person and boat would be negligible, three people to a raft is the standard in the industry, for safety and comfort.

Response: *The 1991 PUMP evaluated the commercial and subsistence use levels on the upper Togiak River. The allocation at that time, which is mirrored in the preferred alternative, justified the commercial sport fish allocations based on available fishing sites and potential interactions between sport and subsistence users. The Service feels that this justification remains valid and did not evaluate the alternative of adding a third boat to the float boat use on the Togiak River. The ability to achieve the high quality recreational opportunity being sought can still be done by limiting the group size to six rather than eight, though the Service understands that this has possible economic implications.*

2) Issue 2: Unguided recreation opportunities on the Kanektok: Although I am not involved currently with the Kanektok, I spent 3 years running a camp in the wilderness area. I think both public and commercial operators would benefit from a structured float use plan. I think all the alternatives except Alternative A would help the current situation. This would spread out the public use so they would have the fishing trip everyone is looking for. There were days on the Kanektok that we would run into 2-3

rafting groups all within a few miles of each other. This affected our clients' experience, but more importantly, I am sure the rafters did not have a good experience being so close to other groups.

Response: *Comment noted.*

3) I have no problem with the idea of giving the guided groups set dates on alternating days and giving the unguided groups the days in between the guided groups dates, as long as the number of days that are allocated to each group (guided and unguided) are equal. However, because there are several air taxi operators flying unguided groups into float the Kanektok a system must be established to reserve the available dates for the unguided groups and that system needs to be set up so someone cannot simply reserve a bunch of dates ahead of time. Also, because the guided operators get to pre-reserve their dates should they fail to use them the system should take those dates away from them and make it an open date for both the guided and unguided groups the following season.

Response: *Regulations to be promulgated in response to the selected alternative will address the specifics of this comment.*

4) Proposal of new alternate management for commercial sport fish guiding on the North Fork and Middle Fork on the Goodnews River. On the Middle Fork instead of one temp. camp and six people how about no temp. camp and six people.

Response: *Comment noted. A range of opportunities for sport fishing throughout the refuge have been provided that includes several temporary camps. This camp on the Middle Fork of the Goodnews River is the only one on the entire drainage and it is felt that this is reasonable.*

C.6 Affected Environment

All comments received on the Affected Environment chapter of the Draft Comprehensive Conservation Plan Revision and Draft Public Use Management Plan Revision were responded to in the final Comprehensive Conservation Plan revision. The Affected Environment chapter which is included in this final EA has been extracted from the final Comprehensive Conservation Plan.

C.7 Effects of PUMP on Subsistence and Local Residents

C.7.1 Summarized Comments:

1) Respondents wanted to ensure protection of all subsistence user opportunities, and to make consideration of subsistence uses have precedence over recreational use in management decisions.

Response: *The Togiak Refuge is committed to providing the continued opportunity for subsistence uses, which is one of the purposes of Togiak Refuge. The Refuge is also bound by the provisions of Title VIII of ANILCA as well.*

C.7.2 Specific Comments:

1) Sport anglers block salmon spawning streams with boats so there is no room for locals to fish – could lead to violence.

Response: *The Togiak Refuge is committed to providing the continued opportunity for subsistence uses, which is one of the purposes of Togiak Refuge. Although the refuge recognizes that the potential for conflict between user groups exists, we believe that a balance has been proposed that provides reasonable opportunities while minimizing potential conflicts.*

2) Make sure subsistence walrus hunting opportunities are protected.

Response: *The opportunity to harvest marine mammals is not impacted by this plan.*

3) Don't require walrus subsistence hunters to get a permit to go to Cape Peirce. Use from the village of Togiak is low anyway.

Response: *This issue and the alternatives presented, target the wildlife viewing opportunities at Cape Peirce. Wildlife viewers and subsistence walrus hunters are normally separated in time at Cape Peirce. There are no plans to require permits for subsistence hunters at this location.*

4) Educate Cape Peirce visitors about subsistence hunting there.

Response: *Information and education materials prepared by the refuge recognize the important role that subsistence plays in the lives of local residents. It is expected that any programs for visitors to Cape Peirce will also highlight this information.*

5) We are not completely happy with current use but can live with it – don't increase.

Response: *Comment noted.*

6) The plan attempts to consider the actual number of visitors over time and the potential for experiences to deteriorate over the life of the plan. The 2001 Survey suggested that the level of tolerances is close to being exceeded. However a review of both refuge and state data do not provide a compelling case for future growth. See also previous comment for page 3-58 in the CCP concerning use trends.

