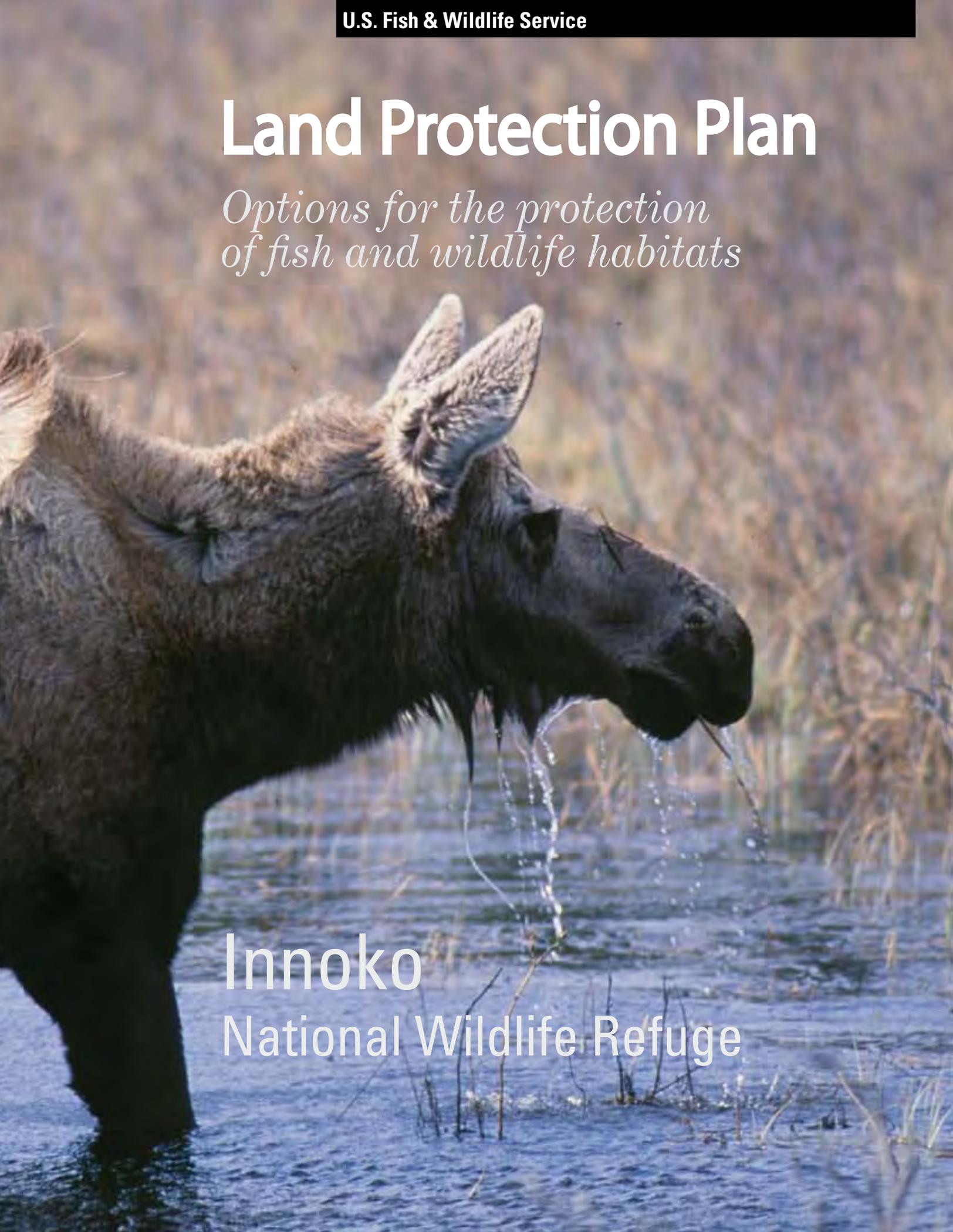


Land Protection Plan

*Options for the protection
of fish and wildlife habitats*

A close-up photograph of a moose standing in a shallow stream. The moose is dark brown with thick fur and large, upright ears. It is drinking water, with a stream of water flowing from its mouth. The background is a blurred natural setting with tall grasses and water.

Innoko
National Wildlife Refuge

Executive Summary

What is the Innoko Land Protection Plan? Private landowners own or have claims to nearly 240,000 acres of land within the Innoko National Wildlife Refuge. The Land Protection Plan (LPP) identifies which privately-owned lands contain the highest quality fish and wildlife habitats. It also lists options, ranging from informal cooperative agreements, to land exchanges, to selling lands or easements, that some landowners may wish to pursue. The LPP serves primarily to foster communication between the refuge and interested landowners and to help us identify priority areas with high resource value. It provides a framework for working with interested landowners to protect key resources.

Why do we prepare LPPs? U.S. Fish and Wildlife Service policy requires that we prepare an LPP for each refuge before we can obtain Land and Water Conservation Funds. The LWCF is the primary source of funding for buying easements or inholdings in Alaska refuges. As discussed below, the LPP process is simply proactive planning.

The LPP is a planning tool, not an action plan. The LPP is a proactive planning tool that helps us evaluate opportunities when they arise. For instance, if several landowners approach us with offers to sell lands, the priorities identified in the LPP help us to make wise use of very limited funds. The LPP provides guidance, but does not require any action by the landowner or the Service. Rather it is one of the management tools that helps guide land conservation efforts.

The LPP provides choices. The LPP provides options that may, in the right situation, benefit both the landowner and the Service. For instance, a Native corporation may propose a land exchange to obtain additional land around a village site or to trade wetlands for developable land. Another may be interested in selling easements or distant holdings to generate capital. Before pursuing any course of action, both parties must agree that it is in their best interest to proceed.

Our priorities reflect the quality of the habitat. We use a computer model to analyze priorities. Criteria which rank fish and wildlife habitats and their ability to contribute to the refuge mission are mapped in overlapping layers with the land status data to give a numerical rank to each parcel of land.

Public and State involvement is part of the process. We provide opportunities for local landowners and other interested parties to discuss the LPP process with us. State agencies review and comment on the LPP prior to publication and distribution.

**Land Protection Plan
for
Innoko National Wildlife Refuge
McGrath, Alaska**



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

July 2007



If you have questions or comments about the Innoko Land Protection Plan, please contact us at one of the following locations:

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Introduction

The U.S. Fish and Wildlife Service manages the Innoko National Wildlife Refuge (Innoko Refuge) as a unit of the National Wildlife Refuge System. The refuge consists of two non-contiguous units. The larger southern unit (Innoko Unit), managed by the Innoko Refuge staff in McGrath, is the focus of this plan. The smaller northern unit is managed by the Koyukuk Refuge and will be included in the Koyukuk Land Protection Plan.

The Service is charged with conserving the fish, wildlife and habitats of refuge lands for the benefit of present and future generations. However, this task is complicated by the fact that the Service does not own or have management authority over all of the land within the refuge boundaries. Of the 3,816,220 acres within the southern unit of the Innoko Refuge, other landowners have title or claims to about 239,586 acres* or about seven percent (Table 1).

Private landowners own or have selected about seven percent of the land within the southern unit boundary.

Refuge management may be complicated when refuge lands are interspersed with private lands.

Table 1. Land status overview for the Innoko Refuge as of March 2007

<i>Current Status</i>	<i>Acres¹</i>
Native Corporation (conveyed)	157,509
Native Corporation ² (selected)	79,209
State of Alaska (selected)	129
Native Allotments (conveyed)	7,798
Native Allotments (selected)	762
Other Patents ³	12
Total Conflicting Claims	(5,833)
Total Acreage Claimed by Other Entities	239,586
Refuge Land⁴	3,568,685

¹ Acreage figures are GIS-calculated approximations and are subject to change. Land status acreage figures in Alaska will not be finalized until conflicting/overlapping claims are adjudicated by the Bureau of Land Management and all inholdings are surveyed.

² Includes conflicting claims: parcels claimed by two or more entities

³ Trade and manufacturing site

⁴ Refuge lands selected by other entities are excluded.

*Acreages are Geographic Information System (GIS) approximations and may differ from the official number published in the USFWS "Annual Report of Lands Under Control of the U.S. Fish & Wildlife Service" as of September 30, 2005.

A Land Protection Plan does not obligate the Service or the landowner to take any action.

Most of the private lands within the Innoko Refuge will always be owned and managed by Native corporations, the State of Alaska, or private individuals. The LPP provides a framework for working with interested landowners to conserve key resources.

Refuge lands are managed to conserve fish, wildlife, and their habitats in their natural diversity. However, fish and wildlife range freely between refuge and private lands and depend on the health of the entire ecosystem. Just as management actions on Service lands can affect private landowners, actions on private lands may affect our ability to conserve wildlife. It is important for us to work with landowners to improve management of the Innoko Refuge. Our success depends on developing good working relationships with adjacent landowners.

This Land Protection Plan, or LPP, is the only report that focuses on private lands within the refuge boundaries. It explores the effects of private lands on refuge resources, and provides an opportunity to discuss key refuge issues and the ways we can work with private landowners to protect fish and wildlife resources.

As part of the LPP process, we prioritize all private lands in terms of their value to wildlife populations. In some cases, we may use these rankings to help us evaluate opportunities when they arise. For instance, if several landowners approach us with offers to sell, the priorities identified in the LPP help us spend our limited acquisition funds wisely.

Although this plan identifies more than 55,000 acres of high-priority private land in the Innoko Refuge, most will remain in private ownership. The LPP provides guidance, but does not require any action by the landowner or the Service. Rather it is one of the management tools that helps guide land conservation efforts.



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Important Resources

Landscape

Fires and floods shape the landscape of the Innoko Refuge. More than half of the refuge is low-lying, relatively flat, and blanketed with rivers, lakes, and sloughs. Natural features form some of the refuge boundaries: the Khotol Hills to the north, the Yukon River to the west and the Kuskokwim Mountains to the south and east. The Innoko River flows through the center of the refuge and forms the northern boundary of the Innoko Wilderness.

The refuge is bisected by the Innoko River. Refuge lands south of the river have been designated the Innoko Wilderness.

An extensive lowland area, the Innoko lowlands, spans the length of the Innoko River. To the west of the lowlands are the Kaiyuh Mountains which parallel the Yukon River. The Kuskokwim Mountains project into the refuge along the southern and western borders. The highest point in the refuge (1,330 feet) is in the Kaiyuh Mountains.

Flooding is common along the rivers and in the lowlands, especially during the spring. Seasonal flood cycles maintain extensive wet meadows of tussock grasses and sedges that are critically important to waterfowl. Bogs, with thick, floating mats of sphagnum moss and islands of black spruce and tamarack, are also scattered throughout the lowlands. They provide habitat for unusual plants, such as Andromeda (bog rosemary) and the carnivorous sundew.



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Fire and water shape the landscape of the Innoko Refuge.



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The northern hawk owl prefers sparse, open forest habitats. They may be found at the edge of burns or other clearings (immature hawk owl pictured).

An average of nearly 200,000 ducks return to the refuge each spring.

Low hills of spruce and birch dominate upland areas. Sparse forests of stunted black spruce favor poorly-drained soils underlain by permafrost; white spruce covers well-drained hillsides and other areas where the permafrost layer is deep enough to permit their growth.

Refuge vegetation represents a transition between the boreal forests of interior Alaska and the tundra communities of western and northern Alaska. Areas of subarctic tundra, underlain by permafrost, support a variety of scrub, peatland, heath meadow, marsh, and bog habitats. Tall scrub and forest habitats occur primarily in the northern portion of the refuge and along the Yukon River corridor.

The vegetation is strongly influenced by both fire and flood. Between the years 1950 to 2005, lightning-strike fires burned an average of about 51,257 acres/year. Overall, about 52% of the Refuge burned during that period. However, fires rarely burn evenly across the landscape. The fire's path is erratic—completely or partially burning some areas and jumping others. The result is a patchwork, or mosaic, of habitats in different stages of succession: a medley of meadows, shrublands, and forests of different ages. This variety of habitats can support more species than could a single habitat type. Each species has particular needs for food, shelter, and space that are best met by different habitats. In addition, the “edges” of a burn—where two or more plant communities meet—often supply a variety of needs for a variety of species. Therefore the mosaic created by recurrent fires and other natural disturbances can be beneficial to maintaining a healthy and diverse community of plants and animals.

Like fire, flooding is a defining force within the refuge. Much of the refuge is a relatively flat lowland drained by slow-moving river systems. Flooding at breakup is often extensive and tends to promote grass and sedge growth and inhibit the growth of woody shrubs. Flooding and subsequent drawdown of lakes and ponds recharges these systems with important nutrients and promotes lush vegetation growth.

