

Kenai National Wildlife Refuge
Soldotna, Alaska



ANNUAL NARRATIVE REPORT
Calendar Year 1986



U. S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

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KENAI NATIONAL WILDLIFE REFUGE

Soldotna, Alaska

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U.S. Fish & Wildlife Service

1011 E. Tudor Road

Anchorage, Alaska



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NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

KENAI NATIONAL WILDLIFE REFUGE

Soldotna, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1986

Daniel W. Dostier 5/7/87
Refuge Manager Date

Paul R. Schmidt 6/8/87
Refuge Supervisor Review Date

[Signature]
Regional Office Approval

6/15/87
Date

US FISH & WILDLIFE SERVICE--ALASKA



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INTRODUCTION

The Kenai National Wildlife Refuge is situated on the Kenai Peninsula in southcentral Alaska. The northern portion of the refuge is only 20 air miles from the State's largest population center, the City of Anchorage. Although a scenic 112 mile drive through the Kenai Mountains is necessary to reach the wildlife refuge via road, commercial commuter aircraft fly into Kenai and Soldotna daily from Alaska's largest city, 60 air miles north.

Located within the center of the Kenai Peninsula and extending 115 miles from Turnagain Arm on the north to nearly the Gulf of Alaska on the south, this refuge encompasses about one-third of the Peninsula. The western portions of the Kenai Mountains generally form the eastern refuge boundary, a common boundary shared with our Chugach National Forest and Kenai Fjords National Park neighbors.

Since the establishment of the refuge on December 16, 1941, under E.O. 8979, these lands have undergone at least two boundary changes and a name change. The original refuge included 2,058,000 acres and, among other mandates, authorized settlement, location, and other disposition under public land laws applicable to Alaska. At that time, the refuge was bounded on the northwest, from Point Possession to the Kasilof River, by the waters of Cook Inlet. A six mile wide strip of land from Boulder Point to the Kasilof River and a six mile strip of land, including portions of the Kenai River, were open for development. Homesteads, grazing areas, road systems, and other developments occurred in these areas which were eventually excluded from the refuge during a 1964 boundary adjustment. Also excluded, were Cook Inlet coastal lands one to three miles inland and considerable portions of the Harding Ice Field, reducing the refuge area to 1.73 million acres.

Passage of the Alaska National Interest Lands Conservation Act (ANILCA) December 2, 1980, not only changed the Kenai National Moose Range to Kenai National Wildlife Refuge but further increased the refuge acreage to 1.97 million, with the addition of mostly mountainous regions, an area of approximately 150,000 acres on the extreme south and about 90,000 acres of formerly adjacent Forest Service lands to the extreme northeast near the Chickaloon Flats. At the same time, the passage of ANILCA, commonly known as "The Alaska Lands Act," withdrew from the refuge 16,535 acres to satisfy the claims of the Salamatof Native Association under the Alaska Native Claims Settlement Act (ANCSA). The now-1.953 million acre refuge has been reestablished and is managed to: 1) conserve fish and wildlife populations and habitats in their natural diversity, 2) fulfill international treaty obligations with respect to fish and wildlife, 3) insure water quality and quantity, 4) provide opportunities for scientific research, interpretation, and environmental education, and 5) to provide opportunities for fish and wildlife-oriented recreation. In addition to establishing new boundaries, new purposes, and a new name, 1.35 million acres of the refuge were formally designated as wilderness.

The refuge is divided into two generalized physiographic types, a mountainous region and a forested lowland. Elevations on the refuge range from 150 feet in the lowlands to over 6000 feet in the Kenai Mountains. Treeline is at 1800 feet and among the peaks lie the Harding Ice Field which thrusts numerous glacial fingers out from the mountains. The glaciers, mountains, lakes, alpine tundra and receding foothills are extremely scenic.