Response: *The Togiak Revised CCP shows that from 1990 to 2007, the overall trend in unguided use days for both the Kanektok and Goodnews rivers is increasing (USFWS 2009). Although annual variability, or fluctuation, in actual use days is likely to continue, the Service has no evidence to suggest that the overall increasing trend in unguided use on these rivers will not continue through the life of this plan. In addition, the Service has evidence that the Togiak Refuge is a desired destination among residents of Alaska. The Alaska Residents Statistics Program published a conservative estimate indicating that greater than 3,000 residents, age 18 and older, visited Togiak Refuge the year prior to the October 2006 – March 2007 survey period, and these residents came to the refuge from the interior, southwest, south central, and southeast regions of the state (Fix 2009). Although uncertainties exist, the Service anticipates future growth in visitation at Togiak Refuge during the life of this plan as the state and regional populations grow, both naturally and from migration to Alaska. There is also evidence in*

past trends that further migration to Alaska may occur in response to the economic downturn in the lower 48 states (Fried 2009).

Fix, P. J. 2009. Alaska Residents Statistics Program Final Report. Fairbanks, AK. University of Alaska Fairbanks, School of Natural Resources and Agricultural Sciences, Department of Resources Management. 285 p.

Fried, N. 2009. The U.S. economy and Alaska migration: A historical connection between the two. Alaska Economic Trends, 29 (6): 4-8.

7) Regarding encounters with float groups. Meeting with 1-2 other float groups per day is manageable. The floaters just work it out amongst themselves where to camp etc. Beyond 1-2 per day it becomes a problem and should be managed by permit.

Response: *Encountering another group (or groups) of floaters during a backcountry trip of this nature and having to negotiate camping spots with that group (or groups) each night can negatively impact the experience of some groups. The Service has developed a range of alternatives to address this issue. The Service's preferred action would require permits when a threshold is reached that will likely result in more encounters and a reduction in a wilderness experience.*

8) Page 4-3, 4.3.1.1, Kagati and Goodnews lakes, first full paragraph: The paragraph discusses that conditions and trends need to be established to determine what level of use these sites can support without lasting damage. The cooperative development of an expanded monitoring program we recommend would be advantageous to address these issues, especially since both refuge uplands and state-owned gravel bars would be addressed at the same time.

Response: *The Public Use Monitoring Plan would be developed under any of the action alternatives. The Service would develop and implement such a monitoring plan in close collaboration with the State of Alaska and its other partners.*

9) while the uplands are Wilderness, hardened campsites remain an available tool under rigorous circumstances. The headwater lakes as access points to the Kanektok and Goodnews rivers are bottlenecks. Due to weather or other circumstances, it is probably unavoidable that several groups will sometimes find themselves here at one time. It may be appropriate to consider hardening additional campsites to avoid visitor impacts to uplands.

Response: *Comment noted. The Service agrees that hardened campsites are an alternative. Considerations include, as noted, the wilderness designation of the site, plus the possible disturbance of cultural resources at the site. Nearly all use at these lake outlets is on durable surfaces. Rather than risk disturbance to cultural sites, we want to give the proposed actions a chance to see if they will alleviate displacement into more fragile upland campsites. More rigorous enforcement of existing camping limits could also help prevent the need for hardening. Hardening may be needed eventually, but once done the impacts are virtually impossible to reverse in these locations. Hardened campsites were not included in the alternatives in order to avoid those concerns.*

10) Page 4-7, Effects on Visitor Access, Alternative A: The footnote at the bottom of the page says "Because of the anomalous 2005 season, analyses in this chapter are based only on data collected through 2004." While we appreciate the Service's observations and opinions about the "anomalous" data, we request inclusion of the 2005 and 2006 data (and 2007 if possible) in the final plan so that the public may evaluate these numbers (and the reported anomalies) for themselves. Other factors (e.g. increasing fuel costs) may also be influencing the use trends.

Response: *The Service has included these data for 2005-2007 in Chapter 3. Affected Environment. The addition of this data reveals a continued upward trend. Additional analysis would not change the estimate of impacts and is not considered necessary.*

11) Pages 4-23 through 4-25 [of the draft plan] , 4.4.4, Alternatives B through E: The impact on local users of implementing human waste pack-out requirements also needs to be evaluated as it is a proposed action for all users.