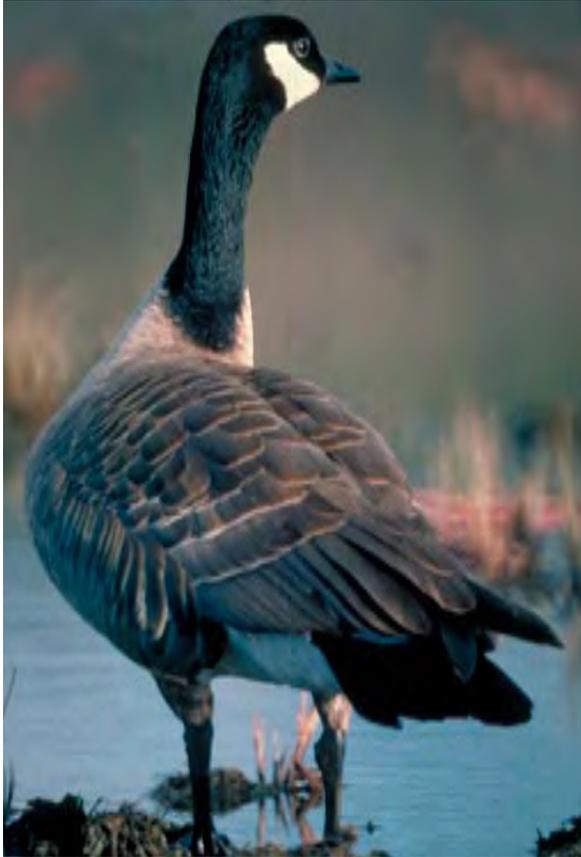
These two natural forces, fire and water, are the dominant influences on refuge vegetation. Together they create a healthy mosaic of habitats that support a wide variety of wildlife species.

Fish and Wildlife Resources

Birds—Numerous lakes, ponds, streams, bogs, marshes, upland forests and riparian corridors support a rich and varied community of bird species. An estimated 130 species of birds use the refuge and about 20 species are year-round residents.

The Innoko Refuge is one of the most important waterfowl production areas in interior Alaska. Thousands of white-fronted and Canada geese nest on scattered wetlands throughout the refuge. About 20,000 white-fronted geese molt in the southern part of the refuge, particularly along the Innoko and Iditarod rivers.

An annual average of about 190,000 ducks were counted on the refuge for the 22-year period from 1977 through 1998 (Conant 1999). Many use the refuge to rest and feed, before migrating to breeding



The refuge is critically important to two species of Arctic nesting geese. Taverner's Canada geese (above and left), a small-bodied race of Canada goose, nests and molts within the refuge, especially on the Innoko and Iditarod river systems.

Thousands of greater white-fronted geese (below) also nest and molt in the refuge. Most belong to the mid-continent population that winters in Texas and Mexico. However, a small percentage are Pacific flyway white-fronts that winter in central California to Mexico.

Small numbers of cackling Canada geese and Tule white-fronted geese also occur on the refuge.



Each year, loons return to the same area to breed and raise young. Nests are mounds of sticks or vegetation, typically constructed on island shorelines or points of land.



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grounds further north; others remain to nest within the refuge. The northern pintail is the most numerous duck species, followed by American wigeon, green-winged teal, and northern shoveler.

Other waterbirds that nest on the refuge include tundra and trumpeter swans, red-throated and Pacific loons, and red-necked grebes. Sandhill cranes, known for their elaborate courtship rituals, choose remote, inaccessible wetlands for nesting and raising their young.

Least sandpipers are among the shorebird species that nest within the Innoko Refuge. These small shorebirds probe damp mud and shallow waters for their invertebrate prey.



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Peregrine falcons (pictured above), ospreys, bald and golden eagles, and Harlan's hawks are among the raptors that nest on the refuge. Previously listed as endangered, peregrines have rebounded throughout much of their range.

Many shorebird species, including greater and lesser yellowlegs, long-billed dowitchers, Wilson's snipes, semipalmated plovers, Hudsonian godwits, northern phalaropes and several sandpiper species are known to breed in the expansive marshes, bogs and riparian areas of the Innoko Refuge. Shorebirds undertake impressive annual migrations that may exceed 10,000 miles. Some also have restricted breeding ranges. Hudsonian godwits, for instance, nest in only five limited areas of North America, including the Innoko Refuge. After leaving these breeding areas, most of the Hudsonian godwit population converges on James Bay, Ontario. From there, most fly directly to South America, crossing the western Atlantic in the process.

Gulls, jaegers and Arctic terns also nest on the refuge. The Arctic tern is legendary for its long migrations — flying to the edge of the Antarctic ice pack after fledging young reared in the Innoko Refuge and other Arctic locations. Their round trip journey, about 20,000 miles, is nearly the circumference of the earth.

Many landbirds breed within the refuge. Abundant insect populations, undisturbed riparian areas, and a mosaic of vegetation types provide habitat for a variety of songbirds, including warblers, sparrows, thrushes, finches, buntings, flycatchers, and waxwings. Most of these species winter in the lower-48 states, Mexico, the Caribbean, or Central and South America. However, some like the Arctic warbler return to wintering grounds on other continents. This diminutive warbler travels to wintering grounds in Asia after rearing young in the Innoko Refuge.

At least seventeen species of eagles, hawks, falcons, and owls have been observed on the refuge. Harlan's hawk, a subspecies of the red-tailed hawk, is the most common raptor. Ospreys have a worldwide distribution, but the Innoko Refuge is the northernmost limit of their breeding range in western Alaska. Within the Innoko Refuge, raptors commonly nest in isolated stands of trees, surrounded by graminoid and shrub habitats.

Mew gull



U.S. Fish and Wildlife Service

Ducks

American wigeon



Lee Karney

Lesser scaup



Lee Karney

Green-winged teal



Dave Menke

Greater scaup



Lee Karney

Northern shoveler



Dave Menke

Northern pintail



David Menke

Gadwall



Dave Menke

The wetlands of the Innoko Refuge are prime duck habitat. The northern pintail is the most numerous species. Aerial waterfowl breeding population surveys have counted an annual average of 56,000 pintails on the Innoko Refuge. The American wigeon is the second most numerous species (34,000), followed by green-winged teal (25,000), northern shoveler (24,000), mallard (16,000), and scaup (16,000).

Many other species are present in relatively low numbers. For instance, an average of 3,000 canvasbacks and less than 100 gadwalls use the refuge annually (Conant 1999).

Canvasback



Gary Kramer

White-crowned sparrow



Dave Menke

Fox sparrow



James Leupold

Yellow warbler



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Mosquitoes and other insects provide a rich food source for many bird species. At the height of the breeding season, the refuge is filled with the songs of thrushes, sparrows, warblers, and other songbirds.

Rusty blackbird



U.S. Fish & Wildlife Service

Gray-cheeked thrush



U.S. Fish & Wildlife Service

Varied thrush



Dave Menke



Robert Hines Artwork

Northern pike (above) and coho salmon (right) are common fish species in the refuge.

Fish and Amphibians – The Innoko Refuge is home to over 20 species of fish, including four species of salmon, several whitefish species, northern pike, Alaska blackfish, burbot, and pond smelt. The chinook salmon that spawn in the Innoko River are part of the Yukon River run, one of the largest natural salmon runs in the world. The Alaska record northern pike, weighing in at 38.5 pounds, was landed on the Innoko River in 1991. Some predict the next world-record pike will come from this area, as well.



Dave Menke

A single amphibian, the wood frog, is found on the refuge. The wood frog is a small-sized frog and the only amphibian able to tolerate the severe winters of the Innoko Refuge. Wood frogs can withstand being frozen to at least -5° Celsius (23° Fahrenheit) by increasing the amount of glucose stored in their cells. The high glucose concentration acts as antifreeze, protecting the fluid inside the cell membrane from freezing. In addition, the interstitial fluid, or fluid between the cells, can freeze without killing the frog. In fact, the wood frog can survive the winter even if a third of its body fluids freeze solid (USGS 2002). Although common in insects, there are only a handful of vertebrate species that are able to tolerate freezing and thawing.



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Compared to other species, the wood frog develops very rapidly from egg to tadpole to frog. This rapid metamorphosis is an important adaptation to short northern summers.

Mammals – The refuge provides habitat for a variety of mammals, including black and grizzly bears, moose, wolves, lynx, wolverines, river otters, beavers, muskrats, and porcupines.

The refuge contains excellent moose habitat. Frequent flooding along rivers and streams enriches the soil and helps maintain the riparian willow habitat necessary for winter browse. The last complete moose survey of the Innoko Refuge occurred in the winters of 2000 and 2002 (one half of the refuge was covered each year). This survey resulted in a population estimate of 1,960 moose in the southern half, and 1,724 moose in the northern half of the refuge and a total population estimate of 3,684 moose (0.6 moose/mi²). In winter 2005, an interagency moose population estimate for the Yukon River valley from Blackburn Island (north of Grayling) to Pike Lake (south of Holy Cross), an area with even better moose habitat, found an average density of 0.9 moose/mi².

Wolves are present in low to medium densities throughout the

Wolf



Tracy Brooks

Grizzly bear



Barry Reswig

Mammals

Lynx



Erwin and Peggy Bauer

Black bear



Mike Bender

Beaver



Tom Smylie

River otter



Dave Menke

Muskrat



Dave Menke

Marten



Erwin and Peggy Bauer

Red fox



Lisa Hagblom





U.S. Fish and Wildlife Service

Large mammals such as wolf, moose, bear, lynx, and caribou are found on refuge lands.

refuge. The number of wolves using the refuge is unknown, however ADFG estimates that 1330-1800 wolves range within a 60,500 mi² area that includes the 6,000 mi² Innoko Refuge (ADFG 2003a).

Other furbearers, including lynx, marten, red fox, wolverine, mink, beaver, river otter, and muskrat also live in the refuge. Lynx and marten inhabit upland areas; beaver occur throughout low-lying areas. The highest beaver densities occur along the Yukon River corridor. Wolverines are present in low to medium densities along the Yukon River corridor and a portion of the Innoko River. Furbearer populations, in general, are thought to be stable or increasing throughout the area (ADFG 2001).

Both black and grizzly bears use the refuge. The higher elevation areas are moderately good grizzly bear habitat while the low-lying areas are less favorable. Black bears are most common in the forested areas of the refuge.

A small herd of caribou, the Beaver Mountains Herd, uses refuge lands. The herd calves in the Beaver Mountains, south of the refuge, but postcalving and wintering groups regularly use the southern portions of the refuge. The herd appears to have declined substantially since the early 1960s. In 1963, the herd was estimated to number about 3,000 caribou; in 2003 herd size was estimated at 150-200 caribou (ADFG 2003).

A small herd of caribou uses the southern portion of the refuge.



U.S. Fish and Wildlife Service

A Changing Environment?

These habitats and others across Alaska appear to be on the brink of potentially significant changes as a result of a warming climate. Because climate is intricately intertwined with other components of the ecosystem it is hard to predict or fully understand all the potential ramifications. However recent trends suggest that the warming climate may increase surface drying — shrinking water bodies and lowering the water table (Riordan et al. 2006, Hinzman 2005). This in turn, may trigger more frequent fires and insect outbreaks. Thawing permafrost could further disrupt the normal hydrology of the area and produce changes in soils, plant communities and animal populations. Although our crystal ball does not allow a clear picture of what the Innoko Refuge may look like in 100 years, it could change dramatically from its current state.





Land Status

Two acts of Congress, the Alaska Native Claims Settlement Act of 1971 (ANCSA) and the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 determined the current land ownership patterns of the Innoko Refuge. ANCSA authorized the formation of village and regional Native corporations and enabled them to select and gain title to large blocks of Federal land. ANILCA established the refuge.

Refuge boundaries were drawn roughly along or near major ecological features, such as rivers or watershed boundaries, regardless of existing land ownership patterns. Consequently, the refuge boundaries incorporated lands that are owned or selected by individuals, Native corporations, or the State of Alaska.

The exterior boundary of the southern unit encompasses approximately 3,816,220 acres. Regional and village Native corporations currently own or claim about 236,718 acres. In addition, privately-owned or selected small parcels, including 71 Native allotments are scattered across the refuge. The remaining 3,568,685 acres of land are administered by the refuge (Figure 1). This chapter summarizes the history and current land ownership patterns on the refuge.