The vegetation of the refuge may be subdivided into three major classes: 1) humid coastal forests dominated by Sitka spruce (Picea sitchensis); 2) interior forests of white and black spruce (Picea glauca, P. mariana) with a mixture of birch (Betula papyrifera); and 3) mountain tundra, including glaciers and snowfields.

Forests cover 39% of the refuge. Swampy forests of black spruce alternate with peatbogs and grassy mires while white spruce forests are distributed in the drier areas and in the foothills and mountains. They are often intermixed with or include, deciduous trees such as white birch, especially in old burns and cut-over areas. Aspen (Populus tremuloides) is also found with white spruce and birch. Lowland shrub (alder and willow) covers 9% of the refuge.

Mountain tundra covers about 11% of the refuge. Of this class, about 87% is dwarf shrub and lichen tundra and 13% is tall shrub (alder and willow) thickets usually associated with tundra.

Water and associated wetlands cover 13% and snow, ice and glaciers cover the remainder of the refuge.

The Kenai River, the largest river system on the peninsula drains about 2,148 square miles (5,563 km²). About 54% of the watershed is on the refuge, 37% in the Chugach National Forest, and the remainder on private lands. Ten major tributaries feed the Kenai River System: Beaver Creek, Slikok River, Soldotna Creek, Funny River, Moose River, Killey River, Skilak River, Russian River, Cooper Creek, and Juneau Creek.

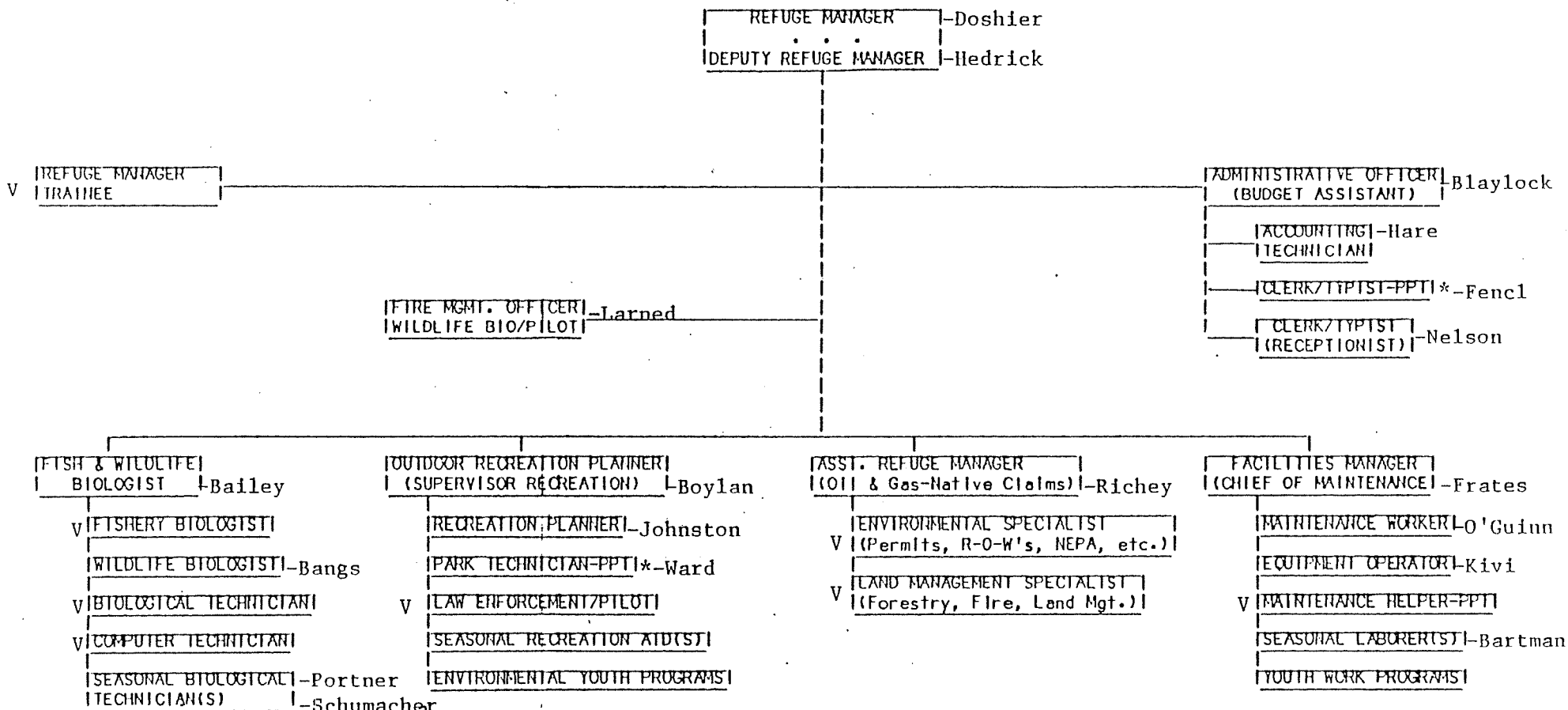
Other refuge river and stream systems flowing westward into the Cook Inlet include Kasilof River (which drains Tustumena Lake), Deep Creek, and the Swanson, Fox, Ninilchik, and Chickaloon rivers.