Response: *The impact of human waste pack-out alternatives has been added to this section.*

12) Page 4-32, 4.4.7.1, Cumulative Effects, second full paragraph, last sentence: While flights to major travel hubs in Alaska can influence overall visitation to the state, they do not necessarily translate into increases to remote areas such as Togiak Refuge. With recent significant energy price increases, the cost of travel is increasing, especially in the Bush. This will likely translate to fewer visitors to remote areas.

Response: *The Service has no plans to implement the proposed limits when use remains low. The Service has rewritten this section to address this concern.*

13) Pages 4-15 to page 4-22, 4.4.3.1, Visitor Experiences: The assumption that visitors are using the area for a "wilderness fishing experience" is subjective and appears to be based on a partial interpretation of the 2001 survey. For example, "wilderness" is not defined in the 1995 or 2001 surveys. Without specifying what type of wilderness attributes the survey might be covering, respondents could not be aware if they are being asked about designated Wilderness (i.e. the upper rivers) or general wilderness values (e.g., natural place), which may be found in the region without regard to designation. We question whether many visitors are necessarily seeking a "wilderness fishing experience" as apparently defined by the Refuge. This is a subtle but important distinction. Fishing clearly rated highly in what visitors were seeking and the survey shows that visitors did find the quality of fishing they sought. Naturalness, solitude and wilderness rated lower on the scale but were still important.

Response: *The intent of this portion of the survey was to measure and document the relative importance of a set of attributes and experience dimensions that may be found at the Togiak Refuge for this group of respondents; these attributes were clearly spelled out in the survey. The intent of these survey items was not to determine if respondents know the difference between Congressionally-designated wilderness and a natural place that has wildland characteristics. These respondents travelled to a remote place for the purposes of fishing. Part of those trips occurred in an officially designated wilderness area. Moreover, a substantial number of the respondents reported that fishing, naturalness, solitude, and wilderness were important aspects of their trips to the Togiak Refuge. We consider this to be substantial evidence that these visitors were indeed seeking a "wilderness fishing experience" as defined in section 4.4.3.1.*

14) Pages 4-15 to page 4-22, 4.4.3.1, Visitor Experiences: The discussion notes that litter is an impact on the experience of visitors. While implementing public use limitations may reduce problems associated with litter and human waste, it does not prevent inappropriate disposal of litter or waste by individuals. We assert that increased education and information, coupled with enforcement, will do more to reduce these problems than public use limitations.

Response: *We agree that providing its visitors with information on appropriate behaviors at refuges is important and will continue at Togiak Refuge. With the advent of the Internet, "Leave-No-Trace" brochures are nearly ubiquitous and the River Ranger Program seems to have resulted in less litter and/or more compliance. However, we believe that increased education, information campaigns, and law enforcement are better suited for front country recreation situations than they are for remote backcountry wilderness environments. We believe that further ramping up such programs and increasing enforcement are inappropriate for this situation and may jeopardize the freedom and unconstrained type of visitor*

experiences that are now possible to enjoy while floating the upper segments of these rivers in the Togiak Refuge. We believe that measures to limit public access, while maintaining lower levels of law enforcement, fewer rules, and fewer information campaigns, are most appropriate for this recreation environment, activity, and situation. The issue of litter and human waste are a component of, and not the sole reasons for implementing public use limitations.

15) Page 4-3, 4.3.1.1 (cont.), last paragraph, second sentence: The assumption that use along the Goodnews River will "double within the first five years" is not substantiated. In section 4.4.2, Effects on Visitor Access, for Alternative E (the action alternative with the greatest level of unguided user limitation), the number of groups which may experience displacement as a result of limits is given as "few" to "some," with "four groups" experiencing immediate displacement. In Alternatives B and C, "a few" and "up to 2 groups" are estimated to be immediately displaced by imposed limits, respectively. Additionally, on page 4-36, unguided use on the Goodnews River is presented as "expected to continue near current levels with minor increases over time." The conclusion which can be drawn from these subsequent assessments is that use is not expected to go up during the life of the plan, let alone during the first five years, by any amount that would approach doubling. Please rectify this disparity in the final plan, or explain the conclusion that use on the Goodnews River will double by 2013 under Alternative D.

Response: *We anticipate that when the moratorium on more guided use than what is current on the Goodnews River is lifted that guided use will substantially increase in a relatively short period of time. We have revised this sentence in the text accordingly.*

16) Page 4-4, 4.3.2.1, first paragraph, second and third sentences: The implication that use "will increase" under Alternative C during non-peak periods because there will be no required permits is not supported, particularly since Alternatives A and D (which also do not require permits) do not imply this outcome. The first sentence states that the fishery is sustainable for Alternatives A and D; therefore it follows that the same would be true for Alternative C during the shoulder season. The fact that Alternative C provides limits where Alternatives A and D do not would indicate that less use would result overall, a condition the section appears to contradict.