History

The Athabaskan people lived in this area long before the first white men explored interior Alaska. In addition to winter villages, the Athabaskans used a number of seasonal spring and summer campsites to harvest furbearers, waterfowl, caribou, and other game species. Other camps, often located near river forks or along the Yukon River, offered access to salmon, whitefish and seasonal berries. In the 1840s, a Russian exploration documented a number of villages along the Innoko River, including some that were probably seasonal camps (Michael 1967).

In the early 1900s, the discovery of gold along the Innoko River and its tributaries resulted in the first influx of white men into the area. Supply towns and connecting trails sprang up. Branch trails connected the gold-mining support towns of Iditarod and Dishkaket to the overland mail trail between Seward and Nome. The gold boom was short-lived, however, and many supply towns and roadhouses were soon abandoned. Today, there are no communities inside refuge boundaries. The native village of Holikachuk was the last to be abandoned after residents relocated to the village of Grayling in the early 1960s.

In 1971, the Alaska Native Claims Settlement Act passed into law. ANCSA legally settled Native aboriginal claims, while accommodating State and conservation interests. Three Native corporations, formed as a result of ANCSA, claimed lands that

The Innoko National Wildlife Refuge was established by ANILCA in 1980.

Native village and regional corporations own or claim approximately 236,718 acres within the refuge boundaries.

Gold rush fever brought the first influx of non-natives to the region.

were later incorporated within refuge boundaries. Nine years later, on December 2, 1980, President Jimmy Carter signed the Alaska National Interest Lands Conservation Act (94 Stat. 2371). Among other things, ANILCA established the Innoko Refuge. Its boundaries included lands previously selected by Native corporations and the State of Alaska.

Two village corporations own or claim about 77,235 acres of land inside the refuge.

Refuge land status will continue to change as selected lands are conveyed, relinquished or rejected.

The regional corporation, Doyon, Limited, owns or claims about 159,483 acres of land inside the refuge.

Nearly 7,800 acres have been conveyed as Native allotments.

Certain Vietnam veterans or their heirs could apply for an allotment (160 acres or less) under the provisions of the Vietnam Veterans Allotment Act of 1998 as amended (Public Laws 105-276 and 106-554).

Village Native Corporation Land

Two village Native corporations, the Zho-Tse Corporation (Shageluk) and Hee-yea Lingde, Incorporated (Grayling) have land holdings within the refuge. Each corporation has a total land entitlement of 92,160 acres and each has taken some of this entitlement outside the refuge as well as within. As of March 2007, about 15,327 acres inside the refuge have been conveyed to the Zho-Tse Corporation and an additional 7,481 acres have been selected. These land selections, however, include 5,833 acres that are also selected by Doyon, Limited, the regional corporation (Table 2). The Hee-yea Lingde Corporation owns a total of 41,926 acres within the refuge and has selected another 12,501 acres. The land status within the refuge will change as selected lands are conveyed, relinquished, or rejected. However, under the provisions of the Alaska Land Transfer Acceleration Act of 2004 (P.L. 108-452) the land status should be finalized by 2009.

Regional Native Corporation Lands

Doyon, Limited, holds title to about 100,256 acres of land and has selected an additional 59,227 acres within the Innoko Refuge. About 5,833 acres of these claims, however, conflict with those of the Zho-Tse Corporation.

According to the conveyance rules of ANCSA [Section 14(f)], Doyon is granted the subsurface rights to the lands conveyed to both Zho-Tse and Hee-yea Lingde village corporations. This provision gives the regional corporation the rights to potentially valuable mineral interests, but gives the village control of the surface lands necessary to supply their subsistence and economic needs.

Native Allotments

Until its repeal in 1971, the Native Allotment Act of 1906 authorized Alaskan Natives to claim up to 160 acres of land. In addition, a 1998 amendment to ANCSA (Section 432 of P.L. 105-276 [43 U.S.C. 1629g]) authorized qualified Alaskan Native Vietnam veterans to apply for an allotment if they had not previously done so. The 1998 law addressed the concern that military service may have prevented some Native veterans from applying for an allotment under the 1906 Act. The application period for these new allotments closed on January 31, 2002.

To date, a total of 65 allottees have been deeded a total of 7,798 acres within the southern unit. Another 762 acres (seven parcels) are selected, including a total of five Vietnam veteran allotment claims (about 547 acres).

Table 2. Surface land status¹ of the Innoko Refuge (Innoko Unit) as of March 2007

Category of Lands	Landowner	Acres Conveyed ²	Acres Selected	Total Acres ³	Conflicting Land Claims ⁴
Federal - Refuge	United States	3,568,685		3,568,685	0
State Government	State of Alaska		129	129	0
Native Allotments	Many (71 landowners)	7,798	762	8,560	0
Regional Native Corporation	Doyon Ltd	100,256	59,227	159,483	5,833
	Total Regional Corp.	100,256	59,227	159,483	
Other Private		12		12	0
Village Native Corporation	Hee-yea Lingde, Incorp. (Grayling)	41,926	12,501	54,427	0
	Zho-Tse Corporation (Shageluk)	15,327	7,481	22,808	5,833
	Total Village Corporation	57,253	19,982	77,235	
	Total Conflicting Claims			(5,833)	
	Total Lands (Acres) Conveyed/Selected			239,586	

¹ Acreage figures do not include submerged beds of meanderable water bodies (rivers of 198 feet or more in width and lakes of 50 acres or more). There are approximately 44,790 acres of these water bodies on refuge lands, and about 7,950 acres on conveyed and selected lands. Ownership of the submerged lands beneath these water bodies depends on the navigability status and is yet to be determined for many of the water bodies. No ownership of the land beneath these water bodies is implied in this table.

² Includes patented and Interim Conveyed (IC) lands. Only land claims within the refuge boundary are reported.

³ All acreages are GIS-calculated approximations and may differ from official acreage figures reported elsewhere. All data are from Master Title Plats maintained by the Bureau of Land Management.

⁴ Acreages figures include conflicting selections and may include land covered by water.

⁴ Acres of land selected by more than one entity

Other Private Patents

Congress extended the nation's principal land laws to Alaska in 1884. Many of these laws were designed to encourage private settlement and improvement of public lands. There is only one private patent within the boundaries of the refuge. This patent was issued for a Trade and Manufacturing site, totaling about 12 acres. The Trade and Manufacturing Act of 1898 allowed a cash entry for up to 80 acres of land to be used as a place of business.

The State of Alaska has selected a 129-acre tract of land within the refuge.

State of Alaska

The State of Alaska has selected a 129-acre parcel of land on Bullfrog Island in the Yukon River (Figure 1). The Alaska Statehood Act (PL 85-508) entitled the State to select 102,550,000 acres of vacant, unappropriated and unreserved land under the

general grant, and to select an additional 400,000 acres to promote development and expansion of communities. The State was also granted title to most of the existing roads, airfields, and associated facilities under the Alaska Omnibus Act (Public Law 86-70).

Submerged Lands

In general, the lands beneath tidelands and inland navigable waters were granted to the State of Alaska by the Equal Footing Doctrine, the Submerged Lands Act of 1953, and the Statehood Act of 1958. However, lands beneath water bodies that were reserved or withdrawn by the Federal government prior to statehood on January 3, 1959, may have been retained by the United States. If the U.S. did not reserve or withdraw submerged lands, then the ownership of submerged lands is determined on the basis of navigability. If a water body is navigable, the underlying bed of the river or lake belongs to the State; if non-navigable, the bed belongs to the adjacent landowner(s).

In most cases, ownership of submerged lands within refuge boundaries depends on whether the water body is navigable.

Undoubtedly, the Innoko Refuge contains both navigable and non-navigable waters. However, the status of many water bodies has not yet been determined. Any disagreements between the State and Federal governments over what waters are navigable or non-navigable are generally resolved through the Federal courts.

Although judicial action through the Quiet Title Act has been the primary means of clearing title to submerged lands, recent Bureau of Land Management regulation changes regarding recordable Disclaimers of Interest may provide an administrative means to clear title to submerged lands. Disclaimers of Interest (RDI) are legal documents that allow the Secretary of Interior, acting through the BLM, to disclaim land interests that have terminated or are invalid. In February 2003, the State filed its first Disclaimer application for submerged lands beneath the Black River in northeast Alaska. An RDI for the Black River was issued later that year. The State has filed a number of subsequent applications, but none have been for submerged lands within the Innoko Refuge.

Adjudicating the extent and boundaries of navigable waterways may take many years to resolve. In the meantime, the Service is working with the State on a case-by-case basis regarding management of major waterways that may be determined navigable.

17(b) Easements

Section 17(b) of ANCSA requires the Federal government to reserve easements for access to public lands or waters whenever land is conveyed to Native corporations. Easements are reserved to ensure access to public lands and waters that would otherwise be completely blocked by conveyed Native corporation lands. Easements can be linear (i.e. roads and trails), or one-acre sites for use as temporary campsites and/or to change modes of transportation. Each 17(b) easement reserves a right to use land owned by another for a specified purpose. Public activities, such as recreation and hunting are not authorized on the easement or on the private lands surrounding the easement or through which the easement passes. The conveyance document describes in detail each 17(b) easement and the specific use(s) reserved by that easement.

Easements reserved under section 17(b) of ANCSA provide access across private lands to public lands and waters.

Currently, there are two one-acre site easements and one trail easement in the Innoko Refuge (Figure 1). However, additional 17(b) easements may be created as the Bureau of Land Management conveys the remaining land entitlements to Native corporations. Currently, a one-acre site easement and two trail easements have been proposed for selected lands in the Innoko Refuge. If these lands are conveyed, easements and their allowable uses will be described in the conveyance document. Public easements are created at the time they are reserved in the conveyance document.

Asserted RS-2477 Rights-of-Way

The State of Alaska asserts numerous claims to roads, trails, and paths across Federal lands under Revised Statute 2477. This section of the Mining Act of 1866 (codified as 43 U.S.C. 932) provided that “the right-of-way for construction of highways over public lands, not reserved for public use, is hereby granted.” RS-2477 was repealed by the Federal Land Policy and Management Act of 1976, subject to valid existing claims. Under authority of the Federal Land Policy and Management Act, the Bureau of Land Management expanded the regulations at 43 CFR 1864 to allow the State of Alaska and others to apply for Federal “disclaimers” for routes of travel that applicants believe qualify as RS-2477 rights-of-way.

The State considers a number of historical transportation routes within Alaskan refuges to be valid RS-2477 claims. Twelve routes totaling 292 miles are located within the Innoko Refuge (Figure 2; Table 3). In addition to specific routes, the State also claims section line easements within the refuge. If any of these claims are

The State has identified 12 possible RS-2477 claims in the southern unit of the refuge.

Until its repeal in 1976, Revised Statute 2477 authorized the development of public access routes across unreserved public land.

Table 3. Mileage of asserted RS-2477 rights-of-way within the Innoko Unit of the Innoko Refuge

<i>Reference Number</i>	<i>Route Name</i>	<i>Total Mileage in Refuge</i>
731	Cripple-North Fork Innoko River	6.36
730	Cripple Landing-Rennie’s Landing	22.98
557	Dikemon-First Chance Creek Trail	14.64
63	Dishkaket-Kaltag Trail	40.91
556	First Chance Ck Across Glacier-Horsefly Trail	5.30
97	Iditarod-Dishkaket Trail	69.87
129	Lewis Landing-Dishkaket Trail	29.24
161	Nulato-Dishkaket Trail	40.91
164	Ophir-Dishkaket Trail	23.02
732	Rennie’s Landing-Cripple Landing (South)	27.06
506	Shageluk-Holikachuk Winter Trail	7.17
165	Ophir-Iditarod	4.54
Total Miles		292.00

¹ Information from State of Alaska RS-2477 database (digital date: March 23, 2006)

determined to be valid, they could be developed as transportation corridors by the State.

Identification of potential rights-of-way does not establish the validity of these claims, nor the public's right to use them. In the absence of specific regulation or law, the validity of all RS-2477 rights-of-way will be determined on a case-by-case basis, either through the courts or by legally binding agreement of all landowners.

Mining Claims

Placer gold mining in the headwaters of the Innoko river drainage began with the discovery of gold in Ganes Creek in 1906. In 1908, gold was also discovered in the Iditarod River drainage. Although the boom days were short-lived, some mining activities have continued more or less continually in the Innoko and Iditarod river drainages since the first discovery. Most of the activity has occurred upstream of the refuge (Mueller and Matz 2002).

