



U.S. Fish and Wildlife Service  
U.S. Department of the Interior

Alaska Regional Office  
Anchorage, Alaska

**Non-Subsistence Take of Wildlife: Proposed Regulatory Updates to Methods and Means  
for Predator Harvest on National Wildlife Refuges in Alaska**

*Draft Environmental Assessment*  
*December 23, 2015*

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## 1.0 Purpose and Need for the Proposed Action

### 1.1 Introduction

The U.S. Fish and Wildlife Service (USFWS) is proposing to amend regulations for the non-subsistence take of wildlife on National Wildlife Refuges (refuges) in Alaska by publishing a proposed rule through a formal-rulemaking process (incorporated by reference). The proposed rule can be divided into three main components: 1) clarification of how our existing mandates for the conservation of natural and biological diversity, biological integrity, environmental health on refuges in Alaska relate to predator control (50 CFR 36.32); 2) prohibition of several particularly efficient methods and means for take of predators (50 CFR 36.32); and, 3) updating our public participation and closure procedures (50 CFR 36.42). This proposed rule would not change Federal subsistence regulations (36 CFR 242 and 50 CFR 100) or restrict the taking of fish or wildlife for subsistence uses under Federal subsistence regulations.

The Department of the Interior (DOI) Categorical Exclusion 43 CFR 46.210 (i) (Policies, directives, regulations, and guidelines: that are of an administrative, financial, legal, technical, or procedural nature) applies to some of the proposed rule. The USFWS has prepared this Draft Environmental Assessment (EA) to address those portions to which it does not apply in accordance with 40 CFR 1501.4(b) so as to fully disclose any potential for environmental effects related to the prohibited methods and means section of the proposed rule. This Draft EA only analyzes the potential effects of the portion of the proposed rule that covers prohibition of several particularly efficient methods and means for take of predators, including the: 1) take of bear cubs or sows with cubs (exceptions apply, see below for details), 2) take of brown bears over bait, 3) take of bears using traps or snares, 4) take of wolves and coyotes from May 1 - August 9, and 5) same-day airborne take of bears on the following resource categories: wildlife (terrestrial mammals) and habitats; subsistence; public use; and wilderness. The USFWS has determined that environmental analysis of the other aspects of the proposed rule would not inform agency decision-making and thus was not included in this EA.

The USFWS is proposing this rule and this associated Draft EA, to ensure that the non-subsistence take of wildlife under State regulations on refuges in Alaska is consistent with our legal mandates and policies for administration of those refuges. We are also proposing to update our regulations for public participation and closures to make them more consistent with other existing Federal regulations and to more effectively engage and inform the public.

The USFWS has various mandates it must adhere to in managing refuges in Alaska. There are three statutes in particular that provide direction and authority that inform the management of the refuges in Alaska: The Alaska National Interest Lands Conservation Act (ANILCA) (16 U.S.C. 3111–3126); the National Wildlife Refuge System (NWRS) Improvement Act (Improvement Act) 16 U.S.C. 668dd–668ee, which amended the National Wildlife Refuge System Administration Act; and the Wilderness Act (16 U.S.C. 1131 – 1136).

ANILCA was established in 1980 (See Section 1.3 for more information). Title III of ANILCA lists the following purposes for all refuges in Alaska:

- (i) To conserve fish and wildlife populations and habitats in their natural diversity;

- (ii) to fulfill the international treaty obligations of the U.S. with respect to fish and wildlife and their habitats;
- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents (except Kenai Refuge); and
- (iv) 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.

In addition, there are specific purposes for each refuge (Appendix A).

As outlined above, the first purpose listed for refuges in Alaska under ANILCA is to “conserve fish and wildlife populations and habitats in their natural diversity.” ANILCA clearly states that all other refuge purposes (except international treaty obligations) must be managed consistently with the first purpose for the conservation of natural diversity.

While “natural diversity” remains undefined in law and policy, ANILCA’s legislative history is informative. The Senate Report on H.R. 39, which formed the basis for ANILCA states that refuges represent “the opportunity to manage these areas on a planned ecosystem-wide basis with all of their pristine ecological processes intact” (Senate Report No. 96-413, page 174). It is also clearly documented in the ANILCA legislative history that conservation of natural diversity refers not only to “protecting and managing all fish and wildlife populations within a particular wildlife refuge system unit in the natural ‘mix,’ not to emphasize management activities favoring one species to the detriment of another” (126 Congressional Record H12351 1980), but also conservation of the natural interactions, dynamics, cycles, and processes between species and their habitats. The House Congressional Record further states that in managing for natural diversity, “the USFWS is directed to manage wildlife refuges to assure that habitat diversity is maintained through natural means, avoiding artificial developments and habitat manipulation programs... (example given); to assure that wildlife refuge management fully considers the fact that humans reside permanently within the boundaries of some areas and are dependent, ... on wildlife refuge subsistence resources; and to allow management flexibility in developing new and innovative management programs different from lower 48 standards, but in the context of maintaining natural diversity of fish and wildlife populations and their dependent habitats for the long term benefit of all (126 Congressional Record H12351 1980).” In addition, ANILCA requires that Federal agencies manage wildlife consistent with “the conservation of healthy populations of fish and wildlife” (16 U.S.C. 3112(1)). The legislative history defines this phrase as “maintenance of fish and wildlife resources in their habitats in a condition which assures stable and continuing natural populations and species mix of plants and animals in relation to their ecosystems, including recognition that local rural residents engaged in subsistence uses may be a natural part of that ecosystem...” (Senate Report No. 96-413, page 233).

ANILCA provides a priority to rural Alaskans for the non-wasteful taking of fish and wildlife for subsistence uses on Federal public lands in Alaska, including refuges. Under ANILCA, all refuges in Alaska are also mandated to provide the opportunity for continued subsistence use by local rural residents, as long as this use is not in conflict with the conservation of fish and wildlife populations and habitats in their natural diversity or fulfilling the international treaty

obligations of the United States with respect to fish and wildlife and their habitats. Additionally, Title VIII of ANILCA, section 802, states that “consistent with sound management principles, and the conservation of healthy populations of fish and wildlife...the purpose of this title is to provide the opportunity for rural residents engaged in a subsistence way of life to do so.” The USFWS recognizes the importance of the fish, wildlife, and other natural resources in the lives and cultures of Alaska Native peoples and in the lives of all Alaskans and we continue to recognize subsistence uses of fish and wildlife and other renewable resources as the priority consumptive use on refuges in Alaska. This proposed rule would not change existing or future Federal subsistence regulations (36 CFR 242 and 50 CFR 100) or restrict taking of fish or wildlife for subsistence uses under Federal subsistence regulations.

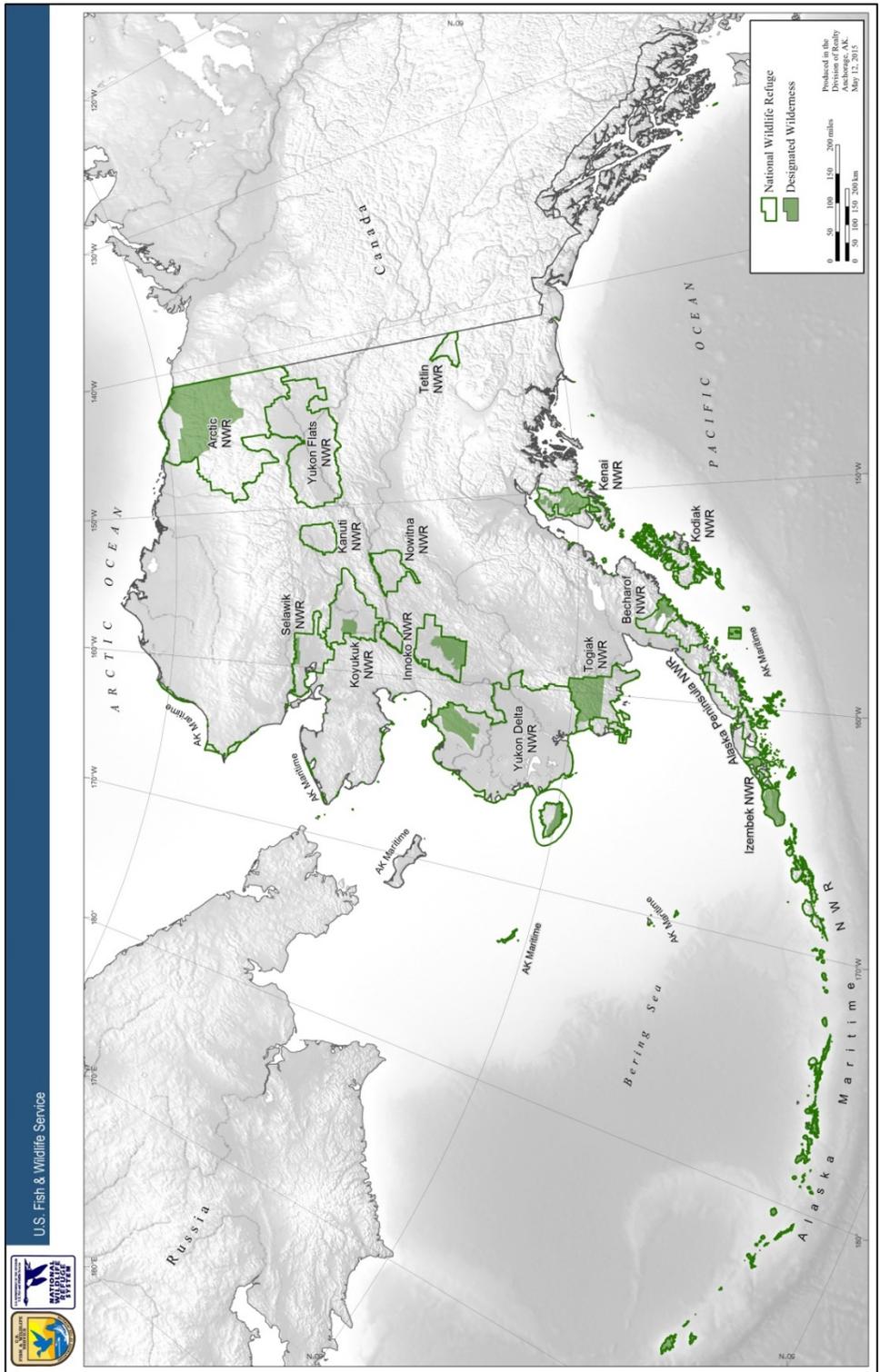
The National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), states that refuges must be managed to fulfill the mission of the NWRS and purposes of the individual refuge. The Improvement Act also clearly states the mission of the NWRS, which is to “administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” Section 4(a) (4) (B) of the Improvement Act states that “In administering the System, the Secretary shall...ensure that the biological integrity, biological diversity, and environmental health (BIDEH) of the System are maintained for the benefit of present and future generations of Americans...” (16 U.S.C. 668dd (a) (4) (B)). The USFWS BIDEH policy (601 FW 3), which provides guidance for implementation of the Improvement Act, defines biological integrity as “biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.” In that policy, biological diversity is defined as “the variety of life and its processes, including the variety of living organisms, the genetic differences among them, and communities and ecosystems in which they occur.” The policy defines environmental health as the “composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.” Abiotic features are non-living chemical and physical features of the environment (e.g. soil, air, water, temperature, etc.). The policy also defines “historic conditions” as the “composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human related changes to the landscape.” In implementing this policy on refuges, the USFWS favors “management that restores or mimics natural ecosystem processes or functions to achieve refuge purposes(s).” Additionally, this policy, directs the USFWS to “formulate refuge goals and objectives for population management by considering natural densities, social structures, and population dynamics at the refuge level” and manage populations for “natural densities and levels of variation.”

The Wilderness Act of 1964 states that wilderness “is hereby recognized as an area where the earth and its community of life are untrammelled by man . . . which is protected and managed so as to preserve its natural conditions.” Our wilderness stewardship policy (610 FW 1) interprets “untrammelled” to be “the freedom of a landscape from the human intent to permanently intervene, alter, control, or manipulate natural conditions and processes.” This policy also directs that USFWS will not manipulate ecosystem processes, specifically including

predator/prey fluctuations, in wilderness areas unless “necessary to accomplish the purposes of the refuge.”

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Figure 1. National Wildlife Refuges within the State of Alaska and Designated Wilderness.



In addition to the three overarching statutes, the USFWS has other important policies and mandates influencing the management of resources on refuges include those dealing with visitor use, recreation, and compatibility. The overarching goal of the USFWS policy on wildlife-dependent recreation is to enhance opportunities and access to quality visitor experiences on refuges and to manage the refuge to conserve fish, wildlife, plants, and their habitats (605 FW 1.6). We recognize hunting as one of many priority uses of the NWRS (when and where compatible with refuge purposes) that is a healthy, traditional outdoor pastime, deeply rooted in the American heritage (605 FW 2). As stated in part 36 of title 50 of the Code of Federal Regulations (50 CFR 36), the taking of fish and wildlife through public recreational activities, including general/sport hunting, is authorized on refuges in Alaska “as long as such activities are conducted in manner compatible with the purposes for which the areas were established” (50 CFR 36.31(a)).

Predator control is defined by the Federal Subsistence Board (FSB) as the intention to reduce the population of predators for the benefit of prey species (FSB 2003). The USFWS has used predator control and animal control and eradication programs where there is a need to restore natural or biological diversity, biological integrity, or environmental health, or to remove a non-native species from refuges throughout the NWRS. However, the USFWS prohibits predator control on refuges in Alaska, unless it is determined necessary to meet refuge purposes, other federal laws, or policy mandates and is consistent with USFWS mandates to manage for natural diversity of species populations and habitats and maintenance of biological integrity, diversity, and environmental health on refuges in Alaska. The USFWS in Alaska has made clear through numerous internal and external communications and regional directives dating back as far as 1984 (USFWS 1984, USFWS 1992, USFWS 1997,; USFWS 2003; USFWS 2004; USFWS 2004; DOI 2006; USFWS 2006a; USFWS 2006b; USFWS 2006c, USFWS 2006d, USFWS 2011) that the need for predator control must be based on sound science in response to a conservation concern and have a strong biological justification. This requirement is consistent with managing for the conservation of natural and biological diversity, biological integrity, and environmental health under ANILCA and the Improvement Act, and recommendations from the Wildlife Society (2013) and NRC (1997). All refuge purposes (except international treaties) and uses of the refuge must be consistent with and be found to be compatible with the conservation of the natural diversity of species and habitats and as such, demands for more wildlife for human harvest cannot be the sole or primary basis for predator control on refuges in Alaska.

A Refuge Manager would authorize predator control activities on a National Wildlife Refuge in Alaska only if: 1) alternatives to predator management have been evaluated, attempted, and exhausted as a practical means of achieving management objectives; 2) proposed actions have been evaluated and found to be in compliance with the National Environmental Policy Act; 3) a formal refuge compatibility determination has been completed, as required by law; and 4) the potential effects of predator management on subsistence uses and needs have been evaluated through an ANILCA Section 810 analysis.

Sport/general hunting and trapping on Refuges (which is open to residents and non-residents) is generally regulated by the states, unless further restricted by Federal law or regulation [50 CFR 32.2(d)]. These activities remain subject to Federal law, including mandates under ANILCA; the Improvement Act; and, where applicable, the Wilderness Act. Applicable directives and

guidance can also be found in policies in USFWS Manual 601 FW 3 Biological Integrity, Diversity, and Environmental Health, 610 FW 2 Wilderness Administration and Resource Stewardship, and 605 FW 2 Hunting. Additionally, 50 CFR 36.32(a) states, “the Refuge Manager may designate areas where, and establish periods when, no taking of a particular population of fish or wildlife shall be permitted.”

The State’s legal framework for managing wildlife in Alaska is based on sustained yield, which is defined by statute to mean “the achievement and maintenance in perpetuity of the ability to support a high level of human harvest of game” [Alaska Statute (AS) 16.05.255(k) (5)]. Since 1994, AS 16.05.255 has prioritized human consumptive use of ungulates, specifically moose, caribou, and deer. Also known as the Intensive Management (IM) statute (AS 16.05.255), the law requires the Alaska Board of Game (BOG) to designate populations of ungulates for which human consumptive use is the highest priority use and to set population and harvest objectives for those populations. To that end, the BOG must “adopt regulations to provide for IM programs to restore the abundance or productivity of identified big game prey populations as necessary to achieve human consumptive use goals” [AS 16.05.255(e)]. Once designated as an IM population, if either populations or harvests fail to meet management objectives, non-resident hunting must first be eliminated, followed by reductions or eliminations of resident harvest opportunities. However, under the IM statute, the BOG may not reduce the harvest opportunities of an identified IM ungulate population unless it has adopted, or is considering the adoption, of regulations “to restore the abundance or productivity of the ungulate population through habitat enhancement, predation control, or other means” [AS 16.05.255(e)–(g) and (j)].

The BOG has adopted regulations under the IM statute that require targeted reductions of wolf, black bear, brown bear, or a combination of these in designated “predator control areas” within game management units (GMUs) (Figure 2). These State regulations are implemented through IM plans that authorize activities including aerial shooting of wolves or bears or both by State agency personnel, trapping of wolves by paid contractors, allowance under permit for same-day airborne hunting of wolves and bears by the public, and allowance under permit for the take of any black or brown bear through baiting or snaring by the public.

Thirteen of the 16 refuges in Alaska contain lands within GMUs officially designated for IM (Figure 3). While predator control activities occurring under the authority of an IM plan have not been authorized on any refuge in Alaska, some predator control programs and activities are being implemented in predator control areas immediately adjacent to refuges. Given the large home ranges of many species affected by IM actions, these control programs have the potential to impact wildlife resources, natural systems, and ecological processes, as well as conservation and management of these species on adjacent refuges.