There are thousands of lakes on the Kenai Peninsula. Nearly all of them are on the refuge. The largest are two glacial lakes, Tustumena Lake (72,000 acres or 30,000 ha), and Skilak Lake (25,000 acres or 10,000 ha). More than 4,500 smaller lakes dot the refuge mostly in the Moose, Swanson, and Chickaloon River drainages.

At least 199 species of amphibians, birds, and mammals use the wildlife habitats on the refuge. None of these species are known to be threatened or endangered. Significant populations of brown and black bear, sheep, goat, wolves, bald eagles, trumpeter swans, caribou, moose, loons, four species of salmon and a wide variety of furbearers occur on the refuge.

KENAI NWR staff as of December 31, 1986.

KENAI NATIONAL WILDLIFE REFUGE
ORGANIZATION CHART
May 10, 1984



APPROVED BY:

Refuge Manager

Date

Asst. Regional Director (AWR)

Date

V=Vacant

*=Converted PPT

Refuge Supervisor South (RF)

Regional Director

Date

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A. HIGHLIGHTS

Another cool summer and mild winter.

Augustine volcano gives the Kenai a coating of ash.

For the second time since 1964, there was not enough snow to allow snowmobiles to operate.

FWS appeals the 4,000+ acres selected by Point Possession, Inc. within the refuge.

Regulations implementing the Kenai Comprehensive Conservation Plan became effective half way through the moose season.

Congressman Young reminds the staff who they are really "supposed" to manage for.

Fifty two more caribou were released.

Refuge marten study initiated.

Dee Nelson brings the administrative staff back to "full force".

RM Delaney leaves and RM Doshier arrives.

Twenty eight volunteers contribute 8,400 hours.

Over 1,000 acres of second growth forest was manipulated to improve moose winter range.

Refuge inholders receive special ORV access to wilderness.

Thirteen new eagle nests found on the refuge.

Refuge snowshoe hare population continues to "crash"

Congressional add-on of \$1.3 million received for Skilak Loop.

Visitation for interpretive film series increases 23% to 6,850 inquiring minds.

Black bear "baiting" becomes more popular on the refuge.

Wolf trapping in a portion of the refuge closed by emergency order.

The refuge's Alaska Natural History Association sales outlet saw a 27% increase in volume.

The Russian River parking area was handled by a concession contract.

Minor gas "blow out" at the Swanson River field.