Response: *It is our assumption that if use limits are imposed (as in Alternative C) for the peak periods, that some of that excess demand will shift to the non-peak periods. Alternative C would require permits during the peak salmon season unlike A and D that would not require permits for any season. We anticipate that since the peak salmon season would be limited to fewer anglers under Alternative C, there is potential for more demand to be created and more use realized during the non peak season during which more anglers would presumably be targeting rainbow trout and grayling.*

17) Under all alternatives there is little or no risk to fish populations on the waters within the Refuge as these populations are managed by ADF&G to maintain sustainable populations. If concerns exist about specific stocks of fish, as may be the case for Osviak rainbow trout, regulatory action can be taken to protect those stocks through either emergency regulatory action or through the Alaska Board of Fisheries.

Response: *Comment noted. The Service agrees that regulatory action through the Alaska Board of Fisheries is an important avenue to use should concerns exist about specific stocks of fish.*

18) The PUMP does not provide sufficient justification for the non-guided permit system and does not meet the standards for prohibition or restriction in the Alaska National Interest Lands Conservation Act (ANILCA) Section 1110(a).

Response: *We believe that the non-guided permit system is sufficiently justified in this document. We also believe that these actions, when promulgated into regulation, will constitute “reasonable regulations . . . to protect the natural and other values of the conservation system units” as stated in ANILCA 1110(a).*

19) Discussions scattered throughout the PUMP state or imply justification based on campsite conditions, availability of preferred fish species, opportunities for solitude, equity of opportunity, and protecting a "wilderness fishing experience." Most of these issues are not addressed in depth, and the offered rationale is neither compelling nor well-supported. Attention is placed on wilderness values, but the plan does not make an adequate case that wilderness values on refuge lands are, or will be, sufficiently harmed or impacted to warrant restriction of a public use and method of public access specifically protected by ANILCA. We also disagree with much of the analyses and conclusions. Assumptions used to support the unguided use limits are not supported by reliable, up-to-date data or appropriate analysis. The reporting and interpretation of the user surveys appears designed to favor the desired outcome. These concerns are supported in our general and page-specific comments on the PUMP.

20) Limits on unguided use on the Togiak Refuge are not warranted for the following reasons, in addition to those stated in the first three pages of these comments:

- Survey respondents reported un-crowded conditions and minimal conflicts with other anglers.
- Visitor use levels in the area are either stabilizing or dropping off according to both Service and ADF&G data.
- Visitors are currently accessing the rivers primarily for the fishing experience and are reporting that the experience they find is acceptable.
- Aesthetic values, such as natural settings and solitude, are not in jeopardy.
- Limits will not effectively address crowding at launch points after periods of bad weather.
- Limits will not be effective at all in the lower rivers due to the presence of many other unpermitted users.
- Limits are probably less effective in addressing litter and human waste than enforcement, education and voluntary measures.

Response to comments (19 and 20): *We have confidence in this analysis and in its objective interpretations of the various studies cited and reviewed. To protect the quality of the recreational experience on these rivers for the American public both today and into the future, we believe that it is necessary to consider having in place an option for limiting unguided recreational use when or if that use exceeds the threshold. Under Alternative C we would immediately initiate a public and open process to develop regulations that would implement the proposed actions. As a part of those regulations we would not implement the proposed limits until the level of unguided use reached or exceeded the level of guided use.*

21) The Service has finalized a definition of quality as described in recent planning efforts (February 2006, Revised CCP-EIS for Alaska Peninsula/Becharof Refuges, glossary page xxvi). One aspect of quality is the degree to which recreational opportunities and related experiences meet the objectives for which they are planned and managed, developed in consultation with the state fish and wildlife agencies and stakeholder input based on several criteria. Key among these is that the Service "uses visitor satisfaction to help define and evaluate programs." Given this criterion, and considering that the 2001

Survey shows that most people are visiting these rivers for the fishing opportunities they offer, and are satisfied with the experience, the Refuge's objectives can be met without restricting or prohibiting public access.