In recent years, concurrent with its adoption and implementation of IM plans for predator control areas, the BOG has also adopted measures under its general hunting and trapping regulations that have the potential to greatly increase effectiveness for taking of predators and disrupt natural processes and wildlife interactions. Some of these measures have also been adopted under Federal subsistence regulations, which only apply to Federally qualified subsistence users. Examples of these recently adopted measures, which apply beyond areas officially designated for IM, including many refuges in Alaska, are:

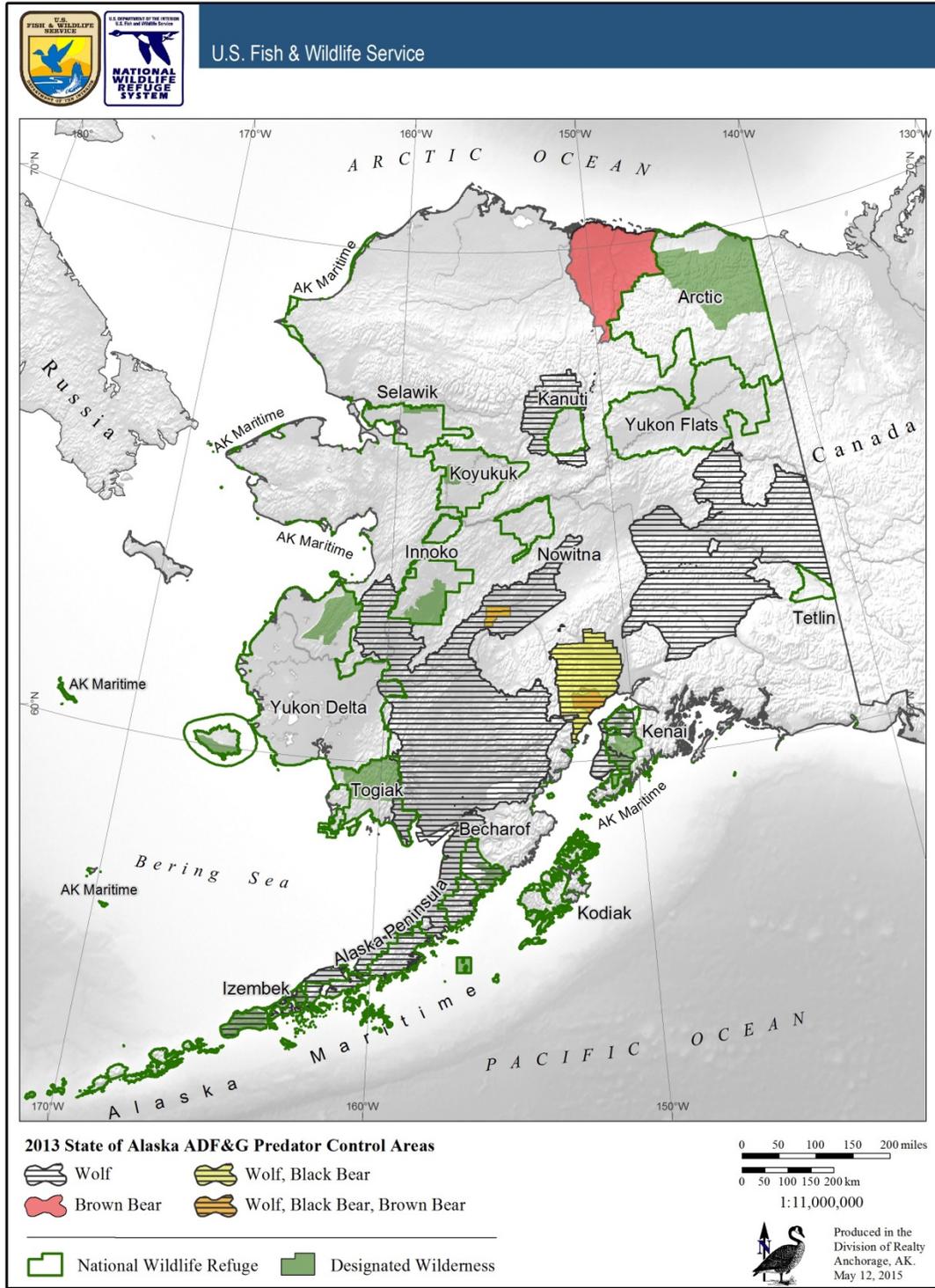
- Harvesting brown bears over bait at registered black bear bait stations;

- Taking wolves and coyotes (including pups) during the denning season;
- Expanding season lengths and increasing bag limits;
- Classifying black bears as both furbearers and big game species (which could allow for trapping and snaring of bears and sale of their hides and skulls);
- Authorizing same-day airborne take of bears at registered bait stations.

Many of the recent actions by the BOG to liberalize the State's regulatory frameworks for general hunting and trapping of wolves, bears, and coyotes reverse long-standing prohibitions and restrictions on take of these wildlife species under State law. Unlike the practice of taking brown bears over bait, black bear baiting has been an authorized practice in Alaska since 1982, including on refuges. Black bear baiting is authorized by the State pursuant to a permit and, in some instances, a special use permit (USFWS Form 3-1383-G) issued by refuges.

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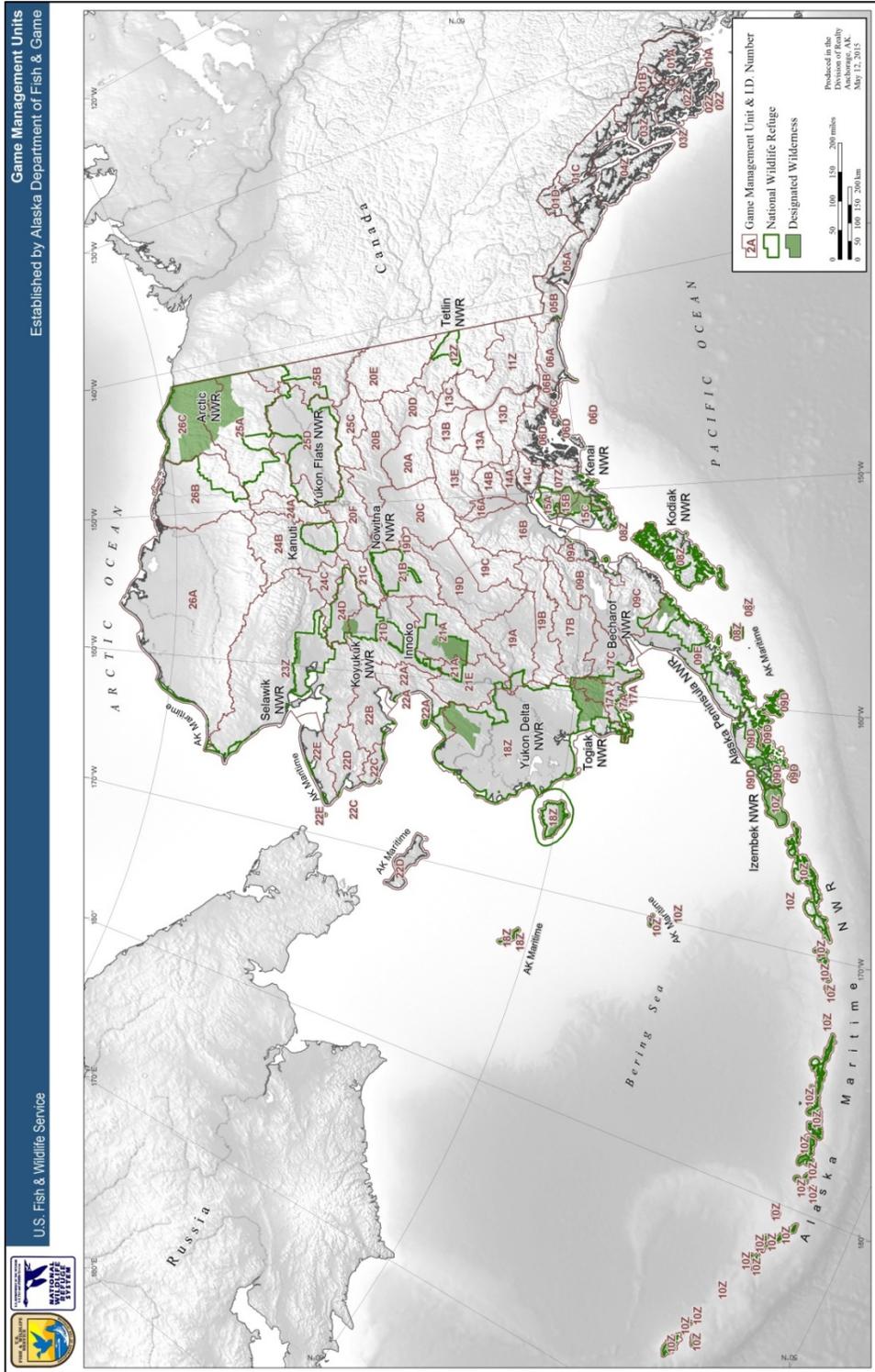
Figure 2. State of Alaska Predator Control Areas for 2013.



Implementation of IM actions under the IM statute and many of the recent liberalizations of the general hunting and trapping regulations have direct implications for the management of refuges in Alaska. Predator-prey interactions represent a dynamic and foundational ecological process in Alaska's arctic and subarctic ecosystems, and are a major driver of ecosystem function (NRC 1997). Regulations or activities on refuges in Alaska that allow for unsustainable (i.e. particularly efficient) methods and means for the take of wildlife that could lead to overharvest or the disruption of natural or biological diversity, biological integrity, or environmental health are in direct conflict with our legal mandates for administering refuges in Alaska under ANILCA, the Improvement Act, and the Wilderness Act, as well as several applicable agency policies (601 FW 3, 610 FW 2, and 605 FW 2). Additionally, regulations or practices that allow for hunting or trapping of wildlife when the harvested animals will not be utilized conflict with USFWS policy on administration of recreational hunting programs on refuges (605 FW 2). Such allowances violate a requirement under policy 605 FW 2 to manage refuge hunting programs in a manner that promotes respect for the resource and are inconsistent with the guiding principles of refuge hunting programs set forth in policy, including the promotion of visitor understanding and appreciation for America's natural resources.

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Figure 3. National Wildlife Refuges in Alaska and Game Management Units.



## **1.2 Purpose and Need**

This Draft EA evaluates the proposed rule and considers the potential environmental effects on Alaska refuge resources, including wildlife (terrestrial mammals) and their habitats; federally authorized subsistence uses including hunting, trapping, and fishing; public use; and wilderness character. Proposed regulations are available for concurrent public review at [www.regulations.gov](http://www.regulations.gov). This Draft EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 et. Seq.), and its implementing regulations (40 CFR parts 1500-1508).

The USFWS has developed this proposed rule and associated Draft EA to ensure that take of wildlife under State regulations on refuges in Alaska is consistent with our legal mandates and policies for administration of those refuges. The purpose of the proposed rule's prohibition on certain particularly efficient methods and means of non-subsistence take of predators is to ensure that take of wildlife on refuges in Alaska is managed consistently with USFWS mandates to conserve fish and wildlife populations and habitats in their natural diversity and to maintain biological diversity, biological integrity, and environmental health for the benefit of present and future generations of Americans on refuges in Alaska.

The proposed prohibition of certain methods and means for the non-subsistence take of predators is needed, in light of current State laws and regulations that reverse long-standing prohibitions for the take of predators, in order to prevent predator populations from being reduced to levels below that which reflects conservation in their natural diversity and take of wildlife on refuges that is inconsistent with conserving natural and biological diversity, biological integrity, and environmental health.

## **1.3 Laws, Regulations, and Policies**

The following sections outline the principal requirements of applicable laws, regulations and policies for the proposed action

### **1.3.1 National Environmental Policy Act (NEPA)**

NEPA requires federal agencies to integrate environmental values into their decision-making processes. The analysis must identify and disclose to the public the potential environmental impacts of the proposed actions and reasonable alternatives to those actions. This Draft EA analyzes the potential impacts that could result from the alternatives considered, including the No Action alternative. This Draft EA has been prepared in accordance with the NEPA and the implementing regulations of the Council on Environmental Quality (CEQ) at 40 CFR 1508.9.

This Draft EA provides sufficient evidence and analysis for determining whether there is potential for significant impact, thus requiring an Environmental Impact Statement, or where there is justification to prepare a Finding of No Significant Impact (FONSI). This Draft EA also provides important information for pending decisions for the USFWS in determining whether to finalize the proposed rule.

### **1.3.2 U.S. Fish and Wildlife Service (USFWS)**

Part of the Department of Interior, the USFWS is the principal Federal agency responsible for conserving, protecting, and enhancing the nations fish, wildlife, plants and their habitats. In addition to the NWRS, there are several other programs under the USFWS in Alaska, such as fisheries and ecological services, subsistence management, science applications, migratory bird

management, and international affairs. The USFWS enforces Federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally important fisheries, conserves and restores wildlife habitats such as wetlands, and helps foreign governments with their conservation efforts. It oversees the Federal Aid in Wildlife Restoration Program.

The mission of the USFWS is:

*“Working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.”*

### **1.3.3 National Wildlife Refuge System (NWRS)**

The NWRS comprises approximately 150 million acres of Federal lands, encompassing 556 national wildlife refuges, six national monuments, thousands of small wetlands, and other special management areas. NWRS lands are located in all 50 states and the territories of the United States.

The NWRS was created to conserve fish, wildlife, plants and their habitats. This conservation mission provides Americans with opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on NWRS lands and to better appreciate the value and need for fish and wildlife conservation.

### **1.3.4 Alaska National Interest Lands Conservation Act (ANILCA) (1980) (Public Law 96-487) 16 U.S.C. 3101 - 3233**

With the enactment of ANILCA in 1980, Congress established or expanded approximately 54 million acres of land in the NWRS including National Wild and Scenic Rivers and National Wilderness areas. With this Act, Congress created nine new refuges and expanded and/or renamed seven other already established refuges in Alaska (Appendix A). Important sections of ANILCA for this Draft EA include Title VIII, which defines subsistence as customary and traditional uses of wild renewable resources by rural Alaska residents (Section 803), establishes a subsistence priority for rural Alaskans on federal public lands and waters (Section 804), and provides for a system of regional advisory councils to insure the participation of rural residents in subsistence management (Section 805). Section 810 of ANILCA requires analysis of impacts to subsistence from federal land use decisions. Section 811 ensures reasonable access to subsistence resources on federal public lands, including the use of snowmobiles, motorboats, and other means of surface transportation traditionally employed for subsistence purposes, subject to reasonable regulations.

Title XI of ANILCA provides that, subject to reasonable regulations, the use of snowmobiles, motorboats, airplanes, and non-motorized surface transportation methods for traditional activities within conservation system units is permitted, including Refuges and wilderness areas.

Title XIII of ANILCA includes several additional elements for wilderness management in Alaska, including provisions allowing continued use of existing cabins, subject to some restrictions; new public use cabins as necessary for the protection of public health and safety (Section 1315); and the continuance of existing uses and future establishment and use of temporary facilities directly related to the taking of fish and wildlife, subject to reasonable regulations (Section 1316).

ANILCA takes precedence over the Improvement Act if there is a conflict between the two, and provides the primary direction for management specific to refuges in Alaska (16 U.S.C. 668dd–668ee). ANILCA added approximately 54 million acres of land to the NWRS in Alaska, to be managed by USFWS, creating nine new refuges and expanding and/or renaming seven other already established refuges. ANILCA also designated 18.7 million acres in 13 wilderness areas on refuges in Alaska as units of the National Wilderness Preservation System (Figure 1).

### **1.3.5 National Wildlife Refuge System Administration Act (1966), as amended (16 U.S.C. 668dd-668ee)**

The National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), established a unified mission for the NWRS and a compatibility standard for assessing proposed uses within a refuge. While the NWRS is dedicated to the conservation of fish, wildlife, and plant resources and their habitats, other uses may occur if they are determined to be compatible. A compatible use is a use that, in the sound professional judgment of the Director of the Service, will not materially interfere with or detract from the fulfillment of the mission of the NWRS or the purposes of the refuge.

The Improvement Act requires that all refuges be managed under a comprehensive conservation plan (CCP) that is developed through an open public process. Refuge CCPs provide broad policy guidance based on existing laws, regulations, and USFWS policy, and establish the long-term direction, goals, and objectives for management of a refuge, as required under Section 304(g) of ANILCA. Each refuge in Alaska has a comprehensive conservation plan (USFWS 1985, USFWS 1988a, USFWS 1988b, USFWS 1988c, USFWS 2005, USFWS 2007, USFWS 2008a, USFWS 2008b, USFWS 2008c, USFWS 2009a, USFWS 2009b, USFWS 2010, USFWS 2011, USFWS 2015). The FWS may update CCPs or other management plans for Alaska refuges if conflicts are found between the proposed rule and these documents.

### **1.3.6 Wilderness Act (1964) (16 U.S.C. 1131 - 1136)**

The *Wilderness Act of 1964* (16 U.S.C. 1131–1136) established a national system of wilderness areas, with the following purposes:

- Secure for the American people of present and future generations an enduring resource of wilderness;
- Preserve the wilderness character of areas within the National Wilderness Preservation System;
- Administer the National Wilderness Preservation System for the use and enjoyment of the American people in a way that will leave these areas unimpaired for future use and enjoyment as wilderness;
- Gather and disseminate information regarding the use and enjoyment of wilderness areas; and
- Wilderness areas are to be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

As noted above, ANILCA established the wilderness on several Refuges and provided additional guidance for management of wilderness areas in Alaska, including access for subsistence and

other traditional uses, cabins, and temporary shelters associated with hunting (including trapping) and fishing.

### **1.3.7 State Laws**

The Alaska Department of Fish and Game is responsible for the sustainability of all fish and wildlife in the State of Alaska, regardless of land ownership or designation, and has the authority, jurisdiction, and responsibility to manage, control, and regulate fish and wildlife populations – including for State-managed subsistence purposes – unless specifically preempted by federal law. The state’s subsistence laws require that fish and wildlife harvest regulations provide for noncommercial, customary, and traditional uses. All Alaskans are eligible to hunt and fish under state subsistence regulations, as opposed to the rural subsistence user preference given under ANILCA. Other State Statutes that are applicable to this analysis include AS 16.05 - .255 (e-j); IM Alaska Code (AC) 5 AK admin code 92.122; General regulations AC 5 AAC 85.001 - .005; Bag limits AC 5 AAC 85.010 - .075 (see the proposed rule for further information).

### **1.4 Public Involvement**

Since the proposed action is of high public interest to users of refuges in Alaska, the USFWS has held numerous Tribal and Alaska Native Claims Settlement Act (ANCSA) Corporation consultations and presented at various meetings and conferences open to the general public in the initial stages of planning for the proposed rule.

#### **1.4.1 Consultation with Federally-Recognized Tribes and Native Corporations**

In compliance with Executive Order 13175, Consultation and Coordination with Indian tribal Governments, Federal agencies are required to consult with federally recognized tribal governments during the NEPA process for certain actions including the development of regulations. Under Public Law 108-199, the Executive Order also applies to corporations established under ANCSA. Within the USFWS and DOI the Executive Order is implemented by the Department of the Interior policies on Consultation with Indian Tribes (December 2011) and Consultation with ANCSA Corporations (August 2012). The USFWS sent out an initial request for consultation letter to all Tribes, ANCSA Corporations, and Native non-profit organizations in Alaska, and the Alaska Federation of Natives, on September 24, 2014. The USFWS then sent a follow-up letter to the same contacts in the first week February 2015 and another in mid-May 2015. The USFWS conducted three statewide Tribal consultation teleconferences that included opportunity to dialogue with the Regional Director and the Chief of Refuges for Alaska. These teleconferences were held in November 2014 and February 2015. The USFWS also reached out to Tribes, ANCSA corporations, and Native non-profit organizations through phone calls, emails, and meetings. For a complete list of the Tribes, regional and village corporations contacted, see Appendix B.

#### **1.4.2 Other Outreach**

In addition to the Tribal governments and ANCSA corporations, the USFWS is consulting with the State of Alaska. The USFWS has met with the Alaska Department of Fish and Game (ADF&G) leadership and staff to specifically discuss the proposed rule on two occasions, one in December 2014 and one in February 2015. The USFWS Alaska Regional Director and Alaska Chief of Refuges have also had numerous phone calls, email conversations, and meetings with

State leadership that included discussion regarding the proposed rule. The USFWS also briefed the BOG on the proposed rule at their March 13, 2015 public meeting.

The USFWS has met with and discussed the proposed rule with the Citizens Advisory Commission on Federal Areas and Alaska Professional Hunters Association, as well as other interested groups. The USFWS has presented on the proposed rule at conferences and meetings including the Alaska Federation of Natives (October 2014), Bureau of Indian Affairs Service Providers Conference (November 2014), Western Arctic Caribou Herd Meetings (December 2014), and the Federal Subsistence Regional Advisory Council (RAC) meetings (September – October 2014 and February – March 2015). The USFWS Alaska Regional Director has also met with the Alaska Congressional Delegation to discuss the proposed rule on several occasions since fall 2014.

### **1.5 Issues Raised During Public Outreach**

The proposed rule has been drafted based on feedback the USFWS received from the public outreach, including Tribal and ANCSA corporation consultation, conducted from fall 2014 to present.

Many of the changes that the USFWS has made to their proposed rule were based on early input received from staff, Tribes, and rural communities in Alaska. The USFWS heard concern about the original proposal to duplicate many already existing State regulations in Federal regulations (folks felt this was unnecessary and confusing), the proposed prohibited methods and means that prohibited cultural and traditional practices allowed under State regulations, and the need to more clearly articulate the reasoning for this proposed rule. The USFWS also heard a considerable amount of concern about certain aspects of the original proposed closure and restriction procedures.