B. CLIMATIC CONDITIONS

Following the previous year's marathon of records and near records, we began this year just about where we had left off (Table 1). January, with mild temperatures averaging 13.7 reached a high of 37°. An average snow depth of only one to three inches for the lowlands frustrated winter sports aficionados. February continued with temperatures in the high 30°s and low 40°s leaving Tustumena and Skilak Lakes unfrozen while most smaller lakes supported several inches of water over ice covered surfaces. Some snowfall and dipping temperatures to -17° arrived late in the month and on March 1, the winters lowest recorded dip at -20° was logged in Kenai. Unpredictable March also lived up to its reputation as an intense low pressure system from the Gulf of Alaska resulted in the month's high of 44° and 5-6 inches of heavy wet snow.

Table 1. Monthly temperatures and precipitation data*.

Month	Temperature				Precipitation	
	'85 High	'86	'85 Low	'86	Total	Snow
January	40°	37°	15°	3°	.64"	3.0"
February	36°	43°	-20°	-17°	.48"	1.7"
March	34°	44°	0°	-20°	2.70"	2.5"
April	46°	53°	-15°	0°	.15"	1.7"
May	65°	66°	25°	25°	1.07"	trace
June	77°	73°	29°	32°	trace	0.0
July	76°	71°	39°	35°	2.19"	0.0
August	68°	68°	32°	35°	3.63"	0.0
September	62°	61°	24°	21°	2.66"	0.0
October	50°	53°	12°	9°	7.37"	trace
November	37°	48°	-21°	-13°	1.99"	7.1"
December	44°	43°	-3°	-2°	1.05"	6.0"
Total for 1986 (1985)					(14.60) 23.92"	(41.4) 22.0"
39-Year Average Total					20.01"	68.0"

*Reported by FAA at Kenai Airport

March refused to go out like a lamb as Augustine Volcano, approximately 120 air miles southwest of refuge headquarters, ended a 10-year slumber erupting during the early morning hours of March 27. The entire Kenai-Soldotna area awoke that Thursday morning to a rather generous dusting of ash and distinct smell of sulfur as southerly winds carried the ash plume northward over much of the Kenai Peninsula-Cook Inlet Region. Frequent eruptions combined with persistent southerly winds brought additional ash slowing regional air traffic to a virtual

standstill. As wind blown ash created an eerie yellowish-brown cast to the landscape, it again reminding us of the fact that the earth's rebellious nature, at least in Alaska, has a strong affinity for misbehaving on Good Friday remembering the 8.5 Earthquake of 1964.



Augustine volcano erupted March 27, and continued sporadic eruptions throughout the summer diverting flights around the island. On August 22, observed ten miles west, ash and debris rose more than 8,000 feet high to be carried toward the Barren Islands and the town of Homer.

RR.



Ash from Augustine volcano on FM Frates' personal vehicle. Jim reports that "ash writing" on your vehicle is not recommended as he now has a permanent "TATTOO" etched on the hood of his car. JF



"Fallout" from the eruption of Augustine volcano accelerated snow melt and generally made a mess of things for a few days. JF

Although temperatures in the 50°s did prevail in late April, all refuge lakes remained ice covered at month's end including Tustumena, Hidden and Skilak Lakes. Attesting to the low snowfall throughout the Kenai Peninsula, for the first time in at least twenty years the Swan Lake Road to the Moose Research Center did not require a snow plow. And for only the second time in refuge history, snowmobile use this season was unauthorized due to lack of adequate snowcover.

Headquarters Lake ice went out May 10, and refuge lake ice had all but disappeared by mid-May. The volcanic ash from eruptions at Augustine Island was an apparent contrast to remaining snowcover as ash deposits on some hillside locations was sufficient to easily observe even on the snowless tundra.

More than 3.5 inches of rain fell during August, making this month the sixth wettest since records have been kept. September and October also were soggy months but October brought some surprises with warmer and much wetter conditions, at more than five inches above normal! Nearly six inches fell on the 9th and 10th during the typhoon that brought almost 16 inches to the town of Seward and caused extensive river flooding, washouts, bridge collapses, and the destruction of many river-bank homes and cabins throughout the Cook Inlet and Susistna Basins.