Historically, there were 77 mining claims in what is now the Innoko Refuge. No active claims remain and Refuge land is closed to new claims. However, placer gold mines are still operating upstream of the refuge and private landowners may mine their refuge inholdings if they choose. Until its recent closure, the largest mine in the area was the Illinois Creek Mine, located about six miles north of the refuge (Figure 1). The first large-scale heap-leach gold mine in Alaska, the Illinois Creek Mine produced gold through a cyanide extraction process (Mueller and Matz 2002). The mine and facilities are located on State-owned land above both banks of Illinois Creek, a tributary of the Little Mud River.

Placer gold and platinum metals are also being recovered from Boob Creek, just outside of the eastern refuge boundary (Figure 1; Township 25 S, Range 10 E KM). The mining history of Boob Creek dates back to the winter of 1915-1916 when prospectors first discovered deposits of gold and platinum (Dashevsky et al. 2002). The discovery sparked a short-lived gold rush to the area that faded within a few years. Small-scale prospecting and mining continued intermittently until the mid-1960s. Boob Creek was re-staked during the 1980s and exploration and small-scale mining have continued since that time.

Wilderness

With the passage of ANILCA in 1980, Congress established the Innoko Wilderness. Most refuge land to the south and east of the Innoko River lies within this 1,321,890-acre Wilderness area. Much of the Innoko Wilderness is a low-lying wetland drained by two meandering rivers, the Yetna and Iditarod. Innumerable small lakes, streams, and bogs receive nutrient input from a cyclic flooding and drawdown regime. The result is an extremely productive area that is critically important to nesting and migrating waterfowl and many other bird species.

There are no lode or placer mining claims in the refuge.



Leslie Kerr, U.S. Fish & Wildlife Service

The Innoko Wilderness was created by ANILCA in 1980.





Refuge Management Concerns

The Innoko Refuge is managed to conserve refuge resources while accommodating the rights of private landowners.

There will always be private lands within the Innoko Refuge.

Land conservation measures can help us maintain the health and integrity of the entire system.

The Innoko Refuge is managed to conserve native fish and wildlife populations and habitats, while providing opportunities for subsistence and compatible types of wildlife-dependent recreation (e.g. hunting, fishing, wildlife viewing, and photography). In practice, management issues are often complex; management decisions may be a compromise between conflicting values and competing interests of various user groups. The task is complicated if there is a patchwork of public and private lands within refuge boundaries.

The Innoko Refuge contains less private land than most Alaska refuges; about seven percent is privately owned or selected. Most of these lands will always be owned and managed by Native corporations or private individuals. Refuge goals and policies are designed to accommodate the rights of these landowners while conserving refuge resources. However, building cooperative agreements and/or acquiring key lands or easements from willing owners may help us address management concerns.

This section is not an exhaustive discussion of all refuge management issues. Instead, it briefly reviews some refuge management concerns that might be addressed through particular land actions.

Maintaining Healthy Ecosystems

The Innoko Refuge currently supports relatively undisturbed and intact ecosystems. Maintaining the integrity of these systems is one of our primary concerns. Characteristics such as species diversity, functioning of natural ecological processes, patterns and connectivity of lands and waters, and the balance between species and their environment are indicators of the health of the system. While humans can be an integral part of such a system, they also have the potential to alter its delicate balance.

Disruption of Natural Balance - Every species is part of a food web. These webs, which represent feeding relationships among the various species, may be relatively simple or quite complex. In an undisturbed natural system, predator and prey coexist in an equilibrium. Their interactions may result in cycles in population numbers, but each species coexists with the others through time. In many cases, humans have been a part of this equilibrium for eons. However, if new or rapidly expanding human populations are added to the equation, the impacts can be both complex and unexpected.

Certain species readily adapt and thrive near human populations. Their success may then impact other species in the food web. Ravens, for example, are adept at scavenging discarded human food wastes and thrive near human habitation. The local raven

Some species may thrive near human habitation at the expense of other species. Ravens and red foxes are among the species that readily adapt to humans.

Minimizing fragmentation helps maintain natural species diversity.

By acquiring key parcels, we may be able to minimize negative impacts to fish and wildlife in the refuge.

Commercial lodges and ecotourism operations on private lands can improve the opportunities for public use and enjoyment of adjacent refuge lands.

Human disturbance in key habitats can displace sensitive wildlife species.

population may increase as food resources become more abundant and dependable. In turn, this increase may depress numbers of the raven's natural prey, as the inflated raven population preys on seasonally available eggs of nesting bird species. Without a source of human food, the growing raven population would likely plummet when its natural food supply is exhausted, allowing the prey species to recover. However, the addition of the human component—and a reliable back-up food supply—may permanently alter the equilibrium of the natural system.

Fragmentation - From the standpoint of maintaining integrity and biodiversity, it is important to protect the natural pattern and connectivity of habitats. Larger blocks of habitat are better for maintaining some wildlife populations than smaller blocks; connected blocks of habitat are better than isolated ones. Well-planned development can minimize or prevent adverse impacts by preserving migration corridors and concentrating development in localized areas away from sensitive habitats and wildlife concentrations.

Habitat Loss and Displacement - In some sensitive locations, land uses such as major construction projects, resource extraction, and road construction have the potential to displace wildlife, degrade habitat, and impact fish and wildlife populations. These land uses may modify the surface vegetation, change water flow and drainage patterns, increase soil erosion and sedimentation, and fragment or degrade key wildlife habitats.

In some cases, wildlife may abandon key habitats or stop using traditional migration routes. Fencing may influence animal movements or prevent access to former habitat areas. Domesticated animals, especially dogs and cats, may kill or harass wildlife. Unintentional pollution from faulty septic systems and landfills, or run-off from roads, construction sites, mines, waste piles, and tailings can pollute lands and waters. Fuels, oil, cleaning agents, and sewage are among the common pollutants that leach into surface waters. These chemicals can easily spread long distances via waterways—affecting fish, wildlife, and water quality far from the source.

Some private lands within the refuge have the potential for development as camps, lodges, or eco-tourism operations. When operated with care, commercial services and facilities improve opportunities for public use of refuge lands and waters. Compatible recreational activities such as hunting, fishing, wildlife observation, photography, and environmental education are recognized in law as priority public uses on National Wildlife Refuges and are encouraged and promoted on refuge lands. In some situations, however, lodges can act as a point from which human disturbance spreads out into the surrounding refuge lands. Popular destinations and major travel routes may receive much more use if there are commercial guides or lodges in operation. If this use occurs in the more sensitive habitats, wildlife species may be affected.

Tundra swans, for example, are very sensitive to disturbance during the nesting season. They are likely to abandon nest sites that are repeatedly disturbed by airplanes, boats, or foot traffic. Minimizing disturbance in key habitats during critical time periods is essential

to the continued health of species that are sensitive to noise and visual disturbance during part of their life cycle.

Noise, permanent structures and other evidence of human presence can alter nearby Wilderness values.

Wilderness Values

The Wilderness Act of 1964 defines Wilderness as “untrammeled by man ... retaining a primeval character and influence, and without permanent improvements or human habitation.” Wilderness offers “outstanding opportunities for solitude or a primitive and unconfined type of recreation.”

The Service is committed to the preservation of refuge Wilderness qualities. Certain uses on private lands have the potential to affect the aesthetic, experiential, and symbolic values of adjacent Wilderness areas. Even noise and visual presence can have effects that reach beyond property boundaries to degrade Wilderness values on surrounding refuge lands.

Access to refuge inholdings is guaranteed by ANILCA.

Section 1110(a) of ANILCA authorizes the use of snowmachines (during periods of adequate snow cover and frozen river conditions), motorboats, and airplanes for traditional activities and for travel to and from villages and homesites. In addition, under §1110(b) any landowner with a valid refuge inholding, including property within a Wilderness area, is ensured adequate and feasible access to their property for economic or other purposes. Access routes across Wilderness lands to private parcels may degrade Wilderness characteristics. Motorized travel can disrupt the quietude of refuge visitors using non-motorized access methods to seek a Wilderness experience.

Complex intermixed land ownership patterns can complicate Wilderness management. Within the Innoko Wilderness boundary, more than 6,200 acres have been conveyed to, or selected by, private landowners (Figure 1). The conveyances include 14 Native allotments (15 parcels) totaling nearly 1,400 acres, and Native corporation conveyances (Zho-Tse, Incorporated) and conflicting selections (Zho-Tse, Incorporated and Doyon, Limited). Human activity or development on these private inholdings has the potential to affect the Wilderness qualities of adjacent refuge lands.

User Group Conflicts

Providing the opportunity for a subsistence lifestyle is an important purpose of the Innoko Refuge.

Residents in communities near the refuge devote a considerable amount of time to subsistence hunting, fishing, and gathering. The subsistence lifestyle is part of the cultural fabric of Native communities. Providing the opportunity for this lifestyle is one of the primary purposes of the Innoko Refuge.

Wildlife-dependent recreational activities are also recognized in law as priority public uses on National Wildlife Refuges. Innoko offers both hunting and fishing opportunities that are likely to attract increasing numbers of visitors to the refuge.

Visitors often have values and cultural backgrounds that differ substantially from those of local residents. For instance, many sport fishers employ catch-and-release fishing. Often local residents view catch-and-release fishing as disrespectful and fear that it may result in a loss of those resources for future generations. Local residents are also concerned that non-local hunting will affect either the local abundance, or the migration path of traditionally harvested

Wildlife-dependent recreational activities are recognized in law as priority public uses on National Wildlife Refuges.

animals. Local communities and kinship groups often view certain areas as traditional subsistence-use sites. When subsistence users find a traditional site occupied by recreational users, conflicts can occur. Direct confrontations are rare, but subsistence users may be displaced from their usual fishing or hunting time or place.

Recreational users may also inadvertently stray onto private lands that are scattered throughout the refuge. It is often difficult for refuge visitors to tell where private lands begin. Trespass issues and competition for refuge resources may lead to conflicts between visitors and local residents.

Consolidating Land Ownership Patterns

Land ownership patterns can substantially influence resource management options for wildlife refuges. Within the Innoko Refuge, most of the lands selected by or conveyed to village and regional Native corporations are found in large contiguous blocks. Many of the individual Native allotments are concentrated in these areas. However, there are also numerous private parcels that are surrounded by refuge lands. Depending on how these parcels are used, they have the potential to fragment wildlife habitats, affect natural disturbance processes, and limit the management tools available to refuge managers.

Complex land ownership patterns also increase the potential for conflict between landowners and refuge users. Refuge visitors are often unaware of ownership boundaries, and may wander onto or use private lands as if they were refuge lands.



Resource Protection Methods

Existing Resource Protections

State and Federal Laws and Regulations: Various Federal and State laws have been enacted to protect certain key resources. For example, development in the vicinity of lakes or rivers is subject to State water quality laws and the Federal Clean Water Act. Other Federal laws regulate human activities affecting migratory birds, wetlands, and threatened or endangered species.

The State imposes regulations to conserve fish and game species. Fishing, hunting and trapping regulations strive to limit harvest to a sustainable level. The Alaska Department of Fish and Game has the primary responsibility for managing and conserving resident fish and wildlife populations throughout the State.

Mineral Development: No recoverable quantities of oil have been discovered on the Innoko Refuge and the potential appears to be low. However, private landowners can pursue oil and gas development on their lands if they choose. By contrast, oil and gas exploration and development on refuge lands would only be allowed if the Secretary of the Interior determined these uses to be in the national interest and if the refuge Comprehensive Conservation Plan were amended (CCP amendments include a public review process and the completion of a refuge compatibility determination). Seismic and geophysical exploration would require a Special Use Permit with site-specific stipulations to ensure compatibility with refuge purposes and consistency with CCP management objectives.

Under the authority of Section 304(c) of ANILCA, the refuge is closed to new locations, entries, and patents. Mineral assessment techniques that do not have lasting impacts are permitted throughout the refuge, but such activities require a Special Use Permit complete with provisions to ensure compatibility with refuge purposes and consistency with CCP management objectives.

Options for Additional Resource Protection

Interested landowners can work with us in a variety of ways to further protect natural resources on their lands. The options range from simple cooperative land management agreements, to selling key parcels of land to the Service. It is important to note that these options are entirely voluntary on the part of the landowner. We will take no action unless the landowner wants to work with us. Together the Service and a willing landowner may find that one of the following methods provides a mutually beneficial way to protect natural resources.

Cooperative Agreement: A landowner and the Service may establish a formal written agreement in which each party agrees to manage the land in a manner that benefits wildlife (Sections 304(f) and 809

Nationwide environmental legislation, including the Federal Clean Water Act, the Clean Air Act, and the Endangered Species Act provide a level of resource protection on both public and private land.

The Service will consider only those resource protection options beneficial to both the landowner and the Service.