As a result of numerous internal and external discussions, the USFWS concluded that there was a need to focus our effort more on the primary issue of concern, which was ensuring that take of predators on refuges in Alaska, was being managed consistently with our mandates for the conservation of natural diversity, biological integrity, biological diversity and environmental health. A secondary need for updating our procedures for closures and restrictions on refuges in Alaska, in effort to increase consistency with other Federal regulations and more effectively engage the public, was also identified. The USFWS also decided early on that nothing in the proposed rule would apply to or change Federal subsistence regulations. Thus, the USFWS narrowed the scope of what was being considered for inclusion under the proposed rule to only those items that were in line with the primary goal (consistency with our mandates as they relate to the take of predators), the needed updates to the public participation and closure procedures, and a few additional minor updates as needed. The USFWS reduced the number of prohibited methods and means proposed for inclusion in the proposed rule from 16 to five. Almost all of these wildlife harvest take restrictions (listed below) are already prohibited under State and Federal law and regulation and thus are not currently allowed on refuges in Alaska. The following is a list of methods and means that the USFWS has decided not to propose under refuge-specific regulations at this time:

- 1) Shooting from, on, or across a refuge road or highway.
- 2) Using any poison or other substance that kills or temporarily incapacitates wildlife.

- 3) Taking wildlife from a motorboat, motor vehicle or snowmachine (exception: (A) if the motor has been completely shut off and progress from the motor's power has ceased).
- 4) Using an aircraft, snowmachine, motorboat, or other motor vehicle to harass wildlife, including chasing, driving, herding, or molesting wildlife.
- 5) Taking big game while the animal is swimming.
- 6) Using a machine gun, set gun, or a shotgun larger than 10 gauge.
- 7) Using the aid of a pit, fire, artificial salt lick, explosive, expanding gas arrow, bomb, smoke, chemical or a conventional steel trap with an inside spread over nine inches (exception: killer style traps with an inside jaw spread of less than 13 inches may be used for trapping, except to take any species of bear or ungulate).
- 8) Using any electronic device, including but not limited to artificial light, laser sights, electronically enhanced night vision scope, radio or satellite communication, remote controlled aircraft including drones, cellular or satellite telephone, or motion detector to take harass, chase, drive, herd, or molest wildlife. Exceptions:
  - a. Rangefinders may be used.
  - b. Electronic calls for all game animals except moose.
  - c. Artificial light may be use for the purpose of taking furbearers under a trapping license during an open season from November 1 to March 31 where authorized by the State.
    - i. Artificial light may be used by a tracking dog handler with one leashed dog to aid in tracking and dispatching a wounded big game animal.
    - ii. Under Alaska State law, artificial light may be used by resident hunters to take a black bear on refuges under customary and traditional use activities at a den site October 15 through April 30 in game management units 21B, 21C, 21D, 24 and 25D.
    - iii. Electronic devices approved in writing by the Regional Director
- 9) Taking big game with the aid or use of a dog. Exceptions:
  - a. Leashed dog for tracking wounded big game.
  - b. Taking black bear pursuant to a permit issued from the State)
- 10) Taking fur animal or furbearer by disturbing or destroying a den.
- 11) Engaging in trapping activities as the employee of another person.

Additionally, in response to significant concerns brought to our attention by Tribes and rural residents, the USFWS decided not to include proposed language which would open Alaska refuges to the collection of natural resources (i.e., fruits, berries, mushrooms, and other edible plant materials as well as downed timber) by recreational users. This practice would remain open to subsistence users. The USFWS have also made significant changes to other parts of the proposed rule (e.g., the policy statement on predator control and public participation and closures that are not being analyzed in this EA). Please refer to the proposed rule for this information.

## 2.0 Alternatives

NEPA requires review of a reasonable range of alternatives. After much deliberation both internally and externally, the USFWS has developed this Draft EA with two alternatives, the No Action Alternative (Alternative 1) and the Proposed Action Alternative (Alternative 2). After consulting with Tribal governments, ANCSA corporations, Native non-profit organizations, and members of the public, the USFWS has considerably narrowed the scope of what was included

in the proposed rule. These changes are reflected in the proposed action alternative described below. See Section 1.5 (Issues Raised During Public Outreach) for an explanation of what was originally being considered for inclusion in the proposed rule.

## 2.1 Proposed Action

The proposed action under review in this Draft EA includes the following substantive changes that would be found in the proposed rule:

The USFWS would prohibit particular methods and means for the harvest of predators on refuges in Alaska. These prohibitions would not apply to the taking of fish or wildlife under Federal subsistence regulations. These prohibitions include:

- (i) Taking black or brown bear cubs or sows with cubs (exception allowed in accordance with State law and regulations for resident hunters to take black bear cubs or sows with cubs under customary and traditional use activities at a den site October 15 – April 30 in specific GMUs);
- (ii) Taking brown bears over bait;
- (iii) Taking of bears using traps or snares;
- (iv) Taking wolves and coyotes during the spring and summer denning season from May 1 – Aug 9; and
- (v) Taking bears from an aircraft or on the same day as air travel has occurred. The take of wolves or wolverines from an aircraft or on the same day as air travel has occurred, is already prohibited under current refuge regulations and this would not change.

These proposed regulations would not apply to Federally qualified subsistence users hunting or trapping under Federal subsistence regulations. These proposed regulations would only apply on refuges in Alaska (not to other Federal, State, private, or Native lands or waters).

### 2.2.1 No Action (Alternative 1)

Under the No Action Alternative (Alternative 1), the USFWS would take no additional action to prohibit certain methods and means for the take of predators on refuges in Alaska. All State hunting and trapping regulations that are not currently restricted under existing Federal regulations would apply on refuges in Alaska. All but one (bear snaring) of the proposed prohibited methods and means for the harvest of predators are currently allowed under State regulations on refuges in Alaska. Bear snaring is legal in two GMUs designated for IM that do not include refuges, and could be approved by the BOG in additional GMUs in the future, which could make this practice legal on refuges unless further restricted or prohibited by Federal law or regulation. Alaska refuge lands and waters would remain under federal jurisdiction and the USFWS would continue to work cooperatively with the State of Alaska under tenets of 43 CFR Part 24 – *DOI Fish & Wildlife Policy: State-Federal Relationships* and Master MOU of 1983 (DOI 1983) towards wildlife management and population objectives, retaining the right of refusal under preemption.

Examples of methods and means for take of predators that are currently allowed on refuges in Alaska under State general hunting and trapping regulations include, but are not limited to, the following examples:

- i) Taking of black bear cubs or sows with cubs (limited to an allowance for resident hunters to take black bear cubs or sows with cubs under customary and traditional use activities at a den site October 15 – April 30 in specific game management units (GMUs) and year round in GMU 25D);
- ii) Taking brown bears over bait;
- iii) Taking wolves or coyotes during the denning season; and
- iv) Taking of bears on the same day as air travel has occurred.

Under the Alternative 1 the above methods and means (i – iv), in addition to any other methods and means for take of predators legalized in future State regulations which are not further restricted by Federal law or regulations, would be allowed on refuges in Alaska.

### **2.2.2 Promulgate Regulations to Prohibit Several Particularly Efficient Methods and Means for Take of Predators on Refuges in Alaska – Proposed Action Alternative (Alternative 2)**

Under Alternative 2, the USFWS would publish a proposed rule, prohibiting the use of several particularly efficient methods and means for take of predators on Alaska refuges, including:

- (i) Taking black or brown bear cubs or sows with cubs (exception allowed in accordance with State regulations for resident hunters to take black bear cubs or sows with cubs under customary and traditional use activities at a den site October 15 – April 30 in game management units 19A, 21B, 21C, 21D, 24, and 25D);
- (ii) Taking brown bears over bait;
- (iii) Taking bears using traps or snares;
- (iv) Taking wolves and coyotes from May 1 – August 9; and
- (v) Taking bears from an aircraft or on the same day as air travel has occurred. The take of wolves or wolverines from an aircraft or on the same day as air travel has occurred is already prohibited under current refuge regulations and this would not change.

Alaska refuge lands and waters would remain under federal jurisdiction and the USFWS would continue to work cooperatively with the State of Alaska under tenets of 43 CFR Part 24 – *DOI Fish & Wildlife Policy: State-Federal Relationships* and Master MOU of 1983 (DOI 1983) towards wildlife management and population objectives, retaining the right of refusal under preemption.

## **3.0 Affected Environment**

The affected (existing) environment may be influenced or altered through the proposed action. The affected environment baseline conditions are described below, with four (4) resources areas identified and analyzed. Those resources are: wildlife (terrestrial mammals) and habitats, subsistence, public use, and wilderness. The USFWS is limiting the wildlife and habitats analysis to only include brown bear, black bear, wolf, and coyote, and their habitats. For a more detailed description of the affected environment for each refuge, refer to the CCPs or Land Protection Plans located at <http://www.fws.gov/alaska/nwr/planning/plans.htm>. The USFWS has determined that the following resource areas will have no effect from the proposed action: air quality, geology and soils, hydrology, hazardous materials, fish, birds, marine life, threatened

and endangered species, land use, transportation, noise/soundscape, visual resources, cultural resources and environmental justice.

As stated in the introduction, the only action from the proposed rule that is being analyzed in this Draft EA is the proposed prohibition of several particularly efficient methods and means for take of predators. The USFWS has determined that environmental analysis of the other aspects of the proposed rule would not inform agency decision-making and thus does not warrant inclusion in this EA.

### **3.1 The Project Area**

The proposed action would affect wildlife take on 16 refuges (13 administrative units) in Alaska, (as shown in Figure 1 and listed in Appendix A) comprising a total of approximately 76,744,229 acres. This area is vast, covering every habitat type found in Alaska including mountains, glaciers, tundra, grasslands, wetlands, lakes woodlands, rivers, and coastlines. Together, the 16 refuges comprise 83.35 million acres of land and water, and constitute approximately 56 percent of the entire NWRS and 80 percent of the continental landbase. The refuges in Alaska are world-renowned for their relatively intact ecosystems and natural diversity. Alaska refuges are places where natural and biological diversity, integrity, and environmental health are maintained for the continuing benefit of future generations. Systems function naturally with little interference or manipulation by humans and there is a tight, relatively intact, connection between all biotic and abiotic components and processes.

### **3.2 Wildlife (Terrestrial Mammals) and Habitat**

Alaska refuges have been managing wildlife and their habitats, under the tenets of: 1) statutory - ANILCA, Improvement Act; Wilderness Act where applicable; 2) regulatory – Code of Federal Regulations and other State and Federal regulations where applicable, 3) policy and directives, and 4) professional standards and conventions as reflected through the Wildlife Society and peer-reviewed literature. Under ANILCA, the first establishment purpose listed for refuges in Alaska is conservation of fish and wildlife populations and habitats in their natural diversity, which includes protecting and managing all fish and wildlife populations in their natural ‘mix’ and not emphasizing management activities favoring one species to the detriment of another. This management regime allows for population fluctuations (dynamic equilibrium), possibly including local extirpations. Under the Improvement Act, the USFWS must ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans. The terms biological integrity, diversity, and environmental health are defined in policy (601 FW 3), which directs the USFWS to maintain the variety of life and its processes; biotic and abiotic compositions, structure, and functioning; and to manage populations for natural densities and levels of variation throughout the NWRS.

In very brief terms, ecological theory identifies numerous relationships among species, including parasitism, commensalism, mutualism, competition, and predation (Ricklefs and Miller 2000; Krebs 2001). Predation is regarded as at least equal with competition as a dominant factor in shaping populations within a given ecosystem (Ricklefs 1997; Estes et al. 2001). Predator-prey relationships evolve such that for every advantage gained by the predator over a prey species, there is an adaptation by the prey species to avoid or minimize capture risks until another advantage is gained by the predator (i.e. evolutionary arms race [Dawkins, R. & Krebs, J.R.

1979]). In such a manner, extremely complex relationships exist within a given ecosystem, including between predator and prey species (Ricklefs 1997; Ricklefs and Miller 2000; Morrison et al. 2006).

In top-down regulated systems, the predator influences prey species density and distribution and in bottom-up regulated systems, forage and abiotic resources are the primary limiting factors, such that the prey species are limited only by the nutritional carrying capacity of the available habitat (Hunter and Price 1992; Estes 1995, 1996). In bottom up regulated populations, predation is a compensatory source of mortality but not what limits prey density and distribution. Both the top-down or bottom-up systems, are compliments of each other and in many situations the same populations of animals may be affected by both. Thus, when high quality habitat is abundant, ungulate populations may be influenced more by top-down forces of apex predators. However, ungulate populations may be more limited by habitat during poor nutritional times and predator populations may be more driven by bottom-up forces due to inadequate prey availability. As typical of most biological considerations, there is rarely a single limiting factor. Rather, there is a combination of structure, processes, and functions constantly varying not only seasonally, but over a longer time period.

Overly simplistic views of complex trophic relationships or focusing on a single predator-prey species relationship in an intertwined food web is risky and any human manipulations may result in consequences far beyond the focal link. Prey populations may crash naturally regardless of human attempts to manipulate predator abundance, especially if there are not enough food resources available to support them. Other considerations that may influence reproductive rates are availability and quality of food resources, short term weather events or climate change, and disease or other environmental stressors (Gasaway et al. 1992; NRC 1997; Lessard et al. 2005; Messier 2009; Terborgh and Estes 2010; Miller et al. 2011). Predator manipulations have not always improved reproductive rates, calf mortality, or calf recruitment of ungulates (Van Ballenberghe 1985; NRC 1997; Hayes et al. 2003; Valkenburg et al. 2004; Boertje et al. 2010).

### **3.2.1 Habitats**

There are approximately 120 million acres of forestland (land with >10% tree cover) in Alaska (Hutchison 1968), with the vast majority of forestland, about 107 million acres, occurring in Interior Alaska and is classified as boreal forest. This biome stretches from the Kenai Peninsula to the south slope of the Brooks Range (Vierick and Little 1972). Therefore, this is a predominant habitat type on refuges ranging from Kenai to Arctic.

Alaska also has vast areas that are covered with tundra. Tundra refers to a cold-climate landscape that has vegetation but is devoid of trees. The dominant plant species of tundra habitats are sedges, low and dwarf shrubs, and graminoids interspersed with forbs as well as nonvascular plants (ADF&G 2006).

Another habitat type found in Alaska is wetlands. Alaska's wetlands occupy 43.3% of the state's 403,247,700 acres. Wetland habitats are numerous and complex. The primary ecotype on Yukon Delta and Izembek refuge for instance, is primarily composed of wetlands. The Yukon-Kuskokwim Delta, found within the Yukon Delta refuge, is one of the world's largest coastal deltas, and supports several wetlands types.

In addition to wetlands, Alaska has several freshwater aquatic habitats, including glacial waters, clear waters, and riparian zones. The largest river in Alaska is the Yukon River, which flows through Yukon Delta refuge. It is also the third largest river in the North America. Rivers support many aquatic species including both anadromous and resident fish species. Lake Becharof, part of Alaska Peninsula/Becharof Refuge is one of the largest lakes in Alaska.

Refuges like Alaska Maritime and Kodiak contain long stretches of intertidal habitat – this occurs wherever the ocean meets the shore. The entire State of Alaska shoreline is 44,000 miles, more than double for the entire Lower 48 states (ACMP 2005). Many of these shorelines are managed by the refuge system. Other habitats would include rocky intertidal, mudflats and beaches and eelgrass beds. Izembek Lagoon, located on the tidelands and submerged lands of the Izembek State Game Refuge has the one of the largest eelgrass beds in the world. The adjacent Izembek Refuge protects the watershed of Izembek Lagoon.

Coastal islands and sea cliffs are another representative habitat found on refuges, in particular Alaska Maritime and Kodiak. Past and present volcanic activity shapes these islands, creating features such as calderas, craters, cone-shaped peaks, hot springs, ash falls, and lava flows. These habitat features provide excellent habitat for a myriad of seabirds and marine mammals.

### 3.2.2 Predators

For the following discussion and analysis, *predators* are identified as brown bear (*Ursus arctos*), black bear (*Ursus americanus*), wolf (*Canis lupus*), and coyote (*Canis latrans*) (nomenclature and taxonomy based upon MacDonald and Cook 2009). Below is a description of these four predators in Alaska.

#### 3.2.2.1 Brown Bear

Brown bears range throughout Alaska with higher densities occurring in coastal areas where access to salmon streams provides tremendous food resources. Inland areas generally have lower densities of brown bears where the primary foods are plants, berries, and prey species such as moose (*Alces alces*) and caribou (*Rangifer tarandus*). Brown bears are long-lived species with very low reproductive rates and high adult survival (Eberhardt et al. 1994, Hovey and McLellan 1996, NRC 1997). The oldest recorded brown bear was a sow from Kodiak Island that died at 34 years old (Schwartz et al. 2003). Brown bears are generally considered an apex predator and fill an important ecological niche in this capacity.

Brown bears are found on all Alaska refuges. Brown and grizzly bears are classified as the same species even though there are notable differences between them. Kodiak bears (brown bears from the Kodiak Archipelago) are classified as a distinct subspecies (*U.a.middendorffi*) from those on the mainland (*U.a.horribilis*) because they have been isolated from other bears since the last ice ages about 12,000 years ago. “Brown bears” typically live along the southern coast of the State where they have access to seasonally abundant spawning salmon. The coastal areas also provide a rich array of vegetation they can use as food. This allows them to grow larger and live in higher densities than brown bears that live in the northern and interior parts of the state. Brown bears are found throughout Alaska, except on islands south of Frederick Sound and southeast Alaska, west of Unimak, in the Aleutian Chain and Bering Sea islands. They are found on all refuges in Alaska.

Most brown bears are sexually mature at 5 years old; however, females generally first reproduce at 5 to 7 years of age (NRC 1997). The mating season is in the spring (May to July) and they are serial monogamous (have one mate at a time, but several each year). Cubs are born in the den during January and February. Generally, the average litter size ranges from 1 to 3 cubs, with twins being most common. The interval between births is 3 to 4 years with some areas in Alaska reporting more than 4 years between births. A sow and her cub(s) typically stay together for 2 to 3 years and after separation, female cubs tend to stay near where they were raised while males go farther afield. Adult survival rates average 92%, and varies with location, habitat, food availability, population density, and human harvest intensity (NRC 1997).

Brown bears are very adaptable and consume a wide variety of foods. Common foods include salmon, berries, grasses, sedges, cow parsnip, ground squirrels, carrion, and roots. In many parts of Alaska, brown bears are capable predators of moose and caribou, especially newborns. Bears may also be attracted to human camps and homes by improperly stored food and garbage as well as domestic animals.

Although generally solitary in nature, brown bears often occur in large groups in concentrated feeding areas such as salmon spawning streams, sedge flats, open garbage dumps or on whale carcasses. Because of this, they have developed a complex language and social structure to determine their boundaries and minimize serious fights. These feeding concentration areas also provide opportunities for people to watch bears.

Harvest of brown bears is managed in Alaska under both Federal subsistence and State general hunting regulations. Regulations require that bear meat, hide and skull be salvaged if harvested under the Federal Subsistence Program or under the State subsistence hunting program if hunting over bait. For all other sport/general hunts under State regulation, the hide and skull must be salvaged.

Brown bears are harvested for a multitude of reasons. Harvest of brown bears can be a result of traditional activities passed down through generations and can provide important food resources. Trophy harvest of large bears can also provide economic opportunities. Due to their reliance on high adult survival rate and their low reproductive capacity, harvestable brown bear populations must be managed conservatively and monitored closely for long-term population viability (Miller 1990; NRC 1997).

Hunting is allowed for brown bear if the harvest of adult female bears, as well as other year classes and sex, does not reach levels higher than the reproductive capacity of the bear population. Brown bear populations in proximity to villages, towns, and cities are often subject to higher rates of mortality from humans related to defense of life and property. This source of mortality must be factored into the management of overall human-caused mortality when regulating bear hunting for long-term health and survival of the population.

The State's IM program authorizes aerial shooting of bears by State agency personnel, same-day airborne take of bears by the public, and the baiting and snaring of any bear (no restrictions on age/sex). To date, IM activities have only been authorized on lands outside of Alaska Refuges.