Lowering temperatures finally froze Headquarters Lake October 24, about 10 days later than normal. Weather patterns for November fluctuated widely, resulting in a panorama of all four seasons from a balmy 50° to a low of -13° recorded November 27. These unusual fluctuations continued through December including heavy rains, gusty winds and temperatures ranging generally between 18° and 40°. Thanksgiving snows melted early in December once again providing us rainy, icy conditions, a brown Christmas and New Year's to begin 1987, just as we had begun this year.

C. LAND ACQUISITION

1. Fee Title

a. Alaska Native Claims Settlement Act (ANCSA) -

1) Kenai Native Association, Inc. (KNA) - KNA engaged a University of Wisconsin land study group to conduct an assessment value of those refuge lands conveyed (18,083 ac.) to the Association under Interim Conveyance (I.C.) document #306, dated March 1980. This study estimated the value of KNA lands, without the 22(g) ANCSA covenant, ie., "...such lands remain subject to the laws and regulations governing use and development of such Refuge"..., to be worth \$14,500,000. The study cost KNA \$62K.

The Alaska Army National Guard office in Kenai was contacted during November in regard to unauthorized track vehicle use within the Kenai Native Association's 22(g) ANCSA inholding north of Kenai, including such use on refuge and other adjacent private lands. Weekend maneuvers,

utilizing military tracked vehicles, were apparently conducted cross-country on private, state, and refuge lands. Following Army contacts with the refuge and KNA, utilization of these lands ceased.

Abandonment and final reclamation of the West Fork 1-B well location, within Kenai Native Association lands was completed this month. Seagull Energy E&P Ind., in presence of BLM and FWS personnel, engaged local contractors to complete well abandonment, remove the wellhead, cellar, and other surface support facilities, and drift over the entire disturbed area, using stockpiled topsoil and forest debris from 20 years past.

2) Salamatof Native Association, Inc. (SNA) - On December 27, we learned from Anchorage Realty, that Washington had approved the "Proposed Acquisition of Kenai River Non-Development Easement in Exchange for Gravel" document authorizing the FWS to proceed to completion this exchange.

SNA continued development of roads, boat ramps, and other surface facilities adjacent the Kenai River and Funny River Road within the Moose Range Meadows subdivision.

Under Section 1307, Alaska Native Claims Settlement Act (ANCSA), Cook Inlet Region, Inc. (CIRI), and in turn SNA, were provided the opportunity to operate the Russian River Campground facility as a concession but both indicated no interest.

3) Toyonek Native Corporation - Nothing to Report.

4) Point Possession, Inc. (PPI) - On April 29, 1985, the Bureau of Land Management (BLM), issued a decision on selection application number AA-11130, filed by PPI on December 18, 1975, under the Alaska Native Claims Settlement Act (ANCSA). BLM's decision approved for patent to PPI the surface estate of 4,481.32 acres selected by PPI and located in T. 11 N., R. 6 W., Seward Meridian within the Kenai NWR and Kenai Wilderness as designated by the Alaska National Interest Lands Conservation Act (ANILCA). That decision also stated that CIRI is entitled under § 14(h)(9) of ANCSA, as added by § 1406(d) of ANILCA, to select the subsurface estate of 4,480 acres from those areas designated for in lieu selection in paragraph I.B. (2) of the agreement known as "Terms and Condition for Land Consolidation and Management in Cook Inlet Area" (P.L. 94-204).

On May 30, 1985, FWS appealed the April 29, decision with BLM (IBLA No. 85-655), claiming the lands described in BLM's decision were not available for conveyance to PPI for several reasons. First, such lands were not formally withdrawn by the Secretary for selection and conveyance to PPI as a native group at the time the Secretary had the authority to do so and, therefore, such lands are not now subject to ANCSA and do not not satisfy the requirement of § 14(h) of ANCSA that they be "unreserved public lands." Second, PPI has no vested or valid existing rights in the

lands covered by its application and the Secretary's discretionary authority under §§ 14(h)(2) and (7) to convey refuge lands to native groups was rescinded by legislation adopted after ANCSA. Third, the conveyance to PPI is barred by BLM's regulations.