Participation in any of these options is entirely voluntary.

A cooperative agreement is a working partnership between a landowner and the Service.

of ANILCA). For example, a landowner may agree to maintain or restore important wildlife habitats located on their lands. In return, we may help develop land management plans or provide expertise and assistance restoring damaged wildlife habitats.

Cooperative agreements place no legal restrictions on the land. No money is involved, and either party may cancel the agreement after giving adequate notice to the other party. Because landowners or management priorities may change, cooperative agreements do not grant permanent protection to fish and wildlife resources. However, cooperative agreements can help develop positive, working relationships between local landowners and the refuge.

A lease is a short-term rental of property.

Lease: A lease is a short-term agreement for full or specified use of a parcel of land. The lease generally gives the Service occupancy rights and the landowner receives a rental payment based on fair market value. When the lease is terminated, all rights revert back to the landowner. This option is useful when management objectives are short-term, or the owners are unable to provide other forms of land transfer. We will rarely enter into a long-term lease because the cost of the lease can eventually exceed the cost of purchasing the land outright.

Easement: An easement is the transfer of limited property rights to another. Easements specifically allow or prohibit certain land uses. For example, an easement may allow public access across the property or restrict certain types of development that are not compatible with resource management objectives. Easements are legal agreements that become part of the title to the property and are usually permanent. If the property is sold or inherited, the easements continue as part of the title.

A conservation easement is a transfer of limited property rights and is intended to restrict certain types of development.

A conservation or non-development easement is one of the most common easements acquired for land protection. Designed to prevent destruction or degradation of wildlife habitat, these easements often limit or prevent land development while allowing the landowner to retain the property. They may also allow refuge staff to manage uses of the land to benefit wildlife. Typically, we consider purchasing conservation easements only when lands supporting key wildlife habitats are at high risk for development. The terms of each conservation easement are unique. We must work with the landowner to develop the specific conditions or restrictions to be included in a particular conservation easement. Once in place, conservation easements must be monitored by refuge staff to ensure that the terms of the agreement are being met.

Easements usually reduce the market value of a piece of property. The tax assessed value of property with a conservation easement is often lower than the market value. The result is a tax savings for the landowner, but only if the land is taxable. The tax relief benefits of conservation easements are rarely important in Alaska since undeveloped Native corporation lands cannot be taxed, and only incorporated boroughs or municipalities tax property owners. In Alaska, we occasionally purchase conservation easements, but generally for large parcels of land only.

Land Exchange: Sometimes a landowner wants to trade land for other lands managed by the Service. We are willing to consider these proposals in situations where both parties will benefit. For example, a landowner may wish to trade an isolated tract of

wetlands for a more accessible upland parcel that is less costly to develop. A land exchange may help consolidate land ownership, eliminating isolated tracts or checkerboard ownership patterns. However, because there are high administrative costs associated with land exchanges, we usually pursue exchanges only when large acreages are involved, when the parcel we would acquire by the Service has very high habitat values, and/or when the exchange would result in a significant consolidation of lands.

A land exchange is the trade of lands having equal market value.

Usually the lands (or interests in lands) to be exchanged must have approximately equal market value as determined by an appraisal. The market value for a property is based on the price paid for similar land being sold at the same time in the same general area. For the purposes of a land exchange, oil, gas, and mineral rights are considered interests in land. Due to differences in per acre land value, the size of parcels being exchanged may be quite different. In cases where the lands to be exchanged have substantially different values, cash payments may be used to make up the difference.

Most exchanges involve lands having equal value. However, Section 1302 of ANILCA authorizes exchanges of lands with unequal value in special circumstances. In these situations, both parties to the exchange must agree, and the Secretary of the Interior must determine the exchange to be in the public interest.

Donation: Some people choose to donate lands or interests in lands to the Service to benefit conservation programs and receive tax benefits. Land preservation may be an important legacy within a landowner's family, and land donation is a means of achieving that legacy. The landowner may place restrictions or reservations on the donated property. For example, a donor may want to reserve life-use of the donated land. In this case, the Service receives title to the land, but the donor has the right to continue to use the property during their lifetime, in accordance with the terms of the deed. Another option, donation by will, takes effect only upon the death of the donor.

Permanent resource protection and tax benefits are incentives for land donations.

Rather than making a donation directly to us, a landowner might consider donating land to a private conservation organization. Several organizations, such as The Nature Conservancy and The Conservation Fund, accept donations of land for wildlife conservation. These organizations may hold and monitor the donation themselves, or they may put the donated land in trust for future addition to the refuge. Donations of land to a conservation organization can often be accomplished quickly.

When a landowner donates lands to the Service or a conservation organization they may be eligible for some Federal income tax benefits. For additional information, interested landowners should consult with a tax advisor, local Internal Revenue Service office, or a private conservation organization that specializes in land conservation.

Purchase: In some cases, a property owner may want to sell their land to the Service. Purchasing land is the most direct means we have for obtaining land title. However, funding for land acquisition is very limited and competitive. Consequently, we must carefully prioritize the use of these funds. In most cases, lands we purchase are considered a high priority for resource protection at the National level.

The Service may buy land from a willing seller.

Our policy is to buy land only from people willing to sell. All purchases by the Federal government must be based on fair market value as determined by qualified appraisers. Usually, we only consider “fee title purchase” which means the government would acquire most rights to the property. However, in some cases the landowner may choose to withhold certain rights (such as use reservation, water rights, or mineral rights), or we may choose not to acquire these land interests. As with land donations, many types of use reservations can be negotiated.

In Alaska, we must offer landowners the opportunity to exchange lands before we will consider purchase.

In Alaska, the Service must offer to exchange lands prior to purchasing them outright (Public Law 105-277, Section 127). If the landowner is only interested in selling, he or she must indicate that the exchange offer was refused before the land purchase can proceed. Lands purchased by the refuge are managed in the same manner as the surrounding refuge land.

As with donations, non-profit conservation organizations may be able to purchase lands with exceptional wildlife values from a willing landowner. These organizations might then sell or donate the lands to the Service at a later date. Regardless of the method used to purchase lands, our policy is to buy land only from willing sellers.

We do not condemn land in Alaska.

Condemnation: The Alaska Native Claims Settlement Act stipulated that ANCSA lands could not be condemned (taken without the consent of the owner). Then in 1987, an amendment to ANCSA made all Native land and interests in land, conveyed pursuant to ANCSA, subject to condemnation for public purposes. However, it is a long-standing Service policy in Alaska that lands will not be acquired through adverse condemnation. We will acquire land only from landowners who want to sell their land.

No Action: The landowner or the Service may decide not to take action to protect wildlife resources on a particular piece of property. There are several reasons for a “no action” decision. Some landowners may not be interested in the land protection options available, and our policy is to work only with owners who want to work with us. On the other hand, even if the landowner is interested, we may decide that a parcel does not contain key wildlife habitat or that further protection is not warranted.

Funds are limited, and the Service can only consider lands having a high priority for resource protection.

A final reason for “no action” is that the Service may not have funding to pursue resource protection on a parcel of land. There are millions of acres of inholdings in Alaskan wildlife refuges and many of our methods have an associated cost. Many landowners desire to sell their properties, but acquisition is expensive. Even if we wanted to, we could not afford to acquire all refuge inholdings. There will always be inholdings in Alaska refuges, and cooperation with private landowners is often the best way to achieve fish and wildlife conservation on private lands.





Resource Protection Priorities

We set land conservation priorities for non-Federal lands inside the Innoko Refuge by considering habitat values, land ownership patterns, and other factors. We quantified and used some of these criteria in a geographic information system (GIS) computer model. Other criteria are more subjective and must be considered on a case-by-case basis.

The following sections explain why we develop land protection priorities, how priorities are established, and the priorities for the Innoko Refuge.

Background: The Alaska Priority System

In 1988, the Alaska Submerged Lands Act (Public Law 100-395) mandated that the Service identify statewide acquisition priorities for all inholdings within national wildlife refuges in Alaska. This was a huge task. Within Alaska refuges there are 16 million acres of land that have been conveyed to Native corporations, private parties, or the State. To rank these inholdings, the Service developed the Alaska Priority System (APS), a GIS model that overlays species distribution and abundance data with land status information.

The first step in using the APS model was to map the distribution and relative abundance of key species within each Alaska refuge. We concentrated on those species and groups for which we have a Federal trust responsibility, including migratory birds, endangered species, certain marine mammals and anadromous fish, and species whose conservation was identified in ANILCA as a purpose of individual refuges. We also mapped geographic areas within each refuge that had important management concerns involving public use, access, and wilderness management. Using a computer model this information was combined with the land status information and each private parcel was given a numeric score and a statewide rank.

Although originally developed to set statewide acquisition priorities, the model was subsequently modified for prioritizing parcels within individual refuges. We now use the model to rank privately-owned habitats for individual refuge Land Protection Plans.

In preparing the Innoko Land Protection Plan, we used a modified APS model (Appendix 1) to address resource issues specific to the Innoko Refuge. To the original model we added some species identified by the refuge staff as being of special interest or concern and eliminated others. Species were eliminated from the model if little was known about their distribution and relative density. We used the model to rank all conveyed Native corporation land, as well as conveyed or selected small parcels of 160 acres or less (referred to simply as “private lands”). Our model is a dynamic, rather than a static model, and may evolve over time as Service mandates and priorities change.

Our GIS analysis indicates which lands we believe have the highest value to fish and wildlife.

Relative Resource Values

About 24% of the total land area inside the refuge boundary ranks high priority in our GIS model (Figure 3). The majority of these lands are along river corridors or in wetlands in the Innoko Wilderness. About 51% of the land ranks low priority. It is important to note that none of the private lands are in these low priority areas. About 69% of the private lands are in medium priority areas; 15% are in medium-high areas; and 16% are in the highest priority areas. This indicates that all the private lands in the Innoko Refuge have important biological values worthy of protection. Our last step in the prioritization process was to use our GIS model to rank the private lands against one another — to get the relative priorities of just the private lands.

We recommend purchasing priority small parcels if the owners wish to sell.

Innoko Land Protection Priorities

We used the model to classify the private lands as high, medium, or low priority with approximately 33% of the total acreage in each category. Figure 4 shows the relative priorities of these private lands. Lands identified as high priority have the highest relative importance to the most species in our GIS model. In general, the highest ranking private lands are in riparian corridors, wetlands, and the Innoko Wilderness. Some are large tracts of Native corporation land; others are small parcels of 160 acres or less.

Consolidating lands may simplify management for both the refuge and private landowners.

A total of 61 small parcels (6,570 acres), ranging in size from 9 to 160 acres, are surrounded by refuge land (Figure 4). About 46% (3,060 acres) of these parcels ranked high priority in our GIS model. Because small parcels are easily bought and sold on the open real estate market, we recommend acquiring priority small parcels if landowners wish to sell. Acquiring scattered parcels in sensitive habitats ensures the land will remain in its natural state, simplifies refuge management by consolidating land ownership patterns, and increases recreational and subsistence opportunities.

Some corporation lands have high habitat value, but are not in need of additional conservation measures at this time.

Small parcels that are not on rivers or lake shores tend to be lower priorities. Limited access makes it unlikely that these lands will be developed. These parcels also tend to have lower biological values because they are located away from the more productive wetland and riparian habitats. However, acquiring these parcels would consolidate land ownership patterns. Any opportunity to purchase these parcels should be considered on a case-by-case basis.

Cooperative agreements and conservation easements are valuable tools for protecting resources on large tracts of private land.

We do not recommend pursuing additional land conservation measures for the large tracts of Native corporation land, even if they ranked high in our GIS model. In general, these lands are consolidated in large, contiguous blocks and pose no threat to refuge resources. We believe additional conservation measures are unnecessary at this time.

In addition, land acquisition is not always the best means for addressing resource threats or management concerns on these large tracts of land. In some cases, purchases, exchanges, or conservation easements are the most effective means to reduce impacts to refuge resources. Other times, cooperative agreements or other management or administrative strategies may provide a more cost-effective way to resolve a potential threat to refuge resources.

Furthermore, land exchanges and purchases are expensive options. Although large-tract landowners may be interested in pursuing one of these options, a lack of funding may limit our ability to act. We are always willing to consider proposals from landowners, but each must be evaluated on a case-by-case basis and may be declined because of insufficient funds.

We do not intend to acquire all lands with high resource values.

Although there are many high-priority parcels in the Innoko Refuge, we do not intend nor expect to purchase all of these lands. For many high-value lands, current uses are compatible with wildlife, and additional resource protection measures are unnecessary. Even if additional protection is warranted and the landowner wishes to sell, limited funding is a concern. We are unlikely to acquire sufficient funds to purchase more than a small number of the high-value private lands within the refuge. However, should there be willing sellers, acquiring priority parcels would merit consideration.