State general hunting and trapping regulations currently apply on Alaska Refuges, unless further restricted by Federal law or regulation. Snaring of brown bears is not currently authorized under State general or Federal subsistence regulations.

Take of brown bears over bait was first authorized under State general hunting regulations during the 2012/2013 regulatory year in GMUs 12, 20C, 20E, and 21D. Currently, brown bear baiting is legal under State general regulations at a registered black bear bait station in GMUs 7 (Kenai Refuge), 12 (Tetlin Refuge), 13D, 15 (Kenai Refuge), 16, 20A, 20B, 20C, 20E, 21D (Koyukuk and Innoko Refuges), 24C and 24D (Koyukuk Refuge), and 25D (Yukon Flats Refuge). Same day airborne take of brown bears at a permitted bait station is also legal under State regulations within GMUs where baiting is authorized, provided that the person is at least 300 feet from the aircraft. Registered guides are authorized to operate up to 10 bait stations at a time in each designated guide use area. Restrictions on bait stations among other requirements include maintaining a minimum distance from roads, trails, public buildings, and campgrounds. The only restriction in State regulations on the type of bait used is that it must be biodegradable. This includes the parts of legally taken fish and game not required to be salvaged with the exception of GMUs 7 and 15 where fish and fish parts may not be used. People also commonly use human or pet food products to bait bears. The USFWS is asking specifically for comments on the type of allowable bait used to bait black and brown bears. Taking of brown bear over bait is also legal under Federal subsistence regulations in unit 25D (passed in spring of 2014).

The reported harvest of brown bears in 2013 by hunters receiving a State registration permit was 769 bears. This number includes some of the bears harvested by Federal subsistence hunters, as 10 of the 19 GMUs that have a subsistence priority for brown bears also require a state registration permit for all or portions of the federal public lands in that GMU. There are four GMUs that only require a federal registration permit and the reported harvest for those hunts was zero brown bears in 2013 and 29 between 2003 and 2013. There are also eight GMUs where there is no reporting requirement for subsistence hunters for all or a portion of the GMU. The state also manages three other classes of hunts for brown bears (Tier II, Drawing, and General Season). The drawing hunts are the only classification which hunting statistics are provided and the 2013 harvest was 183, bringing the total reported harvest to 952. This is just the reported harvest for these hunts and does not represent the total harvest for the State. Bear hunting seasons are held in both spring and fall in some areas but only in fall in other areas. Nonresident brown bear hunters are required to have a guide or be accompanied by an Alaska resident who is a relative.

### **3.2.2.2 Black Bear**

Black bears range over most of Alaska with the highest densities generally being in coastal areas. They are relatively long-lived species with unconfirmed reports of 30 year old bears being observed.

Black bears (*Ursus americanus*) are found throughout Alaska. They occur over most of the forested areas of the State, depending on the season of the year, they may be found from sea level to alpine areas. They are not found on the Seward Peninsula, on the Yukon-Kuskokwim Delta, or north of the Brooks Range. They are also absent from some of the large islands of the Gulf of Alaska, notably Kodiak, Montague, Hinchinbrook and others. They are also absent from the Alaska Peninsula south of the Lake Iliamna area. In Southeast Alaska, black bears occupy most islands with the exceptions of Admiralty, Baranof, Chichagof, and Kruzof (these are

inhabited by brown bears). Black bears are found on only 11 refuges in Alaska, an estimated 100,000 black bears inhabit Alaska.

For the most of the year, black bears are solitary creatures, except from June through July when mating takes place. They have slightly higher reproductive rates (.55 to 1 cub per year versus .45-.85 cubs per year for brown bear) and lower annual adult survival rates than brown bears. Black bears age at first reproduction is 3 to 6 years (NRC 1997, Bertram and Vivion 2002). Litter sizes vary from 1 to 5, with 2 being the average. The inter birth interval is generally 2 to 3 years with an annual adult survival rate averaging 86% versus the 92% reported for brown bears, depending on habitat quality, population density, and human harvest levels (NRC 1997; Bertram and Vivion 2002). The cubs are born in dens following a gestation period of about seven months. The cubs are born blind and nearly hairless, weighing under a pound. Cubs remain with their mothers through the first winter following birth. In the more southern parts of their range, bears will breed every other year; however, if a litter is lost early during the first summer, the sow will breed again that year. In more marginal environments such as northern Alaska, black bears keep their cubs with them an extra year and will breed every third year.

Black bears are opportunistic. There are certain patterns of food-seeking which they follow. Upon emerging in the spring, freshly sprouted green vegetation is their main food item, but they will eat nearly anything they encounter. Winter-killed animals are readily eaten, and in some areas black bears have been found to be effective predators on newborn moose calves. As summer progresses, feeding shifts to salmon if they are available, but in areas without salmon, bears rely on vegetation throughout the year. Berries, especially blueberries, ants, grubs, and other insects help to round out the black bear's diet.

Black bears are harvested under both Federal subsistence and State general hunting regulations. They are valued for both their meat and pelts. From 2003 to 2007, statewide harvest averaged about 2,800 bears annually (ADF&G [http://www.adfg.alaska.gov/static/home/library/pdfs/managing\\_alaskas\\_wildlife.pdf](http://www.adfg.alaska.gov/static/home/library/pdfs/managing_alaskas_wildlife.pdf). 2015). Depending on the GMU and season, the State requires that the meat, hide, and/or skull be salvaged. The State's IM Program authorizes aerial shooting of bears by State agency personnel, same-day airborne take of bears by the public, and baiting and snaring of any bear (no restrictions on age/sex); however, these activities have only been authorized outside Alaska refuges to date. Black bear generally occur in fairly high densities in coastal areas and while hunter harvest can be high, situations of overharvest have rarely been documented. However, a recent example of apparent overharvest prompted the State to close the Spring black bear hunting season 2 weeks early in GMU 6D in response to shrinking harvest rates and a high female harvest (ADF&G <http://www.adfg.alaska.gov/static/applications/webintra/wcnews/2015/releases/02-27-2015.pdf>. 2015).

State general hunting and trapping regulations currently apply on all refuges in Alaska, unless further restricted by Federal law or regulation. The State classifies black bears as big game and as furbearers, which allows for trapping bears and sale of their hides and skulls. However, snaring of black bears is not currently authorized under State general or Federal subsistence regulations, only under IM.

Taking of black bears over bait under State general hunting regulations has been authorized since the early 1980's. Taking of black bear is legal under State general hunting regulations at a registered bait station in most of the GMUs where the species occurs throughout the State. Same day airborne take of black bears at a permitted bait station is also legal under State regulations within GMUs 7 (Kenai Refuge), 9 (Izembek, Alaska Peninsula, and Becharof Refuges), 11, 12 (Tetlin Refuge), 13, 14, 15 (Kenai Refuge), 16, 17 (Togiak Refuge), 19 (Yukon Delta), 20, 21 (Yukon Delta, Koyukuk, Nowitna, and Innoko Refuges), 24 (Kanuti and Koyukuk Refuges), and 25 (Arctic and Yukon Flats Refuge), provided that the person is at least 300 feet from the aircraft. Registered guides are allowed to operate up to 10 bait stations at a time in each guide use area. There are restrictions on these bait stations, including distance from roads, trails, and public buildings and campgrounds, among other requirements. The regulations specify that all bait must be biodegradable and must be completely removed at the end of the season. Hunters commonly use parts of fish and game that are not required to be salvaged when these species are harvested, as well as human and pet food products. In GMUs 7 and 15 fish and fish parts are prohibited to reduce attractants preferred by brown bears.

State general hunting and trapping regulations prohibit taking cubs or sows accompanied by a cub(s). However, there are several exceptions to this prohibition that are authorized. For example, black bear cubs or sows accompanied by cubs, may be taken by resident hunters under customary and traditional use activities at den site October 15-April 30 in Unit 19A (small portion of Yukon Delta Refuge), Unit 19D upstream from the Selatna and Black River drainages, Units 21B, C, D (Koyukuk, Nowitna, and Innoko Refuges), and Unit 24 (Kanuti Refuge). In Unit 25D (Yukon Flats Refuge) black bear cubs and sows accompanied by cubs may be taken year round.

### 3.2.2.3 Wolf

Wolves are found throughout most of the State, with the exception of a few islands in southeast and south central Alaska, Kodiak Island and the Aleutian Island chain beyond Akun Island which is 26 miles west of Unimak Island. Wolves currently inhabit 15 of the 16 refuges in Alaska (not present on Kodiak Refuge). Wolves occur in a wide variety of habitats across the State. Wolves' densities vary spatially relative to several factors, primarily the abundance of ungulate prey (Mech 1970; Mladenoff et al. 1995; Ciucci et al. 2003). Densities can range from 2 wolves per 1000 km<sup>2</sup> to 20 wolves per 1000 km<sup>2</sup> or higher in multi-prey species systems (Fuller 1989; Stephenson et al. 1995; NRC 1997).

Wolf population abundance is often strongly correlated with ungulate prey population abundance (Mech 1977, 1986; Messier and Crete 1985; Peterson and Page 1988; NRC 1997). This correlation does not factor in human harvest. These predator-prey dynamics may be different where there are migratory or seasonally abundant prey, as well as habitats where alternate prey sources exist when the preferred prey is absent or depleted (Mech 1977, 1986; Messier and Crete 1985; Peterson and Page 1988; NRC 1997). Typically, one female wolf in a pack has a litter of about seven pups each year; however, in some packs more than one female will have a litter. In some cases, a pair of wolves may not form a pack or belong to a pack, and will have a litter of pups.

Wolves are opportunistic generalist carnivores and in most inland areas of Alaska, ungulates including moose and/or caribou are their primary food, with large and small rodents (Kohira and Rexstad 1997, Darimont et al. 2004), birds (Fuller and Keith 1980), fish (Kohira and Rexstad

1997, Darimont et al. 2003), fruit (Cuesta et al. 1991), inter-tidal organisms (Klein 1995), and carrion (Forbes and Theberge 1992) as typical supplements in the diet. Fish and marine mammals constitute an important component of the diet for wolves living in maritime climates in Alaska (Watts et al. 2010). The rate at which wolves kill large mammals varies with prey availability and environmental conditions. At other times, they may go for several days with almost no food. Since wolves are opportunistic, young, old, or debilitated animals are preyed upon more heavily than healthy middle-age animals. However, under some circumstances, such as when snow is unusually deep or prey is scarce, even animals in their prime may be vulnerable to wolves.

In Alaska, wolves are classified as both big game and furbearers. Hunting and trapping of wolves is legal under both Federal subsistence regulations and State general hunting and trapping regulations, although seasons and bag limits vary greatly by GMU and method of harvest. For the GMUs that encompass refuges, State general hunting regulations allow for the take of: 5 wolves from August 10 – April 30 in GMU 7 (Kenai Refuge), 10 wolves per day from August 10 - June 30 in GMU 9 (Izembek and Alaska Peninsula/Becharof Refuges), 10 wolves per day from August 10 - June 30 in GMU 10 (Alaska Maritime Refuge), 10 wolves from August 10 - May 31 in GMU 12 (Tetlin Refuge), 5 wolves from August 10 - April 30 in GMU 15 (Kenai Refuge), 10 wolves per day from August 10 - April 30 in GMU 17 (Togiak Refuge), 10 wolves from August 10 - April 30 in GMU 18 (Togiak, Alaska Maritime, and Yukon Delta Refuges), 10 wolves from August 10 - May 31 in GMU 19 (Yukon Delta Refuge), 10 wolves from August 10 - May 31 in GMU 21 (Yukon Delta, Innoko, Koyokuk, and Nowitna Refuges), 20 wolves from August 1 - May 31 in GMU 22 (Yukon Delta Refuge), 20 wolves from August 1 - April 30 in GMU 23 (Selawik and Alaska Maritime Refuges), 10 wolves from August 10 - May 31 in GMU 24 (Kanuti and Koyukuk Refuges), and 10 wolves from August 10 - May 31 in GMU 25 (Yukon Flats Refuge).

Hunters and trappers harvest about 1,300 wolves in the state annually, with 35% of those harvested by shooting from the ground under a hunting or trapping license (ADF&G 2013). Wolf harvest levels vary in response to fur prices and harvest regulations. Annual harvest from 2001-2013 ranged from 1063 to 1811 wolves.

### 3.2.2.4 Coyote

Coyotes are unevenly distributed across much of Alaska and across many of the 16 refuges in Alaska, especially in the interior (MacDonald and Cook 2009). Coyotes are a recent immigrant to Alaska, having appeared in southeast Alaska in the early 1900s and thereafter expanded north and west throughout the interior and southern parts of the state (MacDonald and Cook 2009). Populations peaked in the mid-1900s and declined in many areas since (ADF&G 2015a).

Coyotes form a strong pair bond. The typical social structure is a mated pair and offspring and most offspring disperse in the first year. In Alaska, coyotes are found mostly as mated pairs with an established territory. Lone coyotes are not unusual, but are generally transients without established territories. Packs of coyotes are unusual in Interior Alaska.

A mated pair of coyotes may stay together through the spring and share parental duties after the pups are born. Other coyotes, especially young of the previous years, may also help care for the pups. Shortly before pupping, one or more dens are prepared for the litter. Coyotes give birth to an average of five to seven blind and helpless pups. The size of the litters varies in response to

the food supply. Litters born when prey is more available will, on average, be larger than those born when food resources are scarce.

Coyotes are generalist carnivores and consume a wide variety of prey items (Bekoff 1977). However, given a specific habitat or prey resources, coyotes can act as selective predators as demonstrated by a 10-year study in the Yukon that found that coyotes did not switch from their primary food source, snowshoe hares, to alternative prey when hare numbers declined (O'Donoghue et al. 1998). In Alaska and Northern Canada, snowshoe hares are generally the primary prey of coyotes (O'Donoghue et al. 1997).

Hunting and trapping of coyotes is legal in Alaska under both Federal subsistence regulations and State general hunting and trapping regulations; however, harvest limits and seasons vary by GMU. Under State general hunting regulations there is no limit and no closed season for coyotes in most GMUs (i.e., GMUs 6-17, 19-21, and 23-26) that include refuges. Harvested coyotes are not required to be sealed under current State regulations so harvest data is limited to hunter/trapper questionnaires. The most recent harvest report (ADF&G 2013) estimated an annual harvest of 324 coyotes in the project area (all except Southeast Alaska).

There is no documented populations and trends information, and little harvest information available to accurately describe the current status of coyotes in Alaska. There are no sealing or reporting requirements for trapped or hunted coyotes, but based on the 2012-2013 Trapper Questionnaire a total of 326 coyotes were harvested by trappers statewide (ADF&G 2013). The other detectable number is the Raw Fur Skin Export Permit required for individuals and fur dealers to export furs from Alaska. The 2012-13 report indicated that 386 coyotes were shipped from Alaska (ADF&G 2013).

### 3.3 Subsistence

In Alaska the term “subsistence” refers to the living traditions of hunting, trapping and fishing, and collecting through which rural Alaskan communities, many of them predominantly Alaska Native, continue to derive a significant portion of their food from local resources. The subsistence way of life refers to food production, cooperative labor, sharing practices, and traditional cultural beliefs. The interplay of Federal and State statutes and the effects of Federal and State court decisions make for a complex regulatory framework related to subsistence in Alaska.

Section 803 of ANILCA defines subsistence uses as:

The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of inedible by-products of fish and wildlife resources taken for personal or family consumption; for barter or sharing for personal or family consumption; and for customary trade (16 U.S.C. § 3113).

Subsistence is central to the livelihood of many Alaska Native communities and other rural residents. The patterns of subsistence harvests are shaped by local and regional factors of ecology, community history, culture, and economy. What is termed “subsistence” in law is, on the ground, a myriad of distinct, localized traditions established by communities (Wolfe 2004).

The subsistence patterns of local communities can include extensive ecological knowledge, effective harvest techniques, traditions for cooperation and sharing, and cultural ceremonial activities. A wide array of natural resources are harvested throughout the year in a regular cycle of seasonal efforts timed for availability, access, and condition of the resources. The composition of subsistence harvests includes many species of fish, land mammals, marine mammals and invertebrates, terrestrial invertebrates, waterfowl, berries, plants, and firewood gathering. People rely on these locally available resources for food, clothing, fuel, transportation, construction, art, crafts, exchange, and customary trade (Wolfe 2000).

The use of traditional food in the subsistence lifestyle provides important benefits to users. Subsistence foods are often preferable as they are rich in many nutrients, lower in fat, and considered healthier than purchased foods. Subsistence harvesting of traditional foods, including preparation, eating, and sharing of resources, contributes to the social, cultural, and spiritual well-being of users and their communities (ISER 2010). Based on census data collated by Wolfe and Fischer (2003), wild food harvests (pounds per person per year) in the areas that are co-located with refuges ranged from 169 pounds in Kodiak Island Borough to 698 pounds for the Wade Hampton census area.

The regulatory framework for subsistence management in Alaska is based on ANILCA Title VIII (“Subsistence Management and Use”). Title VIII establishes a preference for subsistence uses, including the taking of fish and wildlife for non-wasteful purposes on federal public lands in Alaska. Section 803 of ANILCA defines the term subsistence uses and that definition is incorporated here by reference. Under ANILCA, all refuges in Alaska are mandated to provide the opportunity for continued subsistence use by local rural residents, as long as this use is consistent with the conservation of fish and wildlife populations and habitats in their natural diversity and fulfilling the international treaty obligations of the United States with respect to fish and wildlife and their habitats. Taking of fish and wildlife by non-Federally qualified subsistence users can be, and has been, restricted on federal public lands, in accordance with the framework provided under Federal subsistence regulations (36 CFR 242 and 50 CFR 100). In addition, current refuge regulations (50 CFR 36.16) allow the Refuge Manager, after holding a public hearing in the affected area, to temporarily close all or a portion of a refuge to subsistence uses if necessary for reasons of public safety, administration, or for continued viability of a fish or wildlife population.

The Federal Subsistence Management Program is a multi-agency effort to provide the opportunity for a subsistence way of life by rural Alaskans on federal public lands and waters while maintaining healthy populations of fish and wildlife. The program provides for public participation through the Federal Subsistence Board (FSB) and 10 Regional Advisory Councils (RACs). The FSB is the decision-making body that oversees the program and administers the subsistence taking and uses of fish and wildlife on Federal public lands. It is made up of the regional directors of the USFWS, National Park Service, Bureau of Land Management, Bureau of Indian Affairs and U.S. Forest Service. Three public members (one of whom serves as chair) are appointed by the Secretary of the Interior with concurrence of the Secretary of Agriculture. The RACs provide recommendations and information to the Board; review proposed regulations, policies and management plans; and provide a public forum for subsistence issues. Each regulatory cycle, any person or group can submit proposals to the FSB to change Federal subsistence season dates, harvest limits, methods and means of harvest, or customary and

traditional use determinations. In addition, any person or group can comment on proposals or testify at RAC meetings or at a FSB meeting.

Section 802 of ANILCA states that “consistent with sound management principles, and the conservation of healthy populations of fish and wildlife...the purpose of this title is to provide the opportunity for rural residents engaged in a subsistence way of life to do so...” The USFWS continues to recognize subsistence uses of fish and wildlife and other renewable resources as the priority consumptive use on refuges in Alaska. Federal regulations at 50 CFR 100 and 36 CFR 242 describe allowable Federal subsistence activities on refuges and other Federal public lands.

### 3.4 Public Use

ANILCA Title III, area CCPs, Public Use Management Plans, and public use regulations for Alaska refuges specify the public uses to be managed for and protected in each refuge. As noted above, the sport/general hunting, trapping, and fishing and subsistence take of fish and wildlife shall be allowed under applicable Federal laws and regulations and non-conflicting State laws and regulations. Guided general hunting permits are offered in all refuges in Alaska. The Improvement Act states that the following wildlife-dependent recreational uses are compatible with the NWRS: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. These uses are the priority general public uses of the NWRS and will receive priority consideration in refuge planning and management over all other general public uses.