Although several proposals have been submitted and meetings attended by staff, no agreements have been reached on PPI's latest proposal or FWS' counter proposal. The latest proposal would provide PPI with 320 acres of land at the tip of Point Possession with the remainder of PPI's "entitlement" (approximately 4160 acres) handled in one of two ways depending on whether or not PPI participated in a land exchange for oil and gas interests on the coastal plain of the Arctic NWR. Negotiations continue.

5) Cook Inlet Region, Inc. (CIRI) - Under § 14(h)(1) ANCSA, CIRI selected approximately 500 acres of refuge lands surrounding the Kenai-Russian River Campground to include partial appurtenances to that complex as well as adjacent Forest Service lands with developed trail and campground facilities. This selection area by BLM Notice dated June 8, 1986, is identified under BLM application AA-11096, and combines AA-11096 historical place and AA-11098 historical place/cemetery as filed by CIRI December 17, 1975.

Existing § 17(b) ANCSA easements reserved for future public access beyond the selected area should conveyance materialize were provided BLM. These easements include the access road to the refuge campground/parking area, campground/parking facilities, the trail adjacent the Kenai and Russian Rivers, and the ferry facilities on both banks providing public transportation across the Kenai River.

Reclamation of CIRI's Wolf Lake No. 2, oil and gas exploratory well pad and access road, was completed in August. Under a refuge sand and gravel agreement, gravel was transported back to the original pit and stockpiled overburden was returned to the drill and access road sites. Topsoil was contoured over disturbed areas and seed and fertilizer placed on contoured sections posing erosion problems to complete restoration.

b. Native Allotments - Kenai Native Association (KNA) President, George Miller, Jr., expressed his desire to place an 80 acre native allotment AA-8229, up for public sale or negotiate a land exchange for a parcel adjacent the refuge boundary near road access. This allotment adjacent to Olson Lake, is isolated within the Andy Simons Unit of the Kenai Wilderness in Section 17, W/2 NW/4, T4N, R7W, SM. A packet identifying 80 acres of refuge lands adjacent the refuge boundary near Stormy Lake was forwarded to Realty for possible land exchange negotiations.

2. Easements

FWS Permit E-205-KE, a right-of-way easement for the Homer Electric Association (HEA) 115kV Fritz Creek-Soldotna power transmission line Intertie, was issued January 28, 1986. This 100 foot right-of-way impacts about 4 1/2 miles of refuge lands adjacent the Headquarters complex, most of which will parallel and utilize the existing 69/115kV transmission line easement. HEA engaged Gilbert/Commonwealth, Inc., of Jackson, Michigan, to analyze and select routings, conduct public meetings, and issue bids for clearing and construction activities.

Clearing the new right-of-way, under refuge permit, began March 20, using two Hydro-Ax's. Chain-saw crews followed, felling more than 200 mature "danger" trees in the first two miles right-of-way south of the Soldotna Airport. The clearing included installation of gates and rock barriers to preclude unauthorized vehicle access to the rights-of-way. The clearing contractor was Larry Smith of D & L Construction, Cooper Landing, AK.

3. Other

a. Boundary change - Relying upon § 303 (4) Alaska National Interest Lands Conservation Act (ANILCA), the official map of October 1978, and several Realty land status maps, the staff was surprised to learn of a boundary error in and near the Nuka River. Under P.L.O. 3953 and P.L.O. 4056, approximately 3,200 acres were withdrawn from the Kenai NWR. This correction leaves that portion south of Kachemak Bay no longer attached to the refuge proper but rather a satellite.

b. Old Refuge Headquarters - A presentation by Chief of Acquisition & Ascertainment Section (RE) Ben Lukes to the Kenai City Council regarding the proposed Kenai Flats/Old Refuge Headquarters land exchange was conducted July 22. After expressing interest in this exchange one week earlier, the City Council decided they were no longer receptive to the proposal.