Response: *We have developed this Public Use Management Plan to address current and future visitation at Togiak Refuge. Currently, unguided use of these rivers follows an upward trend. We anticipate that this trend will continue during the life of this plan. We believe that it is necessary to have in place an option for limiting unguided use in the future if that use exceeds or matches that for guided trips on these rivers. The Service will monitor future visitor satisfaction using the Public Use Monitoring Plan that would be developed under any of the action alternatives. The premise that visitors visit these rivers for fishing opportunities and irrespective of the other factors being addressed in this plan is, in the Service's view, inaccurate. Although 92% of survey respondents rated fishing as "very important" or "extremely important", 80% rated "being in a natural place" and 73% rated "being in a wilderness" in the same categories. Relative to satisfaction with the experience, the survey indicates that on the Goodnews River, 43% of respondents reported that for the criteria "Fishing sites passed up" the conditions were either at the respondents tolerance threshold or exceeded their tolerance threshold. For the criteria "Nights near other groups, 45% of respondents reported the conditions were either at the respondents tolerance threshold or exceeded their tolerance threshold. Similar results are reported for the Kanektok River. This information, coupled with the fact that it is virtually impossible to accurately incorporate visitor satisfaction information for those users that have left the rivers because their tolerance threshold has already been exceeded, has led us to recommend an alternative for management that seeks to balance use with quality wilderness experience.*

22) [A] reduction in launches will cause displacement to other rivers within the region. Whittaker 1996 suggested that if a permit system were developed, displacement within the region should be considered. Except for Kanektok displacement to the Goodnews, the PUMP has not addressed regional displacement. We cannot be certain that those who would be denied access to rivers within the Togiak Refuge will not go elsewhere within the region, potentially creating new and unforeseen problems there.

Response: *Comment noted.*

23) Pages 3-56, Figure 3-10; and 3-58, Figure 3-12: The note preceding Figure 3-10 says that the trend "does not appear to deviate significantly from earlier trends." Yet the footnote on page 4-7 of the PUMP does not seem to be consistent with this statement. We request the final plan include more recent data.

Response: *The 2005 – 2007 data are now included in Chapter 3. The Affected Environment.*

24) Page 4-10 and 4-11, Footnotes concerning application of unguided limits: Both footnotes say that the use limits will only be applied under high-use conditions, presumably at the Refuge Manager's discretion. This discretion presents challenges for both the manager and the public. The method of allocation of permits to visitors has yet to be determined but will presumably be either a lottery or registration system. How soon ahead of the season would the decision be made to implement (or forego) the use limitations? Under what criteria would the decision be made? Could someone who entered a permit allocation system months in advance then find that it was not necessary? Would fees be returned? Additional information about this provision is necessary to evaluate its effects.

Response: *All of these concerns would be outlined in detail in the regulations that would be promulgated before implementation of the proposed limits on unguided use. The public would be provided opportunities to provide input and comments during the process used to set these regulations.*

25) Page 4-12,4.4.2.3 (cont.), first full paragraph on page: This evaluation neglects to consider the fact that, regardless of demand, there will be 100% displacement of groups larger than 3. Considering that it does not state 3 "clients," and if the guide were to count as 1, would this effectively apply to any client groups larger than 2? The negligible effect appears to be based on demand; however, the level of impact that may result from limits based on group size may be substantial and remains unaddressed.

Response: *This comment is accurate; there would be 100% displacement over the amount identified in the alternative. A range of alternatives was evaluated, all with a limit on commercial use on the Goodnews River that would have displaced 100% of commercial use over given amounts. The alternative would allow one boat with a guide and two clients to access the North Fork Goodnews River per day. The group size is an industry standard and the allowed amount is approximately 200% higher than demand over the last two decades, providing for substantial growth in this use.*

26) Page 4-12,4.4.2.3 (cont.), second full paragraph on page: We question the conclusion that a minor positive impact will result from the addition of a guided opportunity for the Middle Fork of the Goodnews River. According to Alternative A (page 4-8), there are inherent difficulties related to use on the Middle Fork, so additional opportunities may not result in any practical increase in opportunity. Additionally, Alternative D (page 4-13) states that this same opportunity will result in "negligible effects" due to the aforementioned challenges.

Response: *Despite the challenges, the Middle Fork of the Goodnews River is currently floated by unguided recreationists. Since this group is taking advantage of this opportunity, the Service anticipates that some guided groups would do the same. It follows that there would be some increase in use on the Middle Fork from the addition of this guided opportunity, and therefore a small positive effect on public access is probable. Under Alternative D, we changed "negligible effects" to "small positive effects."*

27) Page 4-14,4.4.2.5, Alternative E, displacement issues: While this section recognizes displacement to the Goodnews River, it does not discuss the regional impacts (within and outside refuge boundaries), which could be substantial.