The CCPs developed for Alaska refuges (USFWS 1985 through 2015) describe in more detail the public access and facilities needed to meet public use objectives. In addition, visitor use information for Alaska refuges is available in the CCPs. In general, public visitation on refuges in Alaska ranges from a low number of visits for the relatively remote refuges, to thousands of visitors per year for the Kenai refuge. Visitor participation, as reported in the Service’s Refuge Annual Performance plan (RAPP) for Fiscal Year 2014, for priority general public uses can be characterized as follows: total hunting visits 108,174; fishing visits 326,918; total wildlife observation visits 1,493,076; number of photography participants 139,394; number of education participants involved in on- and off-site environmental education programs 18,776; number of interpretation participants in on-and off-site talks/programs 51,838; and total other recreational participants 145,410.

Guiding for hunting is a permitted commercial use on refuges in Alaska. Presently, there are a total of 56 guides operating on refuges in Alaska. A total of 93 permits are available. Several guides have more than one guide use area. The breakdown is as follows:

Alaska Maritime- 4; Alaska Peninsula -14; Arctic- 9; Becharof- 3; Innoko- 1; Izembek- 7; Kanuti- 1; Kenai- 4; Kodiak- 13; Koyukuk- 2; Nowinta-2; Selawik- 1; Tetlin- 2; Togiak- 3; Yukon Delta- 3; and Yukon Flats- 2 (USFWS files). The following is a list of public use facilities found on Alaska refuges:

- Kenai Refuge Visitor Center, grand opening was on May 30, 2015.
- Kenai Refuge Public Use Cabin program has 14 cabins and associated trails, facilitates and restrictions.

- Kenai Refuge Swan Lake and Swainson River Canoe system. National designation trail system with 140 miles of water and portage trails.
- Kenai Refuge hiking trail system includes 110 miles of trails.
- Kenai Refuge has 12 campgrounds and associated facilities with a combined 120 RV and tents sites.
- Kodiak Refuge Public Use Cabin program has 9 cabins and associated trails and facilities.
- Izembek Refuge has a road system with interpretive pullouts and waysides, which include the Grant Point Observatory and various informational kiosks.
- Tetlin Refuge Public Use Cabin program has 3 cabins and associated facilities and restrictions.
- Tetlin Refuge Visitor Center is near the Canadian Border at mile 1224 of the Alaska Highway.
- Tetlin Refuge maintains two campgrounds (Deadman Lake and Lakeview campgrounds).
- Tetlin Refuge offers a photo blind at the Lakeview Campground
- Tetlin Refuge hiking trail to Hidden Lake offers wildlife viewing and fishing.
- Nowitna Refuge operates hunter check station on the Nowitna River (September to October).
- Alaska Maritime Refuge manages the Alaska Islands and Ocean Visitor Center in Homer, Alaska.
- Alaska Maritime Refuge offers informational kiosks on Unalaska, Adak, St. Paul, and St. George Islands.
- Becharof Refuge includes a national designated trail; the Kanatak Trail, that is 5-miles long and travels a historic route across the Alaska Peninsula mountains from Bristol Bay to the North Pacific Ocean.

### 3.5 Wilderness

The Wilderness Act mandates that “each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area (Section 4(b)).” Section 2(c) defines wilderness:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces

of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

### 3.5.1 Wilderness Character and Values

The Wilderness Act Section 4(b) describes the primary direction for wilderness stewardship as "each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area." The USFWS Wilderness Stewardship Policy (USFWS 2008d) notes that to preserve wilderness character, both the tangible and intangible aspects of wilderness must be maintained. Wilderness character increases as it approaches the highest measure of natural conditions and being "untrammelled." For the USFWS, these tangible and intangible aspects of wilderness include:

- Maintaining the natural and scenic condition of the land. Providing environments for native plants and animals, including those threatened or endangered;
- Maintaining watersheds and air sheds in a healthy condition;
- Maintaining natural night skies and soundscapes;
- Retaining the primeval character and/or influence on the land;
- Serving as a benchmark for ecological studies; and
- Providing opportunities for solitude, primitive, and unconfined outdoor recreation, risk, adventure, education, personal growth experiences, a sense of connection with nature and values beyond one's self, a link to our American cultural heritage, and mental and spiritual restoration in the absence of urban pressures.

Wilderness character is influenced by the cumulative effect of a myriad of threats and actions. The U.S. Forest Service published *Keeping it Wild: An Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System* (Landres et al. 2008) that links indicators and measures to the Section 2(c) definition of wilderness. From this section of the Wilderness Act, the Committee arrived at interpretations of the 4 qualities of wilderness. These qualities, as stated in the Wilderness Act of 1964, coincide with the aspects of wilderness character identified by the USFWS (USFWS 2008d):

- "Untrammelled" – wilderness is unhindered and free from modern human control or manipulation.
- "Natural" – wilderness ecological systems are substantially free from the effects of modern civilization.
- "Undeveloped" – wilderness is substantially without permanent improvements or modern human occupation.
- "Outstanding opportunities for solitude" – wilderness provides opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenges.

These four qualities of wilderness character are commonly used to assist wilderness managers with planning, management, and monitoring activities within scientific and peer-reviewed literature (Hendee and Dawson 2002; Landres et al. 2008; Hall et al. 2010). They mutually

reinforce each other and together can comprise an approximation of wilderness character for the purposes of assisting monitoring and management efforts on these lands.

#### **3.5.1.1 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 non-native plants or animals) (USFWS 2008d).

#### **3.5.1.2 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 untrammeled, 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 species) (USFWS 2008d).

#### **3.5.1.3 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 (USFWS 2008d).

#### **3.5.1.4 Outstanding Opportunities for Solitude and Primitive and Unconfined Recreation**

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 (USFWS 2008d).

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 non-motorized 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 (USFWS 2008d).

ANILCA added approximately 56 million acres of Alaska public lands into the National Wilderness Preservation System. Ten of the 16 refuges in Alaska have some acreage as designated wilderness (Figure 1).

## 4.0 Environmental Consequences

This section provides an evaluation of the potential effects or impacts of each of the alternatives on refuge resources. As stated in the introduction, the USFWS is analyzing the effects to four resource areas (wildlife and habitats, subsistence, public use, and wilderness).

### 4.1 Introduction

The direct, indirect, and cumulative impacts are described for impact to each resource area selected for analysis. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8). Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR § 1508.8).

### 4.2 Effects Analysis Factors and Ratings

#### Intensity

- Low: A change in a resource condition is perceptible, but it does not noticeably alter the resource's function in the federal lands ecosystems, cultural context, or visitor experience.
- Medium: A change in a resource condition is measurable or observable, and an alteration to the resource's function in the federal lands ecosystems, cultural context, or visitor experience is detectable.
- High: A change in a resource condition is measurable or observable, and an alteration to the resource's function in the federal lands ecosystems, cultural context, or visitor experience is clearly and consistently observable.

#### Duration

- Temporary: Impacts would last only a single season or for the duration of discreet activity, such as construction of a trail (generally less than two years).
- Long-term: Impacts would extend from several years up to the life of the plan.
- Permanent: Impacts are a permanent change in the resource that would last beyond the life of the plan even if the actions that caused the impacts were to cease.

#### Context

- Common/Local: The affected resource is not rare and not protected by legislation. The portion of the resource affected does not fill a unique role. Impact would

occur only at a limited site or immediate surroundings and would not extend into the region.

**Important/Regional:** The affected resource is protected by legislation or is rare within the locality or region. The portion of the resource affected does not fill a unique role within the locality or region. Impact would affect the resource at a regional level, extending well beyond the initial impact site.

**Unique/Statewide:** The affected resource is protected by legislation and the portion of the resource affected uniquely fills a role within the locality or the region. Impact would affect the resource on a state-wide or national level, extending well beyond the region.

One of the shared purposes of Refuges in Alaska, outlined in Appendix A, include conservation of fish and wildlife populations and habitats in their natural diversity. While this is part of the legislative context, the rating of context must also take into account whether the species affected fills a unique ecological role in the locality or region. Where a resource is widespread throughout Alaska, the context will be rated as common. However, if a species is protected by statute, such as the Endangered Species Act, or if the population affected fills a unique ecological role, then the rating would be important or unique.

#### 4.2.1 Summary Impact Levels

Summaries about the impacts on the resource synthesize information about context, intensity, and duration, which are weighed against each other to produce a final assessment. While each summary reflects a judgment call about the relative importance of the various factors involved, the following descriptors provide a general guide for how summaries are reached.

**Negligible:** Impacts are generally extremely low in intensity (often they cannot be measured or observed), are temporary, and do not affect unique resources.

**Minor:** Impacts tend to be low intensity or of short duration, although common resources may have more intense, longer-term impacts.

**Moderate:** Impacts can be of any intensity or duration, although common resources are affected by higher intensity, longer impacts while unique resources are affected by medium or low intensity, shorter-duration impacts.

**Major:** Impacts are generally medium or high intensity, long-term or permanent in duration, and affect important or unique resources.

#### 4.2.2 Cumulative Effects

**Cumulative effects** are the impacts on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR § 1508.7). In the sections below, the USFWS analyzes the impacts to four resource areas.

## 4.3 Wildlife (Terrestrial Mammals) and Habitats

### 4.3.1 No Action Alternative (Alternative 1)

#### 4.3.1.1 Direct and Indirect Effects

The recent predator harvest liberalizations under State regulations on refuges in Alaska may have population-level effects on targeted predators because anticipated additional harvest, while unknown, may be high (Terborghand and Estes 2010; Ripple et al. 2014). Localized effects on individual animals, family groups, and packs will be substantial (e.g., direct mortality, increased mortality risk due to loss of family or group members, and food conditioning). The legalization of the take of brown bears over bait, take of wolves and coyotes (including pups) during the denning season, same-day airborne hunting of wolves and bears, trapping and snaring of bears and the sale of their skulls and hides, as well as the expansion of season lengths and increased bag limits, reverse many long-standing prohibitions on the take of predators in the State of Alaska. There are long-standing prohibitions for the harvest of predators, including the ones mentioned above, that are still in place in particular GMUs; however, proposals to lift some of these prohibitions have been and continue to be considered for the remaining other GMU's where they are not currently authorized. The trend of liberalization for predator harvest is likely to continue to expand into other GMU's that incorporate all Alaska refuges, since there is a lot of local pressure for increased harvest of predators.

The recent liberalizations of the State's general hunting and trapping regulations have direct implications for the management of refuges in Alaska. Predator-prey interactions represent a dynamic and foundational ecological process in Alaska's arctic and subarctic ecosystems, and are a major driver of ecosystem function (NRC 1997). Regulations or activities on Alaska refuges that are inconsistent with conserving fish and wildlife populations and their habitats in their natural diversity and maintaining biological integrity, diversity, and environmental health for the continuing benefit of current and future generations, are in direct conflict with our legal mandates for administering refuges in Alaska under ANILCA, Improvement Act, and Wilderness Act, as well as with several applicable agency policies (601 FW 3, 610 FW 2, and 605 FW 2). The increased effectiveness of take of predators is a concern due to the likelihood of negatively influencing populations numbers without a reliable and cost effective method of population monitoring, as well as the likelihood for additional unforeseen consequences to the species, habitats, processes, and interactions that occur on refuges which would not be consistent with the conservation of natural or biological diversity, biological integrity, or environmental health. Additionally, regulations or practices that allow for the hunting or trapping of wildlife when the harvested animals will not be used conflict with USFWS policy on administration of recreational hunting programs on refuges ( 605 FW 2). Such allowances violate a requirement under this policy to manage refuge hunting programs in a manner that promotes respect for the resource and are inconsistent with the guiding principles of refuge hunting programs, including the promotion of visitor understanding and appreciation for America's natural resources.

The prohibition of baiting for brown bears was first lifted during the 2012/2013 regulatory year. As a result, harvest of brown bears increased in some areas of Alaska and will likely continue to increase, which has the potential to decrease brown bear populations where it is implemented (ADF&G unpublished data 2015). Since this method of take has only been allowed for brown bears for the past couple years, there are only a few examples that demonstrate increased harvest.

Therefore, the long-term potential harvest, and resulting effects on populations, habitats, and ecological processes across the State also remain uncertain. Complicating this factor even more is the lack of current population estimates for this species across much of the State. A clear example of the increased effectiveness of this method was demonstrated in GMU 7. The 2013 harvest of brown bears in GMU 7 was 12 with a 198 day season. In 2014, brown bear baiting was added to approved methods and means and the resulting harvest with a 189 day season was 38 with 28 of those bears harvested over bait (ADF&G unpublished data 2015). This trend in increased harvest is likely to occur in other areas of the State because there is public interest in baiting throughout Alaska, including refuges. In February 2015, the BOG reviewed 11 proposals to add additional areas where baiting of brown bears would be legal; a fall brown bear baiting season; and proposal to remove the meat salvage requirement for brown bears taken over bait (ADF&G 2015b).

Brown bears generally have low population densities, reproductive rates, and high adult survival, making them susceptible to over-harvest. This is especially problematic in the absence of careful monitoring of population numbers and ecological function of the landscape. Currently, the cost and ability to produce brown bear population estimates has and will continue to hamper effective monitoring (Garshelis 1990; Miller 1990; Miller et al. 1997; Reynolds et al. 2011). The inability to detect population declines in brown bear associated with more efficient harvest methods will likely lead to a reduction in some populations on refuges in Alaska. Additionally, reductions in brown bear populations would likely be long-term. Miller (1990) calculated that brown bear populations that had been reduced by 50% would require 10 years with no hunting to restore them. Black bear populations would be expected to recover more quickly than brown bears based on slightly higher reproductive rates (Miller 1990).

Inadvertently, there is a potential for baited bears to become human habituated and food-conditioned. While there have been few studies that linked baiting for brown bears to increases in bear attacks on humans, there are studies documenting an increase in negative bear-human encounters when bears become food conditioned and tolerant of humans (Herrero 1985; Smith et. al 2005). Because take of brown bears over bait has only been legal in Alaska since 2012, there has been insufficient time to document resource problems associated with this activity. Previous information on food conditioning and human habituation provides evidence that indirect problems associated with these methods are likely to occur at some level. There is also potential for higher instances of defense of life and property mortalities associated with food and human conditioned bears.

Currently, same day airborne take of bears is authorized under State regulations in most GMU's where they can be harvested at bait stations. Same-day airborne take of black and brown bears will likely increase harvest pressure and reduce bear populations because it allows the ability to observe bears from the air, land and harvest the animal that same day, which provides a large advantage over a person on the ground dealing with limited visibility. With the inability to closely monitor populations, the likelihood for an undetected significant reduction in bear populations exists.

Changes in adult female bear survival drive bear population dynamics (McLellan 1999, VanDaele 2007). For this reason, most states, including Alaska, have harvest regulations which allow more liberal harvest of males than females. Adult female survival rates (in harvested

populations) have been shown to be higher than adult male survival rates, and this finding was attributed to reduced vulnerability of sows with cubs in hunted populations (Schwartz and Franzmann 1991, Sellers 1994, McLellan 1999). In Alaska, hunting of sows and cubs has mostly been limited to predator control areas, where the intention is to significantly reduce bear population numbers. There is an allowance under State general hunting regulations for the take of black bears, including sows with cubs and cubs, by resident hunters from a den site from October 15 – April 30 (year-round in Unit 25D) for customary and traditional use in interior Alaska. Allowing cubs, and sows with cubs, to be harvested under general hunting regulations year-round or outside of customary and traditional uses will likely have the consequence of reducing the overall bear population. This would be a high intensity impact as ecological function of a top predator would be reduced and the effects would be considered long-term due to life strategies of these species. Black bear populations would be expected to recover more quickly than brown bears based on slightly higher reproductive rates (Miller 1990).

Trapping and snaring of bears has only been approved by the BOG under the implementation of IM, but has been considered as an option under general hunting and trapping regulations. In 2010, black bears were added to the classification of furbearer under State regulations, making trapping and snaring an approved method of take where allowed in specific GMUs. For this reason it is included in this analysis, though there are currently no refuges in Alaska open to harvest of bears using traps or snares (5 AAC 92.900.32). Due to the non-selective nature of these methods, it is anticipated that cubs and sows with cubs would be captured or injured. This will have a high impact to the bear population by removing the reproductive capacity of the population and the effect will be long-term due to the relatively slow reproductive rate for black and brown bears. Trapping and snaring of bears has the potential to injure target species and injure or kill non-target species even when conducted by experienced researchers (Kaczensky 2002).

Direct impacts to wolf populations under Alternative 1 would likely be moderate dependent on the existing hunting regulations and relative harvest pressure on those refuges in GMUs with longer hunting seasons. There are currently 12 refuges within 7 GMUs that would be affected by the State regulations for wolf and coyote harvest under Alternative 1. The longer duration hunting seasons coinciding with the normal spring and summer wolf denning seasons would likely increase direct mortality and reduced pup survival, reproduction and territorial social groups in those affected Refuges (Brainerd et al. 2008).

Low intensity direct impacts could also be anticipated under Alternative 1 for coyotes on refuges in Alaska. Currently coyote hunting is open year round with no bag limit on all refuges in Alaska with the exception of portions of Yukon Delta, Alaska Maritime and Togiak Refuges in GMUs 2, 18 and 22 where the season is September 1 – April 30 and bag limit is two coyotes. Under Alternative 1, year round coyote hunting would still be allowed on most refuges thereby directly affecting overall populations of coyotes.

Alternative 1 would likely result in localized reductions of the primary top predator populations, specifically wolf or bears. This would be an indirect effect to these populations and the ecosystems they inhabit. It may trigger a trophic cascade or a mesopredator release by either increasing competition or reducing it among subordinate predators (e.g., coyote, Canada lynx, wolverine), or ungulates and their food resources (Messier 2009; Ripple et al. 2010).

Reducing top predator populations may alter the natural rise and fall of predator and prey populations at periodic intervals dictated by intrinsic population growth (rates of pregnancy, calf survival, herd recruitment, herd social dominance, etc.) and influenced by predation and other environmental factors (Darling 1937; Lack 1954; Caughley 1977; Clutton-Brock et al. 1982; Emlen 1984; Gotelli 2001; Danell et al. 2006). Intensive management of predators may preclude ungulate populations from declining to a point that they are below the threshold of detection through current monitoring methods and techniques, or actually become locally extirpated (ADF&G 2011). Predation would likely not be the primary limiting factors for ungulates along with other limiting environmental factors such as weather events, disease, parasites, etc. (Hassell 1976; Caughley 1979; Taylor 1984; McNab 1985; Dhondt 1988; Pulliam 1988; Crawley 1992; Estes et al. 2001; Gese and Knowlton 2001; Barbosa and Castellanos 2005; Terborgh and Estes 2010). The loss of these ecological processes would be a high intensity impact and would be considered long-term in nature due to the length of time required for recovery.

A potential indirect effect of increased wolf harvest and mortality is the potential for the expansion of coyote range and increases in coyote numbers in those affected areas (Berger and Gese 2007). Coyotes have a different predator/prey relationship and ecological role which could also lead to additional indirect effects on overall ecosystems as well as individual prey species, for example, increased predation on Dall sheep lambs by coyotes (Arthur 2003).

Human harvest of ungulates may influence herd sex ratios and social dominance hierarchy of those populations. (Reynolds et al. 2001; Mysterud et al. 2002; McLoughlin et al. 2005; Milner et al. 2007; Proaktor et al. 2007; Bischof et al. 2008; Allendorf and Hard 2009). Additionally, harvest pressure may influence population distribution and densities locally (McShea et al. 1997; Reimers and Colman 2006; Beale 2007; Padilla 2010).