Other Factors May Influence Priorities

Our GIS model ranks lands based on its perceived biological values, but obviously other factors may influence our final priorities. These “other factors” are less tangible than the scores calculated by the model, but they can influence our actions, especially when we have the opportunity to buy land. For instance, if several landowners wish to sell parcels with similar priority scores, these factors can help us choose the wisest use for limited funds. Some of the factors we consider are:

- *the location of a parcel relative to villages, other private lands, and to refuge land*
- *the potential to consolidate ownership patterns and simplify management*
- *the type and ease of access to a parcel*
- *current and potential uses*

The Service seldom acquires small parcels embedded in larger tracts of private lands.

Location: Whenever a landowner offers to sell, we consider the location of the parcel in relation to other private lands. Acquiring small parcels embedded in a larger block of private land provides little benefit to refuge resources and can create additional management problems. Habitats located near a village or commercial development may already be affected by development. Acquiring a conservation easement or title to these lands may provide little benefit for fish and wildlife. Therefore, small parcels located near villages or within conveyed lands are usually low priority for additional protection measures.

On the other hand, small, isolated parcels embedded in refuge lands have the potential for far-reaching impacts on adjacent refuge resources, depending on their use and location. The parcel may act as a point from which human disturbance, habitat destruction or pollution radiates out into surrounding refuge lands. Protecting these isolated tracts can be very beneficial.

The presence of isolated private tracts may also complicate or preclude some types of management. For example, the difficulty and expense of protecting isolated private parcels may exclude the use of certain habitat restoration techniques, such as prescribed

burning, on adjoining refuge lands.

Consolidation: It is advantageous to both the Service and private landowners to manage large contiguous holdings, rather than numerous small tracts interspersed with lands controlled by other landowners. Native corporation lands are relatively compact and contiguous in the Innoko Refuge. The small parcels are much less consolidated than corporation land. Many are entirely surrounded by refuge lands. Acquisition of key parcels can be an important mechanism to consolidate refuge lands.

Access: The Innoko Refuge, like other national wildlife refuges in Alaska, is open to public and subsistence access in compliance with ANILCA. This includes the use of snowmachines, motorboats, airplanes, and non-motorized surface transportation for conducting traditional activities, and travel to and from villages and homesites. However, the Service can regulate access if necessary to protect refuge resources from damage. In addition to public access, the Service must provide reasonable access to all inholders. In some situations, access needs of private landowners could become a concern for the refuge. For instance, constructing a road through sensitive nesting habitat to develop private lands could impact refuge wildlife populations.

We consider access issues when setting land protection priorities.

When we develop land conservation priorities, we must consider our responsibility to allow access to inholdings, provide opportunities for public use of refuge lands, and protect fish and wildlife resources from the impacts of these uses. In some cases, we may be interested in acquiring certain lands to improve public access or to manage access for the purpose of protecting resources in key areas.

Current and Potential Land Uses: When setting priorities, we consider existing or potential land uses that could affect wildlife, their habitats, or other important refuge resources. Certain parcels are more likely to be developed in ways that can harm wildlife. Site characteristics, location, or even proximity to popular recreation sites can make a parcel very attractive for building a commercial lodge or camp. Other sites, especially those near roads or villages, may have a higher potential for commercial or residential development. Some may have the potential for commercial resource extraction due to the abundance of a quality commercial resource. The ease and economic feasibility of transporting equipment, products, and labor to and from the extraction site also affects development potential.

Certain land uses on private property can affect important resources on adjacent refuge lands.

A wide variety of land use practices can affect wildlife and habitats. Direct effects such as destruction of nesting habitat may be easily identified and measured. Indirect effects, such as habitat fragmentation or human disturbance in key habitat areas, may be much more difficult to quantify. Certain uses on private lands may affect important resources found on adjacent or even distant refuge lands. For example, commercial or industrial development along a river which flows into a refuge can impact downstream lands. Spilled fuel, oil, or chemicals can be easily transported into the refuge, contaminating water and habitats far from the source.

Development on private lands can have more subtle, indirect impacts on refuge resources as well. Lodges, camps, or other commercial facilities often use adjacent refuge land for recreational activities, including hunting, fishing, or wildlife viewing. In most

cases, these types of uses are compatible with refuge purposes and are encouraged. However, there is the potential for refuge impacts if these facilities or activities occur within sensitive wildlife habitats or near populations vulnerable to human disturbance.

The potential threat posed by a specific type of land use or development may vary substantially depending on where the parcel is located. Land uses that could seriously impact lands supporting key wildlife habitats may be of only minor concern in a less sensitive area. For instance, a commercial lodge operating on a remote lake critical to nesting tundra swans might be a concern, while a similar operation on a lake used by less sensitive species might not.

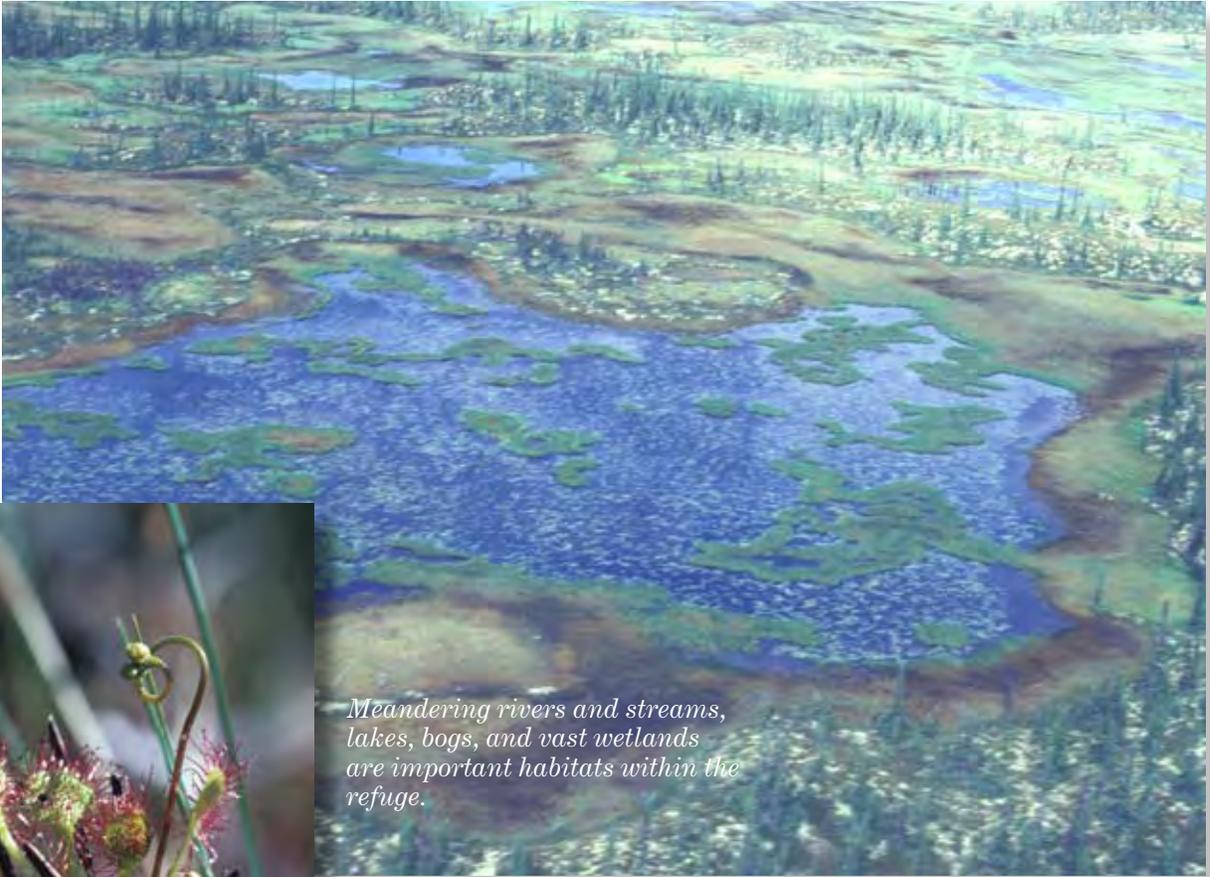
The potential threats to refuge wildlife populations and their habitats, and our ability to minimize them, are important considerations in developing a Land Protection Plan. Parcels with exceptional wildlife values may not be a high priority for protection if it is likely the land will always be used in wildlife-compatible ways. Conversely, the imminent risk of incompatible land use practices could elevate a lower ranking parcel to higher priority. Both the resource value of the land and the potential opportunity for reducing impacts to refuge resources influence our priorities.

Land acquisition opportunities will be considered on a case-by-case basis.

Red-necked grebes are among the many species of waterbirds that nest and rear young on the refuge. They nest in lakes and ponds, laying four to five eggs on floating mats of dead grass, sedges, and rushes.



U.S. Fish & Wildlife Service



U.S. Fish & Wildlife Service

Meandering rivers and streams, lakes, bogs, and vast wetlands are important habitats within the refuge.



U.S. Fish & Wildlife Service

Sundews are carnivorous wetland plants that trap and digest insects on their sticky hairlike tentacles. The name refers to the glistening drops of mucilage that resemble morning dew.



Sidney Charbonnet





Effects of Resource Conservation Measures

Refuge management actions may affect people and other refuge resources as well as fish and wildlife. In this chapter, we briefly address potential effects of land protection measures on the human environment, including cultural resources and the local economy.

Effects on Cultural/Historical Resources

The Athabaskan people traditionally lived in an expansive area of interior Alaska including the Innoko and Iditarod River drainages. Native villages, now abandoned, include Dishkakak, Dementi, Holikachuk, and Old Shageluk.

The discovery of gold in the early 1900s brought prospectors and white settlements to the area. Following traditional travel routes, an overland winter supply trail brought mail and supplies to the supply towns that sprang up in response to the influx of miners. This winter trail, known as the Iditarod Trail, is now a designated National Historical Trail.

There are 77 historic sites listed in the Alaska Heritage Resources Survey (AHRs) database for this region (Corbett 1995). The list includes historic buildings (roadhouses and cabins), abandoned settlements, mines, trails and cemeteries. There are 40 known cultural resource sites within the southern unit of the Innoko Refuge (Corbett, pers. comm. 2006). Nineteen of these are historic sites associated with the Iditarod National Historic Trail; ten are trail segments; two are prehistoric and the remainder are prehistoric with historic components. Thirteen of the sites in the refuge are not listed in the AHRs database because their exact locations are unknown.

Relatively little archaeological work has been done on the Innoko Refuge and additional sites probably exist. The available information was collected in response to specific legal requirements and is proportional to survey effort. Systematic surveys and oral history collection might identify more historic and culturally important locations.

The Service is committed to protecting cultural resources on refuge lands and willing to assist private landowners in protecting resources on their lands. The assistance may take the form of advice, jointly prepared preservation plans, or technical assistance.

If the Service acquires properties containing cultural resources, they are protected under Section 106 of the National Historic Preservation Act of 1966. The Act requires Federal agencies to consider the effects of agency actions on cultural properties. The sites are also protected under the Archaeological Resources Protection Act which requires permits for research and provides criminal and civil penalties for looting or vandalism of sites.

The Service will protect cultural resources on acquired lands.

Effects on Landowners

There are no communities within the boundaries of the Innoko Refuge, but the village corporations of Grayling and Shageluk and the regional corporation, Doyon Limited, own lands within the boundaries. The villages of Anvik and Shageluk are located within 15 miles of the refuge boundary and the villages of Takotna and Holy Cross within about 40 miles. The refuge headquarters is located in the local transportation hub of McGrath.

Implementing this plan will have minimal effects on most local residents.

The private lands within the Innoko Refuge are largely undeveloped and owned by Native corporations or by Native allottees who use the land for subsistence purposes. Most of these landowners will not be effected by this Land Protection Plan. However, some landowners interested in selling could receive a cash payment for their land. In Alaska, we must offer to exchange lands prior to purchasing lands outright (Public Law 105-277, Section 127). Therefore, if the landowner is interested only in selling, he or she must indicate that the exchange offer was refused before the purchase can proceed.

Some landowners may wish to exchange their lands for others with greater development potential.

In some cases, landowners may be interested in exchanging their land for Service-owned uplands more suitable for development. For example, privately-owned wetlands with high wildlife value might be exchanged for Service land in more desirable building locations, or for Service-owned subsurface (sand, gravel, rock, etc.) beneath private lands. In some cases, land exchanges can help consolidate both public and private holdings. However, the Service will consider land exchanges only if they will benefit the refuge as well as the private landowner.