Response: *The greatest impact is likely to be on the Goodnews River which is both close to the Kanektok and provides a similar experience. On a regional level, displacement spread among several river systems would have a lesser impact on each system than on the Goodnews River. This section has been changed to clarify the impacts.*

28) Page 4-15, 4.4.3.1, second paragraph, first sentence: We would appreciate clarification that "being in a wilderness" was not defined for surveyed parties as meaning Congressionally designated Wilderness. Parties taking the survey may easily have interpreted "being in a natural place" and "being in a wilderness" as equivalent or similar responses without such qualifying information. See also previous comments regarding wilderness values.

Response: *The Service does not claim that this survey item was intended to distinguish between being in Congressionally-designated wilderness or being in a natural place that may appear to have wilderness characteristics. The intent of this survey item is to measure and document the relative importance of a set of attributes and experience dimensions that can be found at the Togiak Refuge. Planners and managers at Togiak Refuge need to know for what reasons visitors take trips to these rivers to better inform visitor management; this was the purpose of these survey questions.*

29) Page 4-15, 4.4.3.1, second paragraph, last sentence: The definition of a "wilderness fishing experience" is not accompanied by a citation, so we assume it was created for the PUMP simply as an interpretation of the type of information presented in the paragraph. If so, we request this be clarified as this phrase takes on great significance throughout the document and, to our knowledge, does not have an official peer-reviewed definition.

Response: *In section 4.4.3.1, the Service is defining, for the reader, and in the context of the Togiak refuge, what it means by a "wilderness fishing experience," and the Service states that this definition is based on the study findings that are summarized in the paragraph. This definition was not paraphrased from a specific peer-reviewed citation, but it is supported by seminal work in fisheries management. Moeller and Engleken (1972) determined that a quality fishing experience includes the elements of water quality, natural beauty, and privacy. Water quality, natural beauty, and privacy are clearly related to being in a primitive natural setting with relatively few people or signs of people, and were reported to be more important to respondents' overall enjoyment of a fishing trip than either the size or the number of fish caught (Moeller and Engleken 1972). The Service has revised this section accordingly.*

Moeller, G. H., and Engleken, J. H. (1972). What fishermen look for in a fishing experience. Journal of Wildlife Management, 36(4): 1253-1257.

C.8 Public Use Management Plan Implementation

Page 2-4,2.2.4.1, Public Use Monitoring Plan: It seems fundamentally counterintuitive to initiate a Public Use Monitoring Plan after the decision to implement an unguided use permit system. The 1995 and 2001 surveys convey the understanding that there are some concerns about uses on the rivers, perceived or real. However, they were not designed as a Limits of Acceptable Change process, and are not accompanied by on-the-ground proofing of information and impacts; nor were they implemented with the cooperation of the partner agencies. [...] We highly recommend the Refuge work with its partner agencies to develop a more comprehensive step-down planning process instead of implementing public use restrictions at this time.

2) Work cooperatively with the State of Alaska to further define the issues of interest to the Refuge, the State and the public. The Service's proposed Public Use Monitoring Plan, excerpted here for reference, contains many of the elements of this endeavor.

Public Use Monitoring Plan

Due to the complex nature of public uses within the Refuge, a detailed system for measuring change over time is needed to evaluate the effectiveness of actions taken as outlined in this Comprehensive Conservation Plan. To accomplish this task, the Refuge will work with cooperators to identify important indicators of subsistence and wildlife-dependent recreational opportunities. The Public Use Monitoring Plan will also establish standards for each of these indicators needed to meet Refuge goals and objectives, along with management actions to be taken should these standards be threatened or exceeded. Techniques to be used for measuring indicators will be identified through this step-down plan.

If necessary, initiate a full Limits of Acceptable Change (LAC) process in cooperation with the State. A summary of how the LAC process works is attached, along with links for more information. We realize an LAC process requires a significant commitment of staff resources, and state agencies are prepared to engage as appropriate on survey design, public involvement, etc. We recently completed a successful LAC process with the Bureau of Land Management for the Gulkana River. We realize that Gulkana and

Togiak public use issues are in some ways different, but the LAC process itself is designed to be responsive to site specific circumstances.

For all phases of implementation, we encourage consideration of a broad array of tools -not just use limits. State tools, such as those already provided in DNR's Special Use Land Designation (SULD), can address many issues without triggering jurisdictional concerns. Use of the Board of Fisheries process is also available and does not carry some of the statutory constraints that guide DNR. While we recognize that some form of use limits might become an appropriate tool under very rigorous circumstances in the future, we do not envision a need for them and believe that mutually acceptable management objectives can be accomplished in other ways.