In addition to population dynamics and predator-prey effects, managed predator reductions to benefit prey can contribute to varied outcomes including increased prey numbers over the short-term, reduced local habitat quality, signs of nutritional stress in prey, and range shifts. Some of these outcomes have been recently seen in the Forty-Mile Caribou Herd where the herd has doubled in size over the past 10 years. The Forty-Mile Herd is now showing signs of nutritional stress (fewer 3 year old cows are getting pregnant, and lower calf weights). ADF&G biologists are reporting signs of overgrazing in the herd's core range. A high percentage of the herd shifted their winter range much further east into Canada and spent most of the winter there (Boertje et al. 2012).

#### **4.3.1.2 Cumulative Effects**

Abundant research has been conducted on the myriad of factors influencing carnivore populations (both generally and for wolves and bears specifically). Climate change, fire, unreported harvest, increased access, habitat fragmentation and degradation, contaminants, disease, and development all have the potential to impact predator abundance at the population level across varying temporal scales and influence natural ecosystems and processes (McLellan and Shackleton 1988; McLellan and Shackleton 1989; McLellan 1990; Mace and Waller 1997; McLellan et al 1999; Vucetich et al. 2005; Creel and Rotella 2010; Gude et al. 2012; and Schwartz et al. 2012).

Predators are one of many potential limiting factors that can affect ungulate populations in a complex ecological system. Effects of other natural events or processes, as well as effects of

anthropogenic actions on the full system and underlying processes must be considered. For example, events such as wildfires, climate, and severe winters (i.e. deep snows or icing events), can impact habitat quality of ungulates, affect recruitment, and cause direct mortality of individuals (Weixelman et al. 1998; MacCracken and Viereck 1990; Joly et al. 2003, 2009, 2011, 2012; Hegel et al. 2010a). These effects contribute to the impacts of predation on ungulates and ungulate numbers, in turn, are linked to prey available for predators (Hegel et al. 2010a; Hegel et al. 2010b). Likewise, unreported take, habitat fragmentation and degradation, contaminants, disease, development, and other associated effects as a result of climate change all have the potential to impact wildlife populations (including ungulates and other prey species) across varying temporal and spatial scales, as well as to influence natural ecosystems and processes.

Limiting factors affecting habitats and wildlife populations outside refuge boundaries and source-sink dynamics are a management concern for predators and ungulates alike, particularly on the border of protected areas and areas of less restrictive harvest (Haroldson et al. 2004; Salinas et al. 2005; Schwartz et al. 2006; Rutledge et al. 2010; Ruth et al. 2011; Schwartz et al. 2012). When striving to maintain natural processes, some consideration of the effects of anthropogenic management perturbations on an entire suite of species, their interactions, trophic cascades, and system stability is required (Ruth et al. 2004; Evans et al. 2006; Barber-Meyer et al. 2008; Beschta and Ripple 2010; and Ripple et al. 2014).

Climate change, invasive species, habitat destruction and degradation, increase in human populations and resource development in Alaska also contribute to the cumulative effects to natural resources. All of these items will affect populations of wildlife, habitat, ecological processes and interactions over the long-term.

#### **4.3.1.3 Conclusion**

Alternative 1 is anticipated to result in measureable changes in wildlife populations and habitat, relative to other factors. Localized effects in particular on individual animals, family groups, and packs are expected to be substantial. These changes would be viewed as high in intensity and long-term in duration. The potential impacts of Alternative 1 would be inconsistent with USFWS mandates (see introduction and legal directives sections for more explanation). Therefore, the USFWS determines that this alternative may have moderate to major impacts on wildlife (terrestrial mammals) and habitats. These methods and means currently account for a modest amount of the overall annual harvest on these predator species; however, if continued under Alternative 1 and if these methods and means are expanded through additional regulatory action to include larger areas and additional refuge lands, the cumulative impacts would likely be major. Alternative 1 would have negative impacts on predator populations because Alternative 1 would potentially reduce populations to a point where affected populations would not be able to maintain themselves and where the populations would not be conserved in their natural diversity. The increased effectiveness of take of predators is a concern due to the likelihood of negatively influencing population numbers without a reliable and cost effective method of population monitoring, as well as the likelihood for additional unforeseen consequences to the species, habitats, processes, and interactions that occur on refuges which would not be consistent with the conservation of natural or biological diversity, biological integrity, or environmental health.

## 4.3.2 Promulgate Regulations on Certain Methods and Means for Taking Predators on NWR in Alaska – Proposed Action Alternative (Alternative 2)

### 4.3.2.1 Direct and Indirect Effects

Alternative 2 would maintain historic statewide regulations prohibiting certain methods and means that increase the effectiveness for take of predator species during general hunting seasons on refuges in Alaska. This alternative would largely maintain baseline conditions that existed prior to the relatively recent liberalization of State general hunting and trapping regulations, which would be more consistent with the conservation of fish and wildlife populations and habitats in their natural diversity and maintenance of biological integrity, diversity, and environmental health on refuges in Alaska. Within the 16 Alaska refuge boundaries, predator and prey populations will be influenced by natural ecosystem structure and function, in a manner consistent with conserving natural and biological diversity, biological integrity, and environmental health.

The potential direct impacts to both brown and black bears are discussed below. Liberalizations to longstanding prohibitions on the methods and means described in this proposed rule have only occurred on some refuges in Alaska and for a very short time. For this reason, there are likely only a few places where the newly approved methods and means have had an impact on local black and brown bear populations. Therefore, it is unlikely that this proposed rule will significantly alter existing black and brown bear populations on NWRs in Alaska. Alternative 2 will allow black and brown bear populations to fluctuate in a more natural manner in response to food availability, climate, and habitat quality. It will also allow both species to fulfill their role as apex predators on the landscape and maintain intact ecological process. Alternative 2 will allow bear populations to be managed to provide opportunity for all users, including hunters. By allowing only sustainable, long-standing approved hunting methods, hunter opportunity may be maintained for longer periods. Hunter harvest would be maintained at a level that does not significantly alter naturally existing bear populations. Bear harvest opportunities may be reduced on some refuges by not allowing the take of bears with certain methods and means, but the added opportunities by maintaining healthy bear populations utilizing traditional harvest methods would compensate for any short term loss in opportunity utilizing prohibited methods and means.

Indirectly, bear populations on lands adjacent to refuges in Alaska may realize increased harvest of bears using these methods and means that would be prohibited as a result of this rule. This could lead to reduced populations on State of Alaska, Native, and private lands where more efficient methods and means are used. Refuges may also see decreased populations along the borders as the home range of some of the animals may overlap jurisdictional boundaries, making them more susceptible to harvest off refuge.

The direct impacts of the Alternative 2 on wolf populations would be low. Wolf harvest opportunity would be reduced on some refuges by not allowing harvest of wolves during the denning season when wolves and family groups are likely to be more susceptible to harvest. This would mostly affect seasons by eliminating hunting opportunities during the month of May in some GMUs on refuges where it is currently allowed. Recent harvest levels for wolves during a seven year period between the 2005-2006 season and 2012-2013 season range between 1063 and 1354 wolves harvested seasonally statewide (ADF&G 2013). Of the total number of wolves

harvested, those taken by ground shooting (the method that will be impacted by this Alternative) range from 328 to 447 wolves harvested in the areas of the State that contain refuges (all except Southeast Alaska) affected under this Alternative. Looking more specifically at wolves harvested during the month of May (numbers derived from fur sealing records for a ten year period from 2005-2014) shows that 103 wolves (average 10 wolves per season) were taken in statewide, excluding Southeast Alaska, and do not represent the portion on refuges that would be impacted by the rule change. Localized decreased wolf harvest under this Alternative may yield moderate impacts to those populations by reducing harvest intensity and allowing for long term natural variability and fluctuations in those specific local areas.

Under the Alternative 2, the direct impact on coyote populations would be low to moderate (depending on existing populations, access and hunting pressures) due to the considerable reduction in hunting seasons and harvest opportunities. Hunting and trapping harvest rates and population estimates for coyotes are undetermined. Therefore the predicted direct impact is reasonable assuming harvest pressure will be reduced commensurate with reduction of hunting season duration by over 25% in most areas. Hunting seasons will be reduced from year round in duration to August 10 – April 30 on all or part of all 16 refuges in Alaska. Coyote hunting opportunities in portions of Yukon Delta, Alaska Maritime and Togiak refuges that are in GMUs 2, 18 and 22 will not be affected by Alternative 2 and therefore, there would be no direct effect on coyote populations in those areas.

Prohibiting the take of predators by certain methods and means may allow natural population fluctuations dictated by intrinsic population growth (rates of pregnancy, calf survival, herd recruitment, etc.) and influenced by predation and other environmental factors (Darling 1937; Lack 1954; Caughley 1977; Clutton-Brock et al. 1982; Emlen 1984; Gotelli 2001; Danell et al. 2006). Under some conditions and in some locations, this may include either predator, prey, or both populations declining to a point that they are below the threshold of detection through current monitoring methods and techniques, or they may actually become locally extirpated, until such time that the site is recolonized by dispersing animals (Valkenburg et al. 2003). Habitat carrying capacity and predation would be the primary limiting factors for ungulates along with other environmental factors such as local weather events, disease, climate, and parasites. (Hassell 1976; Caughley 1979; Taylor 1984; McNab 1985; Dhondt 1988; Pulliam 1988; Crawley 1992; Estes et al. 2001; Gese and Knowlton 2001; Barbosa and Castellanos 2005; Terborgh and Estes 2010).

#### **4.3.2.2 Cumulative Effects**

Cumulative effects on wildlife, specifically terrestrial mammals and their habitats, would be low to moderate dependent on which refuges were being analyzed, and considering access and visitor/hunter use. If the USFWS promulgates a ruling to limit these certain method and means for the take of predators on refuges in Alaska, cumulative impacts to both predator and prey species and their habitats are anticipated to be negligible and populations of both animals would continue to fluctuate at a naturally occurring pace. At present, all but one of the proposed prohibited methods and means are currently allowed under State and Federal regulations on many refuges in Alaska; therefore, Alternative 2 would minimize the impacts, cumulative or otherwise, to the refuge resources if implemented.

#### 4.3.2.3 Conclusion

Alternative 2 would prohibit certain methods and means for the harvest of bears, wolves and coyotes on refuges in Alaska. These specific methods and means have the tendency (variably dependent on the individual refuge, and the access and specific regulations that currently exists on each refuge) to increase the harvest effectiveness, thereby increasing take of these predator species. Alternative 2 would help conserve predator populations in their natural diversity and thereby ensure that regulations for the non-subsistence take of wildlife on refuges are consistent with mandates to manage for natural and biological diversity, biological integrity and environmental health. These methods and means have only been allowed recently.

#### 4.4 Subsistence (ANILCA Section 810 Evaluation)

Section 810(a) of ANILCA states the following:

“In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands 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. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be affected until the head of such Federal agency”.

A finding that the proposed action may significantly restrict subsistence uses imposes additional requirements, including provisions for notices to the State of Alaska and appropriate regional and local subsistence committees, a hearing in the vicinity of the area involved, and the making of the following determinations, as required by Section 810(a)(3):

- Such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands;
- The proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition; and
- Reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions.

To determine if a significant restriction of subsistence uses and needs may result from any one of the alternatives discussed in the EA, including their cumulative effects, the following factors in particular are considered:

- Reductions in the abundance or availability of subsistence resources due to project impacts on population or habitats, (derived from analysis of impacts to the biological environment in Section 4.3);
- Reduction in the opportunity for Federally qualified subsistence users to harvest subsistence resources based on harvest regulations;

- Reductions in access to subsistence harvest areas (due to legal or physical barriers associated with the proposed project);
- Increases in competition for subsistence resources, resulting from the proposed project and;
- Reductions in subsistence mixed economy.

When analyzing the effects of the alternatives, impacts to subsistence uses focus on the non-commercial, customary and traditional hunting, fishing and trapping activities of rural residents within the proposed project area. Rural residents are residents of communities or areas determined to be rural by the FSB and exclude those communities or areas listed at 36 CFR 242.23 and 50 CFR 100.23.

#### **4.4.1 Effects Common to All Alternatives**

##### **4.4.1.1 Evaluation of the Availability of Other Lands**

As the proposed rule specifically addresses whether or not to allow specific current or future State hunting regulations on National Wildlife Refuges, there was no further evaluation regarding the availability of other lands for the proposed actions.

##### **4.4.1.2 .Reductions in Access to Subsistence Harvest Areas**

Section 811(a) of ANILCA states that the Secretary of the Interior “shall ensure rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on public lands.” The two alternatives address whether or not to allow specific regulations affecting the take of certain predator species, which does not affect access to Federal public lands.

#### **4.4.2 Alternative 1 – No Action Alternative**

##### **4.4.2.1 Direct and Indirect Effects**

##### **4.4.2.1.1 Reduction in Abundance or Availability of Subsistence Resources**

Alternative 1 would continue to allow the State’s general hunting and trapping regulations for several specific predator species (i.e., bears, wolves, and coyotes) to apply to all refuges in Alaska; however, not all of the identified methods and means or season dates are currently in general regulations (e.g., black bear trapping or snaring). Current and future harvest regulations promulgated by the Alaska BOG to target predator populations have the potential to reduce predator populations, especially with the effectiveness of the identified methods and means and potential impacts from harvesting wolves and coyotes during the denning season (see Wildlife and Habitat Section). State IM programs on adjacent lands would likely have greater impacts, at least in the short term, on predator populations. Reduction in the abundance and availability of these predator populations could affect subsistence uses by Federally qualified subsistence users on refuges in Alaska. However, if predator populations are reduced to a level where take restrictions are necessary to ensure the continued viability of the population or the continuation of subsistence uses, then Federal subsistence uses would be given a priority following Section 804 of ANILCA.

Decreased predator populations could result in increased ungulate prey populations (see Hegel et. al. 2010a), which could provide increased opportunity (in the short term) for Federally qualified subsistence users to harvest these species. The long-term effects on predators could result in predator populations returning to or exceeding pre-liberalization or IM efforts. However this outcome also depends largely on numerous factors such as the frequency and intensity of the predator management, other hunting related management actions, whether or not predation was a primary factor limiting these populations and/or other limiting factors that may be present such as disease, climatic factors, contaminants, the availability of suitable habitat, etc.

#### **4.4.2.2 Reduction in Regulatory Opportunity to Harvest**

Alternative 1 would not apply to or change Federal subsistence regulations, so there would be no reduced opportunity for Federally qualified subsistence users to harvest the predator species under the Federal Subsistence Management Program Regulations. Under Alternative 1, there would be no Federal action to restrict State regulation of predator harvest on refuge lands; thus, there would be continuity of regulations on and off refuge lands for Federally qualified subsistence users hunting under State regulations, including any instances where State registration permits or harvest tickets are required under Federal regulations.

#### **4.4.2.3 Increase in Competition for Subsistence Resources**

If localized ungulate populations increase as a result of predator reduction efforts, increased numbers of State resident or nonresident hunters could start hunting in localized areas. An influx of new hunters could lead to increased competition for Federally qualified subsistence users in some locations. However, if increased competition impacts ungulate populations or the continuation of subsistence uses of ungulate populations, then Federal subsistence uses would be accorded a priority under Section 804 of ANILCA, with the potential for closures to hunting under Sections 815(3) and 816 of ANILCA.

#### **4.4.2.4 Reductions in Subsistence Mixed Economy**

Under Alternative 1, the current subsistence mixed economy would be maintained with the future possibility of a reduction of predators providing fewer materials for traditional handicrafts/art work and the reduction of cash income from customary trade and from guiding/transporting activities on private/state/refuge lands and waters.

#### **4.4.2.5 Cumulative Impacts**

The Federal subsistence taking of wildlife regulations (36 CFR 242.26 and 50 CFR 100.26) contain approximately 30 public land closures to non-Federally qualified hunters in places affecting harvest of moose, caribou, muskox, and sheep in refuges where the FSB has determined restrictions are necessary for the conservation of healthy fish or wildlife populations, to allow the continuation of subsistence uses, or for reasons of public safety or administration. These restrictions will remain in effect until the FSB determines they are no longer necessary, following the FSB's *Policy on Closures to Hunting, Trapping and Fishing on Federal Public Lands and Waters in Alaska* (August 29, 2007) (Closure Policy). Combined with effects from implementing State general hunting regulations under Alternative 1, the Federal subsistence harvest of ungulates could increase and the subsistence take of bears, wolves and coyotes from hunting and trapping could decrease.

Cash income from customary trade and sales, and guiding/transporting would be maintained but could be impacted from the reduction of predators due to liberal seasons and harvest limits for non-subsistence hunters, and increased competition with other uses.

#### **4.4.2.6 Conclusion**

Alternative 1 would not result in a significant restriction on subsistence uses. The alternatives could result in some minor impacts on the opportunity for Federally-qualified subsistence users to harvest subsistence resources. In general, Federally-qualified subsistence users could experience increased short-term opportunity to harvest ungulate population, while there could be reduced opportunity to harvest some predator populations. However, Sections 804, 815 and 816 of ANILCA provides a subsistence priority whenever restrictions on take of fish and wildlife populations are necessary for the conservation and continued viability of such populations or to continue subsistence uses. The FSB could impose restrictions on Federal public lands, including refuges in Alaska, if necessary for the conservation of healthy ungulate or predator populations or to continue subsistence uses of those populations.

### **4.4.3. Alternative 2 - Action Alternative - Promulgate Regulations to Prohibit Several Particularly Efficient Methods and Means for Take of Predators on Refuges in Alaska**

#### **4.4.3.1 Direct and Indirect Impacts**

##### **4.4.3.2 Reduction in Abundance or Availability of Subsistence Resources**

If Alternative 2 was implemented, the non-subsistence harvest of coyotes would be prohibited from May 1 to August 9 on refuges in Alaska under the State's general harvest regulations, which could impact the abundance and availability of these subsistence resources. However, predators would continue to be harvested on refuges with other methods and means under State general harvest regulations, many of which allow for liberal harvest limits and seasons. Federal subsistence regulations also apply to refuges in Alaska and often allow for liberal predator harvest. Overall, the abundance and availability of prey and predator populations are not expected to change under this alternative. Rather, wildlife populations on refuges would be managed in their natural "mix" and in natural densities and levels of variation. The abundance and availability of predator and ungulate populations would vary depending on climate and/or other natural and human-caused factors that reduce wildlife populations (see wildlife section, Section 3.2).

##### **4.4.3.3 Reduction in Regulatory Opportunity to Harvest**

The prohibition of certain State regulations on Alaska National Wildlife Refuges would result in additional regulatory complexity, in addition to what is already a relatively complex system of mixed State and Federal management of wildlife harvest, and could lead to confusion for all users. All users harvesting the specified predator species under State regulations and law enforcement would need to be aware of refuge boundaries to avoid violations. In many instances, Federal subsistence regulations require the use of a State registration permit or harvest ticket, so prohibitions of certain regulations only on refuge lands could impact Federally qualified subsistence users due to differing boundaries between State and Federal.

##### **4.4.3.4 Increase in Competition for Subsistence Resources**

Prohibiting the specified general harvest regulations would not likely affect the composition of users (Federally qualified and non-Federally qualified subsistence users), so there would be no

anticipated changes to the level of competition for subsistence resources. However, if increased competition impacts ungulate or predator populations or the continuation of subsistence uses of such populations, then Federal subsistence uses would be accorded a priority under Section 804 of ANILCA, with the potential for closures to hunting under sections 815(3) and 816 of ANILCA.

#### **4.4.3.5 Reductions in Subsistence Mixed Economy**

The proposed prohibition of methods and means could impact the subsistence mixed economy by reducing cash income opportunity on refuges in Alaska. For example, it would eliminate guiding for brown bear baiting conducted under State regulations, but not all brown bear hunting. It could be an immediate impact on subsistence users involved with the commercial aspects of these proposed prohibitions. It could also have an indirect impact on those who receive subsistence harvests through sharing, assuming those involved with the commercial aspects are households that harvest more for subsistence use. With the recent adoption of these methods and means, little is known about the level of involvement of subsistence users with these prohibited methods and means.