The Land Protection Plan could benefit large landowners by providing opportunities to improve management of both private and public resources through cooperative management agreements or conservation easements.

Any land the Service acquires will be preserved in its present state, or restored to former natural conditions, and managed in the same manner as the surrounding or nearby refuge lands. All acquired lands are available for subsistence and recreational uses.

Effects on the Economy

The communities near the Innoko Refuge support a mixed subsistence / cash economy. Local residents rely heavily on hunting, fishing, trapping, gathering and gardening to obtain food and materials for their own consumption. Salmon, moose, black bear, small game and waterfowl are important resources. Employment is primarily seasonal work. In 2004, nine of the 182 residents of Grayling and one of Shageluk's 129 residents held commercial fishing permits.

A mixed subsistence/cash economy predominates in nearby communities.

Subsistence fishing is an important source of food for area residents. However, the abundance of salmon stocks is cyclical and periodic declines have occasionally reduced opportunities for subsistence and commercial harvest. In 2001, there was no commercial harvest of summer chum salmon in the Yukon River. Since 2002, salmon runs have increased dramatically and the 2006 summer chum run was the second largest on record (Clark et al. 2006). The commercial fishery has resumed, however, market demand has been low.

Tourism and the demand for visitor services is likely to increase over time.

Currently, recreational use of the refuge by people living outside the local area is low, but these lands and waters provide excellent opportunities for sport fishing and hunting. Pike fishermen visit during the summer months and moose hunters during the fall. As these hunting and fishing areas become better known, the demand for visitor services is expected to increase. The Service gives preference to local residents and to those Native corporations most affected by the establishment of the refuge (ANILCA § 1307(b)), when contracting for the provision of visitor services. Visitor services include any service available for a fee, such as providing food, accommodations, transportation, tours, and guides, with the exception of guided hunting and fishing (ANILCA § 1307(c)). In addition, Native lands are given priority consideration in the siting of refuge administration sites and visitor facilities. Native lands may be leased, or acquired by purchase or exchange.

Land protection measures may have a positive effect on these industries. Land conservation measures within the refuge boundaries may prove beneficial by helping to protect the watersheds and drainages that serve as spawning and rearing areas for anadromous species. Conservation of habitat and resources through public stewardship will benefit recreational and subsistence uses. Managing the resource to provide habitat for wildlife and fish will ensure that hunting, fishing and other recreational and subsistence opportunities continue.

The local economy may benefit if an active land acquisition or exchange program develops in the future. Some landowners could receive a cash payment for their land, or for an interest in their land (such as a conservation easement). The local economy receives direct benefits from the refuges through the Refuge Revenue Sharing Act. Designed to assist communities located near refuges, the Act authorizes annual payments to the local government for any inholdings acquired by a refuge. If local communities are not yet organized into a regional government with taxing authority, the payments authorized under this act are paid to the State.

Land protection measures help ensure healthy watersheds and populations.

Effects on Public Access

Access is a component of public use that can be affected by land ownership. In Alaska, most refuge lands are open to public access. Most non-local visitors access the refuge via air taxi or private plane, while local residents rely on the full range of access modes identified under ANILCA Section 1110. Access can be regulated if needed to protect refuge resources. In some cases, specific types of access may be prohibited, but only after public hearings and a determination that the use is detrimental to area resources.

Section 17(b) of ANCSA provides public access across Native corporation lands. This section provides for public use easements across lands and at periodic points along major waterways within Native conveyed lands. There are currently three easements within the refuge boundaries, including two one-acre site easements and one trail easement. Unfortunately, recreationists often have difficulty determining whether they are on public or private land, especially in areas of checkerboard ownership. The result is a tendency to use private lands as though they are part of the refuge.

Any new land acquired by the refuge will be managed in the same

In Alaska, most refuge lands are open to public access.

manner as the surrounding refuge lands. Traditional public access to the acquired property will generally be maintained. The refuge may impose some regulations on public use to protect resources, but in the long-term, private landowners are more likely to restrict public access or require user fees. All commercial ventures occurring on the acquired lands, including guided fishing and hunting, would be subject to the same special use permit restrictions required on adjacent refuge land.

Effects on Subsistence

In general, traditional public access is maintained on lands acquired by a refuge.

Subsistence is a primary purpose of this refuge. Furthermore, Title VIII of ANILCA established in law special protection for subsistence activities on most Federal lands in Alaska. Rural residents receive a priority to harvest wildlife for subsistence purposes on all refuge lands where the Federal Subsistence Board has determined that there is a customary and traditional use of a particular wildlife population or fish stock. The subsistence harvest may be restricted if wildlife population numbers fall to dangerously low levels. However, the subsistence harvest is resumed when populations recover to healthy levels.

A subsistence priority for rural residents is ensured on acquired lands.

Unlike land purchases in the private sector, land acquisition by the Service ensures a subsistence priority for rural residents on the acquired lands. For further information, see the Subsistence Management Regulations for Federal Public Lands in Alaska (USFWS 2006).

Salmon drying in the sun on the banks of the Yukon River.



Polly Wheeler





Evaluating Land Conservation Proposals

When a landowner or the Service proposes resource protection measures, each proposal is evaluated individually. In most cases, land conservation decisions on the Innoko Refuge will be based on the following guidelines:

Many factors influence our land protection priorities.

Emerging development pressures or management concerns may cause priorities to change over time.

A parcel surrounded by private land is generally unsuitable for acquisition.

In general, isolated parcels with high biological value warrant land protection.

We consider the ecology of the entire area.

1. Relative rank in the GIS model

- Our GIS model divides the total acreage of non-Federal lands within the refuge boundary into three priority categories according to relative resource values.
- High priority to medium priority lands have sufficient resource values for the Service to consider acquiring an interest in the land.
- Typically, higher ranked lands are acquired before lower ranked lands.
- Some low priority lands may have noteworthy resources that warrant protection.

2. Special management values

- Protecting or acquiring certain non-Federal lands could help the refuge meet specific management goals and objectives.
- Special management values include consolidating refuge ownership or improving management of public access.

3. Development potential and its effect on refuge resources

- While some types of development may increase the opportunities for public use and enjoyment of the refuges, others may seriously impact refuge wildlife, habitats, or other resources. The threat of incompatible development adds urgency to the need for protection.

4. Effect of land conservation measures on overall refuge management

- Land conservation measures should simplify, not complicate, refuge management.
- We seldom acquire tracts of land embedded in larger blocks of private property.

5. Effect of land conservation measures on biological integrity, diversity, and the environmental health of the refuge

- Land conservation strategies should preserve or increase biological diversity, integrity and environmental health.
- To protect key habitats or geographic areas, we may consider adopting similar land protection measures across all lands in the area of interest, regardless of their ranking in our GIS model.

Our GIS model provides a relative ranking, so some low-scoring parcels may have noteworthy resource values that warrant protection.

All our land protection methods require the cooperation of the landowner. We will take action only if the landowner is interested.

Funding shortfalls may limit our ability to take action.

The Service does not prioritize subsurface interests.

Sunset on the Innoko Refuge.

- We are interested in strategies that allow us to work cooperatively with landowners to protect the ecosystem now and in the future.

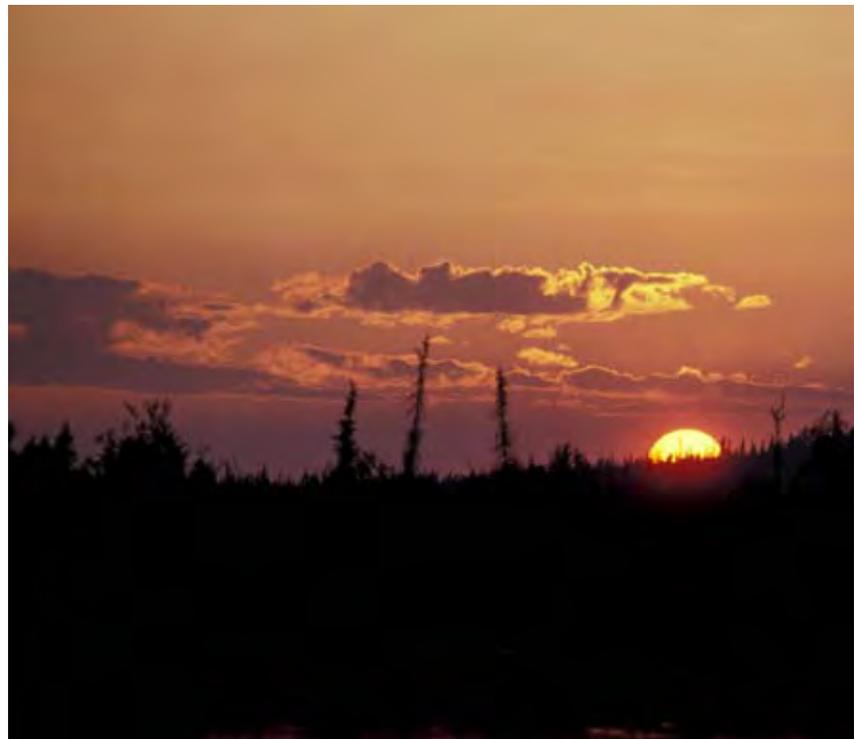
6. Landowner's willingness to work with us to protect natural resources on their land

- We acquire land or interests in lands only from willing sellers.
- Interest in land can be obtained by lease, easement, exchange, donation, or fee title purchase.
- Cooperative agreements with landowners may adequately protect resources if acquisition is not necessary, or if the landowner is willing to consider resource protections other than selling specific land interests.

7. The availability of funds for land acquisition or other protection measures

- Funds are not always available for land protection measures.
- Each refuge must compete nationally with other national wildlife refuges for acquisition funding.

Subsurface interests are not evaluated in this land protection plan. In Alaska, the Service rarely acquires subsurface interests because: 1) surface use is already regulated if the surface is refuge land; and 2) the vast amount of privately-owned surface land must receive primary consideration. We generally acquire subsurface interests only through special mandates in response to legislative action.



U.S. Fish & Wildlife Service





Public Involvement

Wildlife conservation is the driving mission behind the National Wildlife Refuge System, but people are part of the equation. ANILCA states that one purpose for designating Conservation System Units in Alaska, including National Wildlife Refuges is to:

“...preserve for the benefit, use, education and inspiration of present and future generations certain lands and waters in the State of Alaska that contain nationally significant natural, scenic, historic, archeological, geological, scientific, wilderness, cultural, recreational, and wildlife values...”

We encourage landowners, and other interested public, to be involved in the land conservation planning process.

Refuge lands represent many things to many people. Alaska refuges have an allure that can capture the hearts and minds of people in distant locales. Many people care about refuge lands even though they may never experience them firsthand. Refuge lands have a different significance for those who live, work, and play within refuge borders. Generations of Alaska Natives have depended on the cyclical flow of the seasons to provide food, shelter, and a link to their cultural past.

Since land protection measures can influence wildlife resources and the management of wildlife refuges, we want to involve the public in the planning process. Input from interested individuals helps us tailor land protection plans to meet the needs of landowners, wildlife, the Service, and the public. We encourage landowners and interested members of the public to learn more about these refuges and help us identify important land conservation and management issues.

The planning process began with statewide public meetings in Anchorage and Fairbanks during October 1990 to announce the beginning of the land protection planning process for all refuges in Alaska.

The Service contacted the public as part of the planning process.

In early 2007, refuge staff met with representatives from McGrath, Takotna, Holy Cross, Anvik, Grayling, Shageluk, and Kaltag to brief them on this plan as well as the Comprehensive Conservation Plan revision. Participants were told that we would willingly schedule additional meetings at the request of interested individuals or groups.