***Response to comments 1-2:** Although the Service did not formally establish an LAC process, we believe that management and planning for public use on rivers within the refuge were conducted in the spirit of LAC. Target levels of use were established in 1991 and this plan presents alternative approaches to managing within those targets. The Public Use Monitoring Plan process will establish indicators and standard for full implementation of this plan and subsequent regulations. The Service is always interested in working with partners to address management issues. In discussions with officials from various State of Alaska agencies and the Board of Fisheries, no alternative actions have come to light which address the management concerns of the Refuge.*

3) [I] desire a public use monitoring approach that is scientifically sound and verified by on site data collection to support data collected through other methods.

***Response:** That is the intention for the public use monitoring plan which would be developed with any of the action alternatives.*

Appendix D

Evaluation of Effects on Subsistence Opportunity ANILCA Section 810

ANILCA Section 810 Evaluation/Effects on Subsistence Opportunity

This evaluation was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It evaluates the potential impacts to subsistence activities that could result from the preferred public use management alternative that has been proposed for Togiak Refuge. Specifically, Section 810(a) of the Alaska Lands Act states:

In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public land under any provision of law authorizing such actions, the head of the Federal agency having primary jurisdiction over such lands or his designee shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes.

Chapter 3 of this document, section 3.5.5, describes subsistence activities occurring in the Refuge. The communities of Manokotak, Togiak, Twin Hills, Goodnews Bay, Platinum, Quinhagak, Dillingham, Aleknagik, and Clark's Point are all within or adjacent to the Refuge and make use of the refuge resources to varying degrees. Primary subsistence-use areas within the Refuge are the Kanektok, Goodnews, Togiak, Igushik, Osviak, and Matogak rivers, particularly during the ice-free period. During periods of snow-cover, the entire refuge can be considered to be utilized for subsistence activities.

Following is a Section 810(a) analysis of the actions of the preferred alternative.

All elements of the preferred alternative address recreational use of the refuge which occurs from approximately mid-June through mid-September. The analysis is based specifically on this time period.

Issue 1: Public use at Cape Peirce Wildlife Viewing Area: A very small amount of subsistence use takes place within, or in the vicinity of, the Cape Peirce Wildlife Viewing Area during the subject period of analysis. In the past 25 years, it is believed that fewer than one walrus hunt annually has taken place during the period when non-subsistence users likely would be in the area for wildlife viewing. The opportunity to harvest seals and pick berries also exists at the site but there are few known occurrences for these activities during the mid-June through mid-September period. Collection of eggs on Shaiak Island and the harvest of waterfowl in Nanvak Bay do take place, but on a very limited basis. No occurrences of conflicts between subsistence and recreational users are known to have taken place in the viewing area. Based on the low amount of subsistence use at the site and the nature of the wildlife viewing that takes place, it is expected that no restriction to subsistence opportunities at the Cape Peirce Wildlife Viewing Area would take place by adoption of the preferred alternative.

Issue 2: Unguided recreational opportunities: Kanektok and Goodnews river watersheds: The preferred alternative for Issue 2 would cap the number of unguided float starts on the two subject rivers. As discussed in Section 3.5.5, both the Kanektok and Goodnews rivers are used by residents of Quinhagak and Goodnews Bay, as well as Platinum for subsistence activities. Much of this use occurs downstream from the refuge boundary. The main use of the Kanektok River for subsistence activities in the summer period is to conduct fishing activities and for picking berries. A secondary but important use is for moose hunting beginning on September 1. For both activities, there is an opportunity for conflict with the unguided recreational users that are being authorized per this recommended alternative. As detailed in Section 3.3.5, of the 51 traditionally used fishing sites on the Kanektok River, 29 are above the wilderness boundary and in the refuge. These sites are not all used on an annual or regular basis but are an important component of the subsistence harvest opportunity.

Under this alternative, unguided float trips originating at Kagati Lake would be limited to one start every other day during the peak use seasons (June 25 – July 15; August 10-September 7). This would alternate with a guided start every other day, resulting in the possibility of a float party start each day during the peak seasons and some level more than that during the period July 16 through August 9.