#### **4.4.3.6 Cumulative Impacts**

The Federal subsistence take of wildlife regulations (36 CFR 242.26 and 50 CFR 100.26) contain approximately 30 closures in place affecting moose, caribou, muskox, and sheep in refuges where the Federal Subsistence Board has determined restrictions are required to implement the federal subsistence priority found in ANILCA Sections 804, 815(3) and 816. These restrictions are publicly reviewed every three years and remain in effect until the FSB determines they are no longer necessary, following the FSB's Closure Policy. The FSB can only close Federal public lands, including refuges, to the harvest of populations if necessary for the conservation of healthy populations of fish and wildlife, to continue subsistence uses of fish and wildlife, or for reasons of public safety or administration.

Alternative 2 would not apply to or change the harvest of wildlife under Federal subsistence regulations. Therefore, the opportunity to hunt or trap wolves and coyotes with prime pelts under Federal subsistence regulations would be maintained. By managing harvests for historic healthy predator populations in refuges in Alaska, subsistence opportunities to harvest ungulates are expected to be maintained at current levels. Predator control efforts adjacent to and outside of USFWS-managed areas could reduce predator populations inside refuges in Alaska, potentially allowing for temporary increases in prey species for subsistence harvest inside refuges. If it is necessary to restrict the taking of ungulates or predator populations on refuges in Alaska, the Federal subsistence priority would be implemented under provisions of ANILCA Sections 804, 815(3) and 816. If necessary, a refuge manager may use refuge authority to close the refuge or portions of it on an emergency, temporary, or permanent basis (50 CFR 36.16 & 36.42).

The prohibition of spring/summer pelts and brown bear baiting could have an impact on the mixed cash economy of communities within and adjacent to the refuges.

#### **4.4.3.7 Conclusion**

These proposed methods and means would not change or apply to Federal subsistence regulations. Proposed USFWS regulations to prohibit certain efficient methods and means for the take of predators would not affect the USFWS ability to maintain long-standing subsistence

harvest opportunities authorized since refuges were established and expanded in 1980 under ANILCA, and would not result in a significant restriction on subsistence uses. While prohibiting certain State harvest regulations on refuges could lead to increase regulatory complexity and confusion among users, Federally qualified subsistence users would not be significantly restricted by the action. Any inadvertent restrictions to Federally qualified subsistence users based on the proposed action could be addressed through subsequent exceptions in 50 CFR 36 or action by the FSB. It is unknown as to whether the prohibited methods and means would impact the mixed cash subsistence economy associated with Alaska refuges because little is known as to how much, if at all, they have been integrated into the cash economy of nearby villages.

## **4.5 Public Use**

### **4.5.1 Alternative 1 – No Action**

#### **4.5.1.1 Direct and Indirect Effects**

Proposed reductions in predator populations from liberalized hunting regulations could result in increased ungulate populations in the short-term, depending on habitat conditions, and potential short term increased opportunities for guided and unguided hunters to harvest moose, caribou, and other ungulates and increased viewing opportunities for the public. Under this alternative, people hunting under sport/general hunting and trapping regulations could take wolves or coyotes for a longer season (including the denning and pupping seasons) where authorized, thus having the potential to more efficiently reduce population numbers for these species. The harvest opportunity for taking brown bears would be increased for people who choose to take brown bears over bait under general hunting and trapping regulations because these animals could be attracted to and harvested over black bear bait stations. Alternative 1 also allows for an overall increase in harvest opportunity and potential for efficient take of brown and black bears through same-day airborne take at registered bait stations. An increase in bear bait stations may lead to a decrease in visitors due to the unpleasant aesthetic or safety concern associated with the bait stations. In addition, visitors to these areas could have reduced opportunities to view bears, wolves, and coyotes in their natural habitat if more of these animals are harvested and removed.

An increase in guided and unguided sport hunters may contribute to an increase in the regional economy (a direct effect) and benefit local businesses. A decrease in non-hunting visitors seeking to view bears, wolves, or coyotes may contribute to a decrease in the regional economy. However, these potential economic losses may be mitigated by an increase in visitors seeking to view ungulates. Therefore, there may be a direct effect on both the state-wide and local economy. It is difficult to accurately quantify the potential economic effects to regional economies and local businesses due to the unavailability of site-specific expenditure data by different user groups.

Though most non-hunting visitors go to Alaska refuges in summer, some travel to these areas in early fall, spring, and even during the winter season. Winter season visitors would not likely be affected by most of the current State general hunting and trapping regulations for the take of predators on refuges, except for the potential reduction of wolf, bear, and coyote sightings as a result of the extended harvest seasons and allowance of liberal take methods and means for predators, potential increases in harvest of these species, and the increased presence of ungulates that may result from IM actions. Opportunities to trap furbearers such as wolves and coyotes during traditional seasons when pelts are in prime condition could be reduced as a result of

liberalized harvest seasons under current State general hunting and trapping regulations which allow take of these species between mid-April and mid-August. An indirect effect could be limited opportunities to conduct research on or observe un-manipulated populations of predators and their relationships with other species and ecosystem function. However, the opportunity to study the effects of predator-prey relationships and to collect baseline population information on predators and prey might be enhanced because the wildlife management agencies would be obligated to collect baseline density information on predator and prey.

#### **4.5.1.2. Cumulative Effects**

Other effects on public use could result from actions on and immediately adjacent to refuges in Alaska. There are several guided commercial activities visitors use for wildland adventures, hunting, and sport fishing trips. Brown bears are also important in many areas for wildlife viewing. This can serve as an aesthetic or cultural value or as an economic value in areas where tourism can provide economic opportunity to communities.

Liberalized harvest methods and seasons on predators on and adjacent to refuges could reduce predators occurring on refuges in Alaska, resulting over the long-term reduced opportunities to view and study large predators. On the other hand, the reduction of large predators on refuges, could lead to a short-term increase in ungulate populations, resulting in a short term increased viewing opportunity for ungulates. Depending on habitat quality and carrying capacity, it is difficult to accurately determine how predator-prey populations will stabilize over time. The cumulative effects on refuges in Alaska are speculative, as adequate data are unavailable to accurately assess any changes to the status quo as a result of the implementation of Alternative 1. With little baseline data to compare, the resulting fluctuations in predator-prey relationships would be difficult to project, and negative effects to habitat quality as a result of potential increased ungulate populations could be irreversible, further complicating the determination of the effects on visitor use.

#### **4.5.1.3. Conclusion**

Alternative 1 could result in the enhancement of additional harvest opportunities for predators under State general hunting and trapping regulations, may improve viewing opportunities of ungulates on refuges over the short-term, and potentially provide additional opportunities for harvest of moose and caribou in areas where the liberalized harvest of predators is allowed. It could also result in alterations or elimination of visitor observations and research study opportunities of naturally functioning wildlife populations, including predators like bears, wolves, and coyotes. The long-term effects could be wide ranging from decreased predator harvest opportunity and/or increased prey populations in the short-term, which may lead to decreased habitat and resource availability leading to population crashes.

### **4.5.1.2. Alternative 2- Promulgate Regulations on Prohibition of Several Particularly Efficient Methods and Means for Take of Predators on Refuges in Alaska**

#### **4.5.1.2.1 Direct and Indirect Effects**

As a result of Alternative 2, there may be a direct effect to big game hunting on refuges by decreasing their ability to use certain methods and means if these methods and means were prohibited. Conversely, there may be a direct effect to wildlife watching activities. If populations are not manipulated, there may be an increase in opportunities to view wildlife, including bears, wolves, and coyotes. From 2009 to 2013, big game hunting on refuges in

Alaska averaged about 40,000 days annually and represented 2 percent of wildlife-related recreation on refuges. Big game hunting on refuges in Alaska represented only 4 percent of all statewide big game hunting days (1.2 million days) for the State of Alaska. Due to the historical ban on these proposed prohibited methods and means for take of predators, it is estimated that these hunting methods (take of brown bears over bait, take of wolves and coyotes during the denning season, and same day airborne take of bears) represent a small fraction of all big game hunting on refuges. As a result, big game hunting on refuges would change minimally. This change in opportunity would most likely be offset by other sites (located outside of refuges) gaining participants. Therefore, there would be a substitute site for these hunting methods, and participation rates would not necessarily change.

This alternative would maintain the majority of State general hunting regulations and all other allowable public uses on refuges in Alaska. The harvest of bears, wolves, and coyotes under State general hunting and trapping regulations would likely decrease in the short term until equilibrium is reached or populations stabilize to the levels that were existent before BOG regulations to liberalize predator harvest seasons and methods were adopted. Natural populations and diversity of wildlife species, as well as natural ecosystem functioning would be more likely to continue for the foreseeable future, enabling public observation and scientific research of non-manipulated ecosystems with a natural distribution and abundance of predators and prey.

Another direct effect would be expenditures by hunters' on both the local as well as the State-wide economy. Hunters contribute income to the regional economy that benefits local businesses. Due to the unavailability of site-specific expenditure data, the Alaska estimate from the 2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation was used to identify expenditures for food and lodging, transportation, and other incidental expenses. Using the average trip-related expenditures for big game hunting (\$139 per day) yields approximately \$5.9 million annually in big game hunting-related expenditures on refuges in Alaska. Since only a small fraction of big game hunters would choose not to hunt on refuges under the proposed rule, the impact would be minimal. The net loss to the local communities would be no more than \$5.9 million annually, and most likely considerably less because few hunters use the prohibited methods and those hunters that do, would likely choose a substitute site.

Small businesses within the retail trade industry (such as hotels, gas stations, taxidermy shops, etc.) may be impacted from some decreased refuge visitation. A large percentage of these retail trade establishments in local communities around refuges qualify as small businesses. It is expected that the incremental recreational changes will be scattered, and so it is not expected that the rule would have a significant economic effect on a substantial number of small entities in Alaska. With the small change in overall spending anticipated from the proposed rule, it is unlikely that a substantial number of small entities would have more than a small impact from the spending change near the affected refuges.

#### **4.5.1.2.2. Cumulative Effects**

As a result of the implementation of Alternative 2, it is expected that the cumulative effects on refuges in Alaska would be in line with the status quo over the last several decades where populations of predators and prey are allowed to fluctuate naturally with minimal human interference and current use patterns would be minimally altered. The potential for observation

of a natural, relatively intact ecosystem may encourage increased public observation and scientific research, thus contributing to an improved knowledge base of the ecosystem.

#### **4.5.1.2.2. Conclusion**

Implementation of Alternative 2 (prohibition of particularly efficient methods and means for predator harvest under State regulations on refuge in Alaska) would be consistent with USFWS mandates as outlined in the purpose and need section. People harvesting wildlife under sport/general regulations will in some cases have smaller populations of prey species to harvest in the short-term, which could adversely impact hunter success and effort. Other recreational users would enjoy natural environments and ecosystems and the opportunities to observe biologically diverse refuge lands and waters where species and habitats are conserved in their natural diversity and biological integrity, diversity, and environmental health is maintained.

### **4.6 Wilderness**

#### **4.6.1 Alternative 1 – No Action Alternative**

##### **4.6.1.1 Direct and Indirect Effects**

Alternative 1 is not consistent with the Wilderness Act. Predator harvest liberalizations under Alternative 1 would have a direct effect on the natural quality of the wilderness areas from the reduction in populations of predators and the associated potential increase in prey species in addition to altering natural wildlife behavior and ecosystem processes.

The untrammeled quality of wilderness is influenced by any activity or action that intentionally controls or influences the components or processes of ecological systems inside wilderness. Alternative 1 could have long-term negative direct impacts to the untrammeled quality of wilderness character because the alternative involves wide-scale control and manipulation of wildlife populations and behaviors.

The solitude or primitive and unconfined type of recreation provided in wilderness areas affords visitors the opportunity to experience solitude and self-reliance, and is influenced by settings that affect these opportunities. This wilderness quality experience would be degraded and would be a direct effect under Alternative 1 by potentially increasing the likelihood of visitor encounters, increasing signs of modern civilization inside wilderness, and decreasing the opportunity to experience a naturally regulated ecosystem. Additional impacts related to visitor experience are covered in the Public Use section.

Alternative 1 may result in a higher level of use of Alaska refuges than currently exists. Increased motorized access could impact the untrammeled quality and opportunities for solitude of wilderness areas in Alaska Refuges.

Alternative 1 could have an indirect effect on scientific and educational values of these large natural areas by creating unnatural wildlife abundances, distributions, and behaviors.

##### **4.6.1.2. Cumulative Effects**

Other effects on wilderness character could result from the following:

- **Natural Quality:** Climate change and harvest of wildlife have the potential to influence natural ecosystems and processes.
- **Untrammeled:** There are extremely few examples of intentional manipulation of wilderness resources. However, increased use of refuge lands could have an effect on wilderness.
- **Opportunities for Solitude:** Other visitor use that occurs in the refuges affects opportunities for solitude, though existing use levels in refuges tends to be very low.
- **Undeveloped:** Ongoing motorized access by the public and for administrative activities, including maintenance of scattered communications and weather station sites could negatively impact the undeveloped quality of wilderness areas. The USFWS does not anticipate additional developments in wilderness.

These cumulative effects are expected to negatively impact wilderness character. The effects would likely result in a slight increase in the degradation of wilderness character. Alternative 1 contributes to degradation of wilderness character and does not align with mandates to manage wilderness areas.

#### **4.6.1.3. Conclusion**

Alternative 1 is expected to result in long-term negative impacts to wilderness character. It could degrade the natural and untrammeled quality, opportunities for solitude, and the undeveloped quality throughout refuges in Alaska.

The primitive and unconfined type of recreation may be degraded under Alternative 1 by increasing the likelihood of visitor encounters, adding signs of modern civilization inside wilderness (i.e. bear baiting stations), and creating safety concerns (food-habituated bears, for example). Additional impacts related to visitor experience are covered in the Impacts to Public Use section. Alternative 1 may result in a higher level of use and motorized access (snowmachines, all-terrain vehicles, boats, airplanes, etc.) to refuges than currently exists. Increased motorized access could impact the untrammeled quality and opportunities for solitude of wilderness areas in refuges in Alaska.

#### **4.6.2 Alternative 2 -Promulgate Regulations on Prohibition of Several Particularly Efficient Methods and Means for Take of Predators on Refuges in Alaska**

##### **4.6.2.1. Direct and Indirect Effects**

Alternative 2 would preserve the natural quality of wilderness areas in Alaska by not adopting sport/general hunting and trapping regulations that have the potential to greatly alter predator or prey populations, dynamics, and natural processes. This alternative is consistent with our legal mandates for administering refuges in Alaska under ANILCA, the Administration Act, and the Wilderness Act, as well as with several applicable agency policies (USFWS Manuals 601 FW 3, 610 FW 2, and 605 FW 2).

The untrammeled quality is influenced by any activity or action that intentionally controls or influences the components or processes of ecological systems inside wilderness. This alternative would preserve the untrammeled quality by prohibiting activities that may alter or manipulate

natural ecosystems or processes to increase or decrease native wildlife populations for human harvest.

The solitude quality is primarily about the opportunity for people to experience solitude and self-reliance, and is influenced by settings that affect these opportunities. This quality would not be changed or affected by the USFWS proposed regulations. Additional impacts related to visitor experience are covered in the Public Use section.

The untrammeled quality would be maintained because no increases in ANILCA-authorized motorized access by all recreational users is expected. Therefore, the current untrammeled quality would be preserved.

The other features of wilderness value would likely not affect other features of value such as research and observations on naturally functioning ecosystems.

#### **4.6.2.1. Cumulative Effects**

The implementation of Alternative 2 would reflect baseline conditions that existed prior to the pre-liberalization of State regulations in Wilderness areas, with regard to conservation of natural and biological diversity, integrity and environmental health.

#### **4.6.2.1. Conclusion**

As a result of the implementation of Alternative 2, the natural, untrammeled, and undeveloped qualities, as well as opportunities for solitude, would be allowed to continue into the foreseeable future throughout Alaska refuges.

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## 5.0 Consultation and Coordination

### 5.1 Agency Consultation and Coordination

The USFWS is the lead agency in the development of this EA. Once the proposed rule and draft EA are published, there will be a 90 day public comment period on both the proposed rule and the EA. After considering the comments received, the USFWS will reach a final decision and will then publish a final rule. The USFWS may also publish a Finding of No Significant Impact (FONSI) for the EA. This FONSI would take into account any new information and public comment. If the USFWS concludes with a FONSI, then the deciding official would write a decision document that would select an alternative to implement, make additional agency findings, and identify any stipulations.

### 5.2 List of Preparers

**Table 3 List of Preparers**

<b>Name</b>	<b>Position</b>	<b>Location</b>
Stephanie Brady	Fish and Wildlife Biologist, Division of Realty and Planning	USFWS Alaska Regional Office, Anchorage, AK
Heather Abbey Tonneson	Regional Refuge Ecologist	USFWS Alaska Regional Office, Anchorage, AK
John Martin	Refuge Ecologist and Landscape Planner, Division of Realty and Planning	USFWS Alaska Regional Office, Anchorage, AK
Nathan Hawkaluk	Deputy Refuge Manager, Yukon Flats Refuge	Fairbanks, AK
Tessa Johrendt	Refuge Wildlife Biologist	USFWS Alaska Regional Office, Anchorage, AK
Todd Eskelin	Fish and Wildlife Biologist (Subsistence), Kenai Wildlife Refuge	Soldotna, AK
Vince Mathews	Subsistence Coordinator, Yukon Flats, Kanuti, and Arctic Refuges	Fairbanks, AK

## 6.0 Glossary

*Abiotic* is non-living chemical and physical features of the environment (e.g. soil, air, water, temperature, etc.).

*Anthropogenic* is human impact on the environment.

*Apex predator* is a predator at the top of the food chain that is not preyed upon by any other animals.

*Bait* means any material excluding a scent lure that is placed to attract an animal by its sense of smell or taste; however, those parts of legally taken animals that are not required to be salvaged and which are left at the kill site are not considered bait.

*Big game* means black bear, brown bear, bison, caribou, Sitka black-tailed deer, elk, mountain goat, moose, muskox, Dall sheep, wolf, and wolverine.

*Biological diversity* is the variety of life and its processes, including the variety of living organisms, the genetic differences among them, and communities and ecosystems in which they occur.

*Biological integrity* is biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.

*Biotic* is the living or formally living components of the environment, such as plants and animals.

*Carnivore* is a flesh eating mammal.

*Commensalism* is an association between two organisms in which one benefits and the other derives neither benefit nor harm.

*Competition* is an interdependent relationship between or among living things for resources, such as food, space, shelter, mates, or ecological status.

*Cub bear* means a brown (grizzly) bear in its first or second year of life, or a black bear (including the cinnamon and blue phases) in its first year of life.

*Environmental health* is composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

*Furbearer* means a beaver, coyote, arctic fox, red fox, lynx, marten, mink, least weasel, short-tailed weasel, muskrat, land otter, red squirrel, flying squirrel, ground squirrel, Alaskan marmot,

hoary marmot, woodchuck, wolf, or wolverine. Note: the State's definition includes black bear, the USFWS definition does not.

*Intensive Management* refers to the State of Alaska's law and related wildlife management regime that requires the Alaska Board of Game to designate populations of ungulates for which human consumptive use is the highest priority use, set population and harvest objectives for those populations, and implement actions to restore the abundance or productivity of identified big game prey populations as necessary to achieve human consumptive use goals.

*Limiting factor* is an environmental factor that tends to limit population size.

*Mutualism* is an interdependent relationship between different species in which both individuals benefit from the association.

*Natural diversity* refers to the USFWS's mandate under ANILCA to protect and manage all fish and wildlife populations within a particular wildlife refuge system unit in the natural 'mix,' not to emphasize management activities favoring one species to the detriment of another.

*Parasitism* is a non-mutual interdependent relationship where one organism benefits at the expense of another.

*Predation* interdependent relationship where one organism captures and feeds on another.