Land Protection Plan Revision

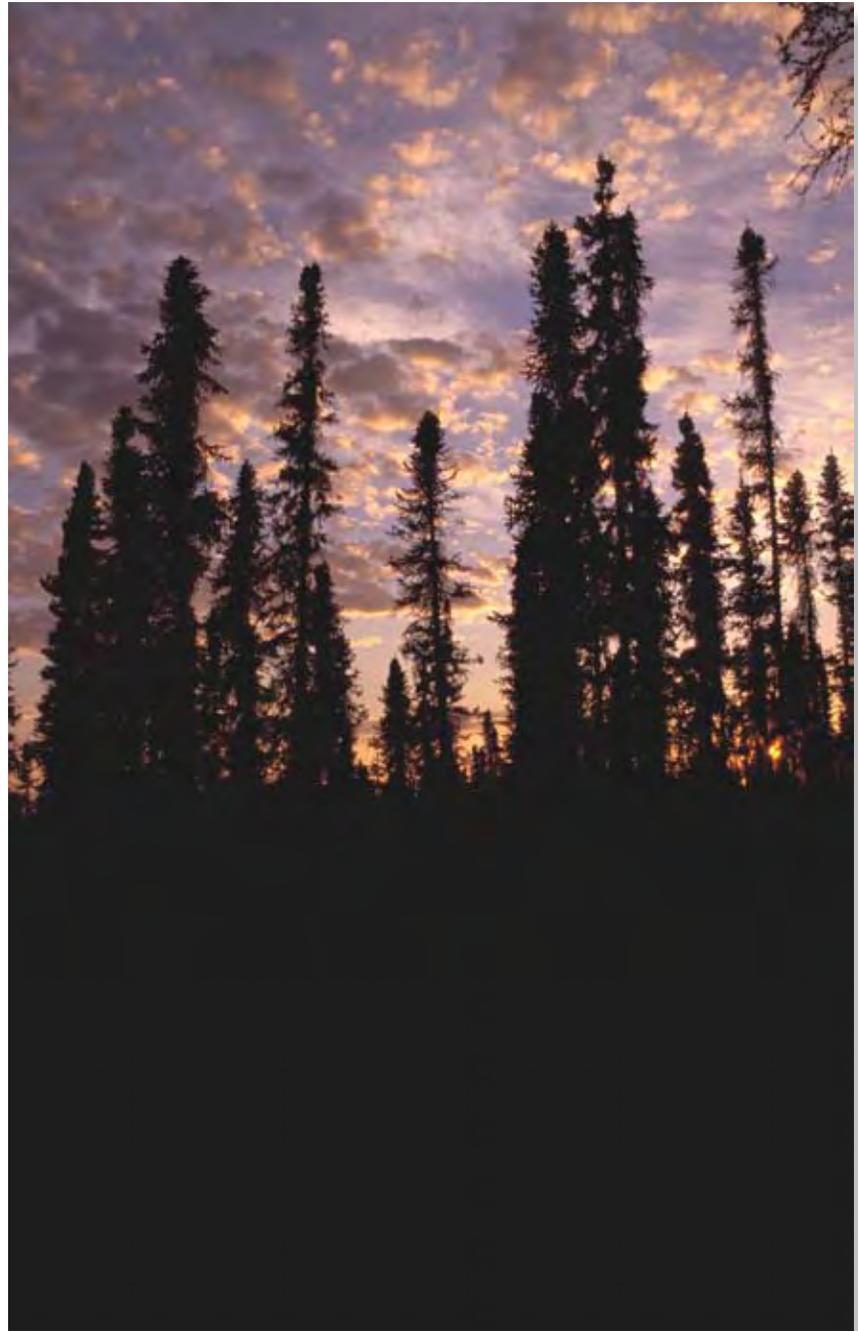
Land ownership on the Innoko Refuge will change as land is conveyed, relinquished, subdivided, or sold. We maintain a computerized database of land ownerships and a list of owners who express an interest in land conservation opportunities. The following page contains a form that landowners can use to express

Land protection planning is an ongoing process.

If you have any questions or would like to request a meeting, please contact the Innoko Refuge.

interest in working with us. Just fill in the form, tear it out, fold it, and mail it to the address preprinted on the back.

We will periodically review the Innoko Land Protection Plan. If land ownership or land uses change enough to alter our land protection priorities, we will consider revising the plan. Whenever we propose significant revisions, we will notify landowners and the public.



Anna Ramsburg



Landowners: Would you like to work with us to protect wildlife on your land?

Refuge Planning Participants: Would you like to receive future mailings concerning the Innoko Refuge Land Protection Plan?

Please use this form to express your interest in the refuge Land Protection Plan. The information you provide here will be used primarily for planning purposes, and does not constitute an offer to buy land.

Name: _____

Address: _____

Telephone: _____

Please check this box if you would like your name added to the Innoko Land Protection Plan mailing list.

There are 6 basic options that have been identified in the Plan. Please check the options in which you have interest.

No Action (I am not interested in participating)

Cooperative Agreement (An agreement between a landowner and the Service to help each other manage land. No money is involved.)

Conservation Easement (Landowner keeps title to land but sells development rights to the Service).

Exchange land for other Federal land

Sell land to the Fish and Wildlife Service

Donate land to the Fish and Wildlife Service

Legal Description of my parcel or allotment (on the Deed or other official correspondence):

T____N R____E Section _____ Lot _____
Kateel River Meridian

Comments: _____

If you have any questions, please contact:

Refuge Manager
Innoko National Wildlife Refuge
P.O. Box 69
McGrath, Alaska 99627
(907) 524-3251

U.S. Fish and Wildlife Service
Division of Conservation, Planning & Policy
1011 E. Tudor Road
Anchorage, AK 99503
(907) 786-3357

Please fold form and mail to address on other side.

Fold Here

From: _____

Place
Stamp
Here

To: U.S. Fish & Wildlife Service
Division of Conservation, Planning & Policy
Mail Stop 231
1011 East Tudor Road
Anchorage, Alaska 99503-6119



Sources of Information

- Alaska Department of Fish and Game (ADFG). 2001. Furbearer management report of survey-inventory activities, 1 July 1997-30 June 2000. C. Healy, editor. Division of Wildlife Conservation. Project 7.0. Juneau, Alaska.
- Alaska Department of Fish and Game (ADFG). 2003a. Wolf management report of survey-inventory activities, 1 July 1999-30 June 2002. C. Healy, editor. Division of Wildlife Conservation, Juneau, Alaska.
- Alaska Department of Fish and Game (ADFG). 2003b. Caribou management report of survey-inventory activities, 1 July 2000-30 June 2002. C. Healy, editor. Division of Wildlife Conservation, Juneau, Alaska.
- Clark, Kevin J., D Bergstrom, D. Evenson. 2006. Yukon River summer chum salmon stock status, 2006; a report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Divisions of Sport Fish and Commercial Fisheries. Special Publication No. 06-34. Anchorage, Alaska.
- Conant, Bruce. 1999. Waterfowl estimates from annual Alaska-Yukon Waterfowl Breeding Population surveys, 1977-1998. Unpublished data, U.S. Fish and Wildlife Service, Waterfowl Management, Juneau, Alaska.
- Corbett, Debra. 2007. Personal communication. Regional Archeologist, U.S. Fish and Wildlife Service, Anchorage, Alaska.
- Corbett, D. and M. Arend. 1995. Innoko National Wildlife Refuge guide for managing cultural resources. Unpublished report. U.S. Fish and Wildlife Service, Anchorage, Alaska.
- Dashevsky, Samuel, D. Clark, D. Wilt, D. Sherrer. 2002 gold and platinum mining at Boob Creek, Tolstoi Mining District, Southwestern Alaska. Abstracts of the Alaska Miners Association 2002 Annual Convention.
- Hinzman, L. D., N. D. Bettez, W. R. Bolton, and F. S. Chapman. 2005. Evidence and implications of recent climate change in northern Alaska and other arctic regions. *Climate Change* 72: 251-298.
- Michel, Henry (Ed.). 1967. Lieutenant Zagoskin's travels in Russian America 1842-1844. Toronto: University of Toronto Press.
- Mueller, K. A., and A.C. Matz. 2002. Water quality, and metal and metalloid concentrations in water, sediment, and fish tissues from Innoko National Wildlife Refuge, Alaska, 1995-1997. U.S. Fish and Wildlife Service, Northern Alaska Ecological Services, Technical Report NAES-TR-02-01. 155 pp.
- Riordan, B., D. Verbyla, A. D. McGuire. 2006. Shrinking ponds in subarctic Alaska based on 1950-2002 remotely sensed images. *Journal of Geophysical Research*, vol. 111.

- Skinner, Robert. 2002. Personal communication. Biologist, Innoko National Wildlife Refuge.
- U.S. Fish and Wildlife Service (USFWS). 1988. Acquisition of inholdings in Alaska National Wildlife Refuges: Draft Legislative Environmental Impact Statement. U.S. Department of the Interior, Anchorage, Alaska.
- U.S. Fish and Wildlife Service (USFWS). 1987. Innoko National Wildlife Refuge: final comprehensive conservation plan, environmental impact statement, Wilderness review. U.S. Department of the Interior, Anchorage, Alaska. 255 pp.
- U.S. Fish and Wildlife Service (USFWS). 1990. Alaska submerged lands report: analysis of inholdings, acquisition priorities and recommendations to reduce impacts on Conservation System Units in Alaska. U.S. Fish and Wildlife Service. Anchorage, Alaska. 183 pp.
- U.S. Fish and Wildlife Service (USFWS). 1995. The Alaska Priority System. Unpublished report (draft). U.S. Fish and Wildlife Service, Division of Realty, Anchorage, Alaska. 46 pp.
- U.S. Fish and Wildlife Service (USFWS). 2006. Subsistence management regulations for federal public lands in Alaska. U.S. Fish and Wildlife Service, Anchorage, Alaska.
- U.S. Geological Survey (USGS). 2002. Wood frog, *Rana sylvatica*. Northern Prairie Wildlife Research Center. URL: <http://www.npwrc.usgs.gov/narcam>



Appendix I: Priority Analysis

The Alaska Priority System (APS) model was developed to set State-wide priorities for all refuge inholdings. In other words, the private lands in each refuge in Alaska were compared with all the other private lands in each of the 16 National Wildlife Refuges in Alaska to come up with a prioritized ranking of inholdings. To set priorities for the Innoko Refuge, we modified the APS model to make it specific to the Innoko Refuge. For example, we eliminated from the model certain species that do not occur in the Innoko Refuge. The following is a brief discussion of the APS model and how it was modified for use in the Innoko Land Protection Plan process.

APS Model

The APS model uses seven resource and two management criteria to rank land and resources. The seven resource criteria are: endangered species, migratory birds, diversity of wetlands, diversity of uplands, marine mammals, resident refuge purpose species, and fisheries. The two management criteria are public use and refuge management — the capacity of acquisition to enhance management of refuge lands.

Point values are assigned to each category (species) in the model based on the densities, distribution, and/or diversity of specific wildlife populations. Overlaying each of these layers, and adding their associated point scores, produces a “priority map.” Areas with the highest scores are those areas that are most important to the most species. Overlaying this priority map with the land status layer helps us evaluate which private lands have the highest biological value. The APS process is discussed in more detail in “The Alaska Priority System” (USFWS 1995).

The Ranking Process for the Innoko Refuge

The ranking process began with the gathering and mapping of fish and wildlife data and management information. Refuge and Regional Office staff worked together to identify the fish and wildlife species, habitats, and management issues most important in terms of refuge purposes. We acquired the best available information for our analysis of species distribution and abundances. Sources of information ranged from hand-drawn distribution/relative abundance maps, based on the professional judgement of the refuge staff, to detailed survey data.

We used a variety of processes to translate this information into digital ArcGIS (software by Environmental Systems Research Institute 2006) maps. Hand-drawn maps were digitized using ArcMap GIS software. We assigned relative density or relative habitat quality values to the resulting vector maps. Survey data

(such as aerial waterfowl surveys conducted by the Migratory Bird Office) were converted directly from data tables (GPS coordinates) into point maps. We used the ArcGIS tool, Spatial Analyst, to create density maps from those data sets containing species counts or population data.

In the Innoko APS model, we created a total of 25 different maps or layers. Of these, 23 maps displayed distribution and relative abundance of important species and two showed special management areas (fire management and Wilderness management). The mapped species layers included birds (American wigeon, American green-winged teal, scaup, northern pintail, mallard, ring-necked duck, greater white-front goose, Canada goose, sandhill crane, swans, peregrine falcon, and bald eagle/osprey), mammals (grizzly bear, black bear, caribou, moose, wolf, marten, lynx, beaver, and wolverine), and fish (salmon) and one species group (waterbirds).

To facilitate analysis, we converted all vector data to a raster format. Each species layer (data layer) had the same potential minimum and maximum scores. In this case, the maximum possible score was 7 and the minimum possible score was 0 (no-use). For example, in the mallard duck layer (map), those areas of the refuge not used by mallards were coded 0; areas heavily used by mallards were coded “7.”

We used Spatial Analyst to sum the scores for all 25 layers and overlaid these with the land status map. The result is a “priority map” — each private parcel has an associated point score. Higher scores indicate use by a higher number of species and/or higher densities. We classified these scores into three categories (high, medium, and low priority).