Rainbow trout are the primary attraction for recreational visitors to the Kanektok River. Recreational fishing for rainbow trout is restricted to catch-and-release only from June 8 through October 31, and tackle is restricted to unbaited artificial lures with a single hook. These actions were put in place to reduce the potential for dramatic changes in the age structure of rainbow trout. Because of the restrictive harvest regulations for rainbow trout during the summer months, it is believed that the availability of this resource is adequate to meet subsistence needs during the remainder of the year.

Salmon are another major attraction for recreational anglers on the Kanektok River. The vast majority of subsistence salmon fishing on the Kanektok River takes place outside of the refuge in closer proximity to the village of Quinhagak and where fish enter the river from Kuskokwim Bay. For this reason, it is believed that subsistence opportunities for the harvest of salmon would not be significantly restricted by the level of recreational use in the proposed alternative.

A small harvest of moose (estimated at 2-5 animals) takes place on the Kanektok River each fall. Federal lands are closed for the harvest of moose. State lands, which include the river below ordinary high water mark are open from September 1 through September 30. Although early September is considered late for the start of float trips from Kagati Lake, there are always several groups on the river at this time. It is possible that these groups are negatively impacting subsistence moose hunting opportunities. One complaint of a float party interfering with a moose hunt was investigated in 2007 but no evidence could be found to substantiate the claim. Given the fact that a small amount of float use occurs after September 1, that all of this use is effectively complete by September 10, and that the moose hunting season continues through the month of September, it is believed that recreational float use on the river would not significantly restrict this subsistence activity.

As stated in Section 3.5.5.2, on the Goodnews River most subsistence fishing for resident species occurs in the lower 10 to 15 miles of the river which is outside the Refuge boundary. Fishing for salmon usually takes place with gill nets along the shore of Goodnews Bay as well as a short distance up the Goodnews River. These sites are also outside of the refuge. Very limited, or no, conflicts are known to exist between recreational and subsistence fishing within the refuge on the Goodnews River. This is expected to continue, even if additional use up to the maximum levels identified in the preferred alternative, are authorized.

Based on the above analysis of subsistence use on the Kanektok and Goodnews rivers and the maximum levels of unguided float trips proposed, it is not believed that there would be any significant restriction to subsistence use through implementation of this preferred alternative.

Issue 3: Waste Management: Decisions made relative to this issue are not subject to the 810 (a) evaluation because they do not involve the withdrawal, reservation, lease, or permitting the use, occupancy, or disposition of public lands.

Issue 4: Commercial Sport Fish Guiding – Goodnews River: This alternative proposes to authorize commercial sport fishing on the North Fork and Middle Fork at lower or similar levels to what has been authorized since 1991. As stated in Section 3.5.5.2, most subsistence fishing for resident species occurs in the lower 10 to 15 miles of the Goodnews River which is outside the Refuge boundary. Fishing for salmon usually takes place with gill nets along the shore of Goodnews Bay as well as a short distance up the Goodnews River. These sites are also outside of the refuge. Very limited, or no, conflicts are known to exist between recreational and subsistence fishers within the refuge on the Goodnews River.

Issue 4: Commercial Sport Fish Guiding – Osviak and Matogak Rivers: Decisions made relative to this issue are not subject to the 810 (a) evaluation because they do not involve the withdrawal, reservation, lease, or permitting the use, occupancy, or disposition of public lands

Issue 4: Commercial Sport Fish Guiding – Togiak River: This alternative proposes to authorize commercial sport fishing on the Togiak River at the same levels that have been authorized since 1991. The 1991 Public Use Management Plan evaluated traditional subsistence fishing sites located on the Togiak River within the refuge. At that time, a level of commercial sport fish guiding was authorized that allowed half of the sites (nine of 18) to be available for subsistence users even if the maximum amount of sport fish guiding was taking place, which is seldom the case. For example, in 2009, of the nine commercial parties authorized at one time on the river, an average of less than three occurred. In 1991 it was determined that the level of commercial sport fishing use proposed would not significantly restrict subsistence use. Subsistence users from Togiak and Twin Hills mainly use the lower five miles of the Togiak River outside of the refuge during the early summer, and Togiak Lake within the refuge during the fall. Although authorized to operate during the entire season, commercial sport fishing on the river within the refuge is conducted mainly from late July through early September. The refuge conducts a river ranger program on the Togiak River each summer to assess use and provide information to recreational users. The level of commercial sport fishing use authorized in the 1991 PUMP and which is proposed at the same level in this document has not resulted in a restriction to subsistence opportunities per Refuge Information Technician and River Ranger Pete Abraham. Upon evaluation of that decision and the subsequent use since that time, it is determined that the preferred alternative now presented would not significantly restrict subsistence use.