*Predator* is an animal that naturally preys on other animals, generally refers to brown bear, black bear, wolf, and coyote in the context of this document.

*Predator control* is the intention to reduce the population of predators for the benefit of prey species.

*Predator control areas* are game management units or areas within those units where regulations that require targeted reductions of wolf, black bear, brown bear, or a combination of these are implemented under the State's intensive management program.

*Predator-prey dynamics* are interactions between predators and prey that evolve over time and influence populations, community structure, ecological roles of species, and other biotic and abiotic processes.

*Prey* is an animal that is hunted and killed by another for food, often refers to ungulate species (moose, caribou, sheep, etc.) within this document, although is not limited to only ungulates.

*Sport or general hunting and trapping* is the harvest of wildlife under State regulations for general or sport hunting and trapping which is open to Alaska residents and non-residents.

*Subsistence* refers to harvest of fish and wildlife under Federal subsistence regulations (36 CFR 242 and 50 CFR 100) in accordance with Title VIII of ANILCA.

*Trapping* means taking furbearers under a trapping license.

*Trophic cascade* is an ecological phenomenon triggered by the addition or removal of top predators and involving reciprocal changes in the relative populations of predator and prey through a food chain, which often results in dramatic changes in ecosystem structure and nutrient cycling.

*Ungulate* is a hoofed mammal.

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DRAFT

## Appendix A

Section 302 of ANILCA created new units of the National Wildlife Refuge system in Alaska, listed below.

**Alaska Peninsula National Wildlife Refuge:** consists of approximately three million five hundred thousand acres of public land. Purposes:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, brown bears, the Alaska Peninsula caribou herd, moose, sea otters and other marine mammals, shorebirds and other migratory birds, raptors, including bald eagles and peregrine falcons, and salmonoids and other fish;
- (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 the purposes set forth in subparagraphs
- (iv) (i) and (ii) above, the opportunity for continued subsistence uses by local residents; and (iv) 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.

**Becharof National Wildlife Refuge:** consists of approximately one million two hundred thousand acres of public land. Purposes:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, brown bears, salmon, migratory birds, the Alaskan Peninsula caribou herd and marine birds and 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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Innoko National Wildlife Refuge:** consists of approximately three million eight hundred and fifty thousand acres of public land. Purposes:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, waterfowl, peregrine falcons, other migratory birds, black bear, moose, furbearers, and other mammals and salmon;
- (ii) to fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats;
- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Kanuti National Wildlife Refuge:** consists of approximately one million four hundred and thirty thousand acres of public land. Purposes:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, white-fronted geese and other waterfowl and migratory birds, moose, caribou (including participation in coordinated ecological studies and management of the Western Arctic caribou herd), and furbearers;
- (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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Koyukuk National Wildlife Refuge:** consists of approximately three million five hundred and fifty thousand acres of public land. Purposes:

- (i) to conserve the fish and wildlife populations and habitats in their natural diversity including, but not limited to, waterfowl and other migratory birds, moose, caribou (including participation in coordinated ecological studies and management of the Western Arctic caribou herd), furbearers, and salmon;
- (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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Nowitna National Wildlife Refuge:** consists of approximately one million five hundred and sixty thousand acres of public land. Purposes:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, trumpeter swans, white-fronted geese, canvasbacks and other waterfowl and migratory birds, moose, caribou, martens, wolverines and other furbearers, salmon, sheefish, and northern pike;
- (ii) to fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats;
- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Selawik National Wildlife Refuge:** consists of approximately two million one hundred and fifty thousand acres of public land. Purposes:

- (i) to conserve the fish and wildlife populations and habitats in their natural diversity including, but not limited to, the Western Arctic caribou herd (including participation in coordinated ecological studies and management of these caribou), waterfowl, shorebirds and other migratory birds, and salmon and shellfish;
- (ii) to fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats;
- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

In addition, the Secretary shall administer the refuge in such a manner as will permit reindeer grazing uses, including the construction and maintenance of necessary facilities and equipment within the areas, which on January 1, 1976, were subject to reindeer grazing permits.

**Tetlin National Wildlife Refuge:** consists of approximately seven hundred thousand acres of public land. Purposes:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, waterfowl, raptors and other migratory birds, furbearers, moose, caribou (including participation in coordinated ecological studies and management of the Chisana caribou herd), salmon and Dolly Varden;
- (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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents;
- (iv) 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; and
- (v) to provide, in a manner consistent with subparagraphs (i) and (ii), opportunities for interpretation and environmental education, particularly in conjunction with any adjacent State visitor facilities.

**Yukon Flats National Wildlife Refuge:** consists of approximately eight million six hundred and thirty thousand acres of public land. Purposes:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, canvasbacks and other migratory birds, Dall sheep, bears, moose, wolves, wolverines and other furbearers, caribou (including participation in coordinated ecological studies and management of the Porcupine and Fortymile caribou herds) and salmon;
- (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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

Section 303 of ANILCA created additions to existing National Wildlife Refuges in Alaska, by establishing or re-designating units.

**Alaska Maritime National Wildlife Refuges:** includes eleven existing refuges, including all lands (including submerged lands), waters and interests therein which were a part of such refuges and are hereby re-designated as subunits of the Alaska Maritime National Wildlife Refuge; approximately four hundred and sixty thousand acres of additional public lands on islands, islets,

rocks, reefs, spires and designated capes and headlands in the coastal areas and adjacent seas of Alaska, and an undetermined quantity of submerged lands, if any, retained in Federal ownership at the time of statehood around Kodiak and Afognak Islands. The Sub Units are as follows:

- (i) **Chukchi Sea Unit**—including Cape Lisburne, Cape Thompson, the existing Chamisso National Wildlife Refuge and all other public lands on islands, islets, rocks, reefs, spires, and designated capes and headlands in the Chukchi Sea, but excluding such other offshore public lands within the Bering Land Bridge National Preserve. That portion of the public lands on Cape Lisburne shall be named and appropriately identified as the “Ann Stevens-Cape Lisburne” subunit of the Chukchi Sea Unit;
- (ii) **Bering Sea Unit**—including the existing Bering Sea and Pribilof (Walrus and Otter Islands) National Wildlife Refuges, Hagemester Island, Fairway Rock, Sledge Island, Bluff Unit, Besboro Island, Penuk Islands, Egg Island, King Island, and all other public lands on islands, islets, rocks, reefs, spires and designated capes and headlands in the Bering Sea;
- (iii) **Aleutian Islands Unit**—including the existing Aleutian Islands and Bogoslof National Wildlife Refuges, and all other public lands in the Aleutian Islands;
- (iv) **Alaska Peninsula Unit**—including the existing Simeonof and Semidi National Wildlife Refuges, the Shumagin Islands and delineated submerged lands, Sutwik Island, the islands and headlands of Puale Bay, and all other public lands on islands, islets, rocks, reefs, spires and designated capes and headlands south of the Alaska Peninsula from Katmai National Park to False Pass including such offshore lands incorporated in this unit under section 1427; and
- (v) **Gulf of Alaska Unit**—including the existing Forrester Island, Hazy Islands, Saint Lazaria and Tuxedni National Wildlife Refuges, the Barren Islands, Latax Rocks, Harbor Island, Pye and Chiswell Islands, Ragged, Natoa, Chat, Chevel, Granite and Middleton Islands, the Trinity Islands, all named and unnamed islands, islets, rocks, reefs, spires, and whatever submerged lands, if any, were retained in Federal ownership at the time of statehood surrounding Kodiak and Afognak Islands and all other such public lands on islands, islets, rocks, reefs, spires and designated capes and headlands within the Gulf of Alaska, but excluding such lands within existing units of the National Park System, Nuka Island and lands within the National Forest System except as provided in section 1427 of ANILCA.

*Purposes:*

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to 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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents;
- (iv) to provide, in a manner consistent with subparagraphs (i) and (ii), a program of national and international scientific research on marine resources; and
- (v) 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.

**Arctic National Wildlife Refuge:** shall consist of the existing Arctic National Wildlife Range including lands, waters, interests, and whatever submerged lands, if any, that were retained in Federal ownership at the time of statehood and an addition of approximately nine million one hundred and sixty thousand acres of public lands.

*Purposes:*

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, the Porcupine caribou herd (including participation in coordinated ecological studies and management of this herd and the Western Arctic caribou herd), polar bears, grizzly bears, muskox, Dall sheep, wolves, wolverines, snow geese, peregrine falcons and other migratory birds and Arctic char and grayling;
- (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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Izembek National Wildlife Refuge:** shall consist of the existing Izembek National Wildlife Range including the lands, waters and interests of that unit which shall be re-designated as the Izembek National Wildlife Refuge.

*Purposes:*

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, waterfowl, shorebirds and other migratory birds, brown bears and salmonoids;

- (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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Kenai National Wildlife Refuge:** shall consist of the existing Kenai National Moose Range, including lands, waters, interests, and whatever submerged lands, if any, were retained in Federal ownership at the time of statehood, which shall be re-designated as the Kenai National Wildlife Refuge, and an addition of approximately two hundred and forty thousand acres of public land.

*Purposes:*

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, moose, bears, mountain goats, Dall sheep, wolves and other furbearers, salmonoids and other fish, waterfowl and other migratory and non-migratory birds;
- (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
- (iii) 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;
- (iv) to provide in a manner consistent with subparagraphs (I) and (ii), opportunities for scientific research, interpretation, environmental education, and land management training; and
- (v) to provide, in a manner compatible with these purposes, opportunities for fish and wildlife-oriented recreation.

**Kodiak National Wildlife Refuge:** shall consist of the existing Kodiak National Wildlife Refuge, including lands, waters, interests, and whatever submerged lands, if any, were retained in Federal ownership at the time of statehood, which is re-designated as the Kodiak Island Unit of the Kodiak National Wildlife Refuge, and the addition of all public lands on Afognak and Ban Islands of approximately fifty thousand acres.

*Purposes:*

- (i) to conserve fish and wildlife populations habitats in their natural diversity including, but not limited to, Kodiak brown bears, salmonoids, sea otters, sea lions and other marine mammals and migratory birds;

- (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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

**Togiak National Wildlife Refuge:** shall consist of the existing Cape Newenham National Wildlife Refuge, including lands, waters, and interests therein, which shall be re-designated as a unit of the Togiak National Wildlife Refuge, and an addition of approximately three million eight hundred and forty thousand acres of public land.

*Purposes:*

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, salmonoids, marine birds and mammals, migratory birds and large mammals (including their restoration to historic levels);
- (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 the purposes set forth in subparagraphs (I) and (ii), the opportunity for continued subsistence uses by local residents, and
- (iv) 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.

**Yukon Delta National Wildlife Refuge:** shall consist of the existing Clarence Rhode National Wildlife Range, Hazen Bay National Wildlife Refuge, and Nunivak National Wildlife Refuge, including lands, waters, interests, and whatever submerged lands, if any, were retained in Federal ownership at the time of statehood, which shall be re-designated as units of the Yukon Delta National Wildlife Refuge and the addition of approximately thirteen million four hundred thousand acres of public land.

*Purposes:*

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, shorebirds, seabirds, whistling swans, emperor,

white-fronted and Canada geese, black brant and other migratory birds, salmon, muskox, and marine 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 the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) 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.

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## Appendix B

Tribal Governments, Regional Corporations and Village Corporations that were contacted.

### Tribal Government

Agdaagux Tribe of King Cove

Akiachak Native Community (IRA)

Akiak Native Community (IRA)

Alatna Village

Aleut Community of St. George

Aleut Community of St. Paul Island

Algaaciq Native Village

Allakaket Village

Anvik Village

Arctic Village Council

Asa'carsarmiut Tribe

Beaver Village

Birch Creek Tribal Council

Chalkyitsik Village

Chevak Native Village

Chignik Bay Tribal Council

Chignik Lake Village Council

Circle Native Community (IRA)

Curyung Tribal Council

Egegik Village

Ekwok Village

Emmonak Village

Evansville Tribal Council

Galena Village

Holy Cross Villiage

Hughes Village

Huslia Village

Igiugig Village

Iqurmiut Traditional Council

Ivanoff Bay Village Council

Kaguyak Village

Kasigluk Traditional Elders Council

Kenaitze Indian Tribe (IRA)

Kiana Traditional Council

King Salmon Tribe

Kokhanok Village

Koyukuk Native Village

Levelock Village

Mcgrath Native Village

Mentasta Traditional Council

Naknek Native Village

Native Village of Akhiok

Native Village of Aleknagik

Native Village of Ambler

Native Village of Belkofski  
Native Village of Buckland  
Native Village of Chignik Lagoon  
Native Village of Chuathbaluk  
Native Village of Deering (IRA)  
Native Village of Eagle (IRA)  
Native Village of Ekuk  
Native Village of False Pass  
Native Village of Fort Yukon (IRA)  
Native Village of Goodnews Bay  
Native Village of Hamilton  
Native Village of Hooper Bay  
Native Village of Kaktovik  
Native Village of Kanatak (IRA)  
Native Village of Karluk (IRA)  
Native Village of Kipnuk  
Native Village of Kivalina (IRA)  
Native Village of Kobuk  
Native Village of Kotzebue (IRA)  
Native Village of Kwigillingok  
Native Village of Kwinhagak (IRA)  
Native Village of Larsen Bay  
Native Village of Marshall  
Native Village of Mekoryuk (IRA)  
Native Village of Nanwalek  
Native Village of Napakiak (IRA)  
Native Village of Napaskiak  
Native Village of Nightmute  
Native Village of Noatak (IRA)  
Native Village of Bill Moore's Slough  
Native Village of Nunam Iqua  
Native Village of Nunapitchuk (IRA)  
Native Village of Ouzinkie  
Native Village of Paimiut  
Native Village of Pertyville  
Native Village of Pilot Point  
Native Village of Pitka's Point  
Native Village of Point Hope (IRA)  
Native Village of Port Graham  
Native Village of Port Heiden  
Native Village of Port Lions  
Native Village of Ruby  
Native Village of Scammon Bay  
Native Village of Selawik  
Native Village of Shungnak (IRA)  
Native Village of Stevens (IRA)  
Native Village of Tanacross  
Native Village of Tanana (IRA)  
Native Village of Tetlin (IRA)  
Native Village of Tununak  
Native Village of Tyonek (IRA)  
Native Village of Unga  
Nelson Lagoon  
New Koliganek Village Council  
New Stuyahok Village  
Newhalen Village  
Newtok Village  
Nikolai Village

Ninilchik Village  
Nondalton Village  
Noorvik Native Community (IRA)  
Northway Village  
Nulato Village  
Nunakauyarmuit Tribe  
Organized Village of Grayling (IRA)  
Organized Village of Kwethluk  
Orutsarmuit Native Village  
Oscarville Tribal Village  
Pauloff Harbor Village  
Pedro Bay Village  
Pilot Station Traditional Village  
Platinum Traditional Village  
Portage Creek Village  
Qawalangin Tribe of Unalaska  
Seldovia Village Tribe  
Shageluk Native Village (IRA)  
South Naknek Village Council  
Sun'aq Tribe of Kodiak  
Takotna Village  
Tangirnaq Native Village  
Traditional Village of Togiak  
Tuluksak Native Community (IRA)  
Tuntutuliak Traditional Council  
Twin Hills Village  
Ugashik Village  
Umkumiut Native Village  
Village of Alakanuk  
Village of Alakanuk  
Village of Aniak  
Village of Atmautluak  
Village of Chefornak  
Village of Clarks Point  
Village of Dot Lake  
Village of Iliamna  
Village of Kalskag  
Village of Kaltag  
Village of Kotlik  
Village of Lower Kalskag  
Village of Ohogamuit  
Village of Old Harbor  
Village of Salamatoff  
Village of Venetie  
Yupit of Andreakski

## Regional Corporations

Ahtna, Incorporated  
The Aleut Corporation  
Arctic Slope Regional Corporation  
Bering Straits Native Corporation  
Bristol Bay Native Corporation  
Calista Corporation  
Chugach Corporation  
Cook Inlet Region, Incorporated  
Doyon, Limited  
Koniag, Incorporated  
NANA Regional Corporation  
Sealaska Corporation

## Native Non-Profits

Kawerak, Inc.  
Maniilaq Association  
Association of Village Council Presidents  
Tanana Chiefs' Conference  
Tlingit-Haida Central Council  
Copper River Native Association  
North Slope Borough Division of Wildlife Management

Cook Inlet Tribal Council  
Bristol Bay Native Association  
Aleutian Pribilof Islands Association, Inc.  
Chugach Regional Resources Commission  
Kodiak Area Native Association  
Council of Athabascan Tribal Governments

## Village Corporations

Afognak Native Corporation

Akhiok-Kaguyak, Incorporated

Akiachak, Limited

Akutan Corporation

Alakanuk Native Corporation

Alaska Peninsula Corporation

Aleknagik Natives Limited

Askinuk Corporation

Atmautluak Limited

Atxam Corporation

Ayakulik, Incorporated

Azachorok Incorporated

Bay View Incorporated

Beaver Kwit'chin

Belkofski Corporation

Bethel Native Corporation

Chalkyitsik Native Corporation

Chefarnmute Incorporated

Chevak Company Corporation

Chignik Lagoon Native Corporation

Chignik River Limited

Chinuruk, Incorporated

Choggiung, Limited

Choggiung, Limited

Danzhit Hanlaii Corporation

Deloy Ges Incorporated

Deloycheet, Incorporated

Dineega Corporation

Dinyea Corporation

Ekwok Natives Limited

Emmonak Corporation

Evansville, Incorporated

Far West, Incorporated

Gana-A' Yoo, Limited

Gwitchyaa Zhee Corporation

Hee-Yea-Lingde Corporation

Igiugig Native Corporation

Iliamna Natives Limited

Iqfijouaq Company, Incorporated

Isanotski Corporation

Kaktovik Inupiat Corporation

Kasigluk Incorporated

Kikiktagruk Inupiat Corporation

King Cove Corporation

Kokarmuit Corporation

Koliganek Natives Limited

Koniag, Inc. (Kodiak Office)

Kotlik Yupik Corporation

K'oyitl'ots'ina, Limited

Kugaktlik Limited

Kuitsarak, Incorporated

Kwethluk Incorporated

Kwik Incorporated

Leisnoi, Incorporated

Levelock Natives Limited

Litnik, Incorporated

Manokotak Natives Limited

Maserculiq Incorporated

MTNT Limited

Napakiak Corporation

Napaskiak, Incorporated

Nelson Lagoon Corporation

Nerkilikmute Native Corporation

Newtok Corporation

Nima Corporation

Ninilchik Native Association, Incorporated

Northway Natives, Incorporated

Nunakauiak Yupik Corporation

Nunapiglluraq Corporation

Nunapitchuk, Limited

Ohog Incorporated

Old Harbor Native Corporation

Ouzinkie Native Corporation

Paimiut Corporation

Paug-Vik Inc.

Paug-Vik Incorporated, Limited

Pedro Bay Native Corporation

Pilot Point Native Corporation

Pilot Station Incorporated

Pitkas Point Native Corporation

Point Possession, Incorporated

Port Graham Corporation

Qanirtuuq, Incorporated

Qemirtalek Coast Corporation

Qinarmiut Corporation

Russian Mission Native Corporation

Saguyak, Incorporated

Salamatof Native Assoc., Inc.

Sanak Corporation

Sea Lion Corporation

Seldovia Native Association, Inc.

Shumagin Corporation

Shuyak, Incorporated

Stuyahok Limited

Swan Lake Corporation

Tanacross, Incorporated

The Kuskokwim Corporation

The Kuskokwim Corporation

Tiheet' Aii, Incorporated

Togiak Natives Corporation

Tozitna, Limited

Tulkisarmute, Incorporated

Tununrmiut Rinit Corporation

Twin Hills Native Corporation

Tyonek Native Corporation

Unga Corporation

Uyak, Incorporated

Zho-Tse, Incorporated