Following FWS' exchange offer of the old Refuge Headquarters 4.03 acre site at Kenai, in turn for 2,500 acres of lands tentatively offered to us in the Kenai River flats near the City of Kenai, a stoic group of council members resorted to any possible excuse not to trade the wetlands for the old "Moose Range" Headquarters despite the good faith efforts of FWS to negotiate a deal. We trust the City of Kenai or State of Alaska will provide the necessary protection for this important rest area used by the Wrangell Island snow geese during spring migration and seasonally by the Kenai caribou herd.

c. Inholders - The Kenai NWR supports nine (9) private land inholdings (291.19 acres) within its boundaries, with the exception of temporary conveyances to native corporations. Most of these inholdings are about five (5) acres in size although two are nearly 50 acres and one is 160 acres. Until recently they have not presented serious concerns to refuge management. Unrestricted access is usually provided by airplane, boat, hiking trail, or public roads. Recent concerns, however, center on the subdividing and sale of certain properties. Several cabins and other structures have been constructed by new parties within these inholdings resulting in a marked increase of non-traditional vehicle access not available to the general public.

D. PLANNING

1. Master Plan

Regulations needed to implement the Kenai Comprehensive Conservation Plan (CCP) were published in the Federal Register in September 1986. The regulation process was a lengthy one with many delays but it finally paid off. The regulations and justification "Resource needs for regulations on the Kenai NWR" are provided in the Appendix.

A supplemental Environmental Impact Statement was required to address the proposal for additional wilderness designation on the Kenai National Wildlife Refuge. A draft wilderness supplemental EIS to the Kenai CCP/EIS/Wilderness Review was prepared by the Washington Office and refuge staff.

2. Management Plan

a. Skilak Wildlife Viewing Area - In late 1985, the refuge awarded a contract to Land Design North, Inc. of Anchorage, for a conceptual plan for campgrounds and interpretive media for the proposed Skilak Wildlife Viewing Area (SWVA). Contractors visited the refuge throughout 1986, and committed with staff as well as local professionals including Dr. Alan Boraas, professor of Geology and Anthropology at Kenai Peninsula Community College (KPCC), and Boyd Shaffer, professor of Biology and Art.

After several reviews, the concept plan was completed and submitted to the refuge at the end of December, 1986. The plan calls for redesigned campgrounds, wildlife viewing areas, and interpretive media throughout the 42,000 acre Skilak Loop with most development along the 18-mile gravel road.

Skilak Loop is classified as "intensive management" in the Kenai Comprehensive Conservation Plan (KCCP) and proposed as the major wildlife viewing area of the refuge. As such, appropriate restrictions on hunting and trapping are in order. A trapping closure took effect in 1985, but

hunting restrictions were still not in place as 1986 closed, since FWS elected to close the area cooperatively through the State's Board of Game regulatory process rather than Administratively. Anticipating the closure, the refuge has begun working on specific interpretive plans and engineering aspects of the SWVA, fueled by a \$1.3 special appropriation received in 1986 through the efforts of Senator Stevens (R-AK).



In 1986, the refuge received major funding to improve the Skilak Loop as a designated Wildlife Viewing Area.

MB

b. Furbearer Conservation - Comments from reviewers within the Federal Wildlife Service were received and incorporated into the 1985 revision of the refuge furbearer conservation plan during 1986. This revision was completed by the end of the year and decisions are being made regarding the extent of public involvement required to publicly review and then implement the plan. Meanwhile, during the 1986-87 furbearer season, a 10 wolf quota was jointly implemented for the northern part of the refuge because of low wolf numbers and the lynx season was closed 20 days earlier by an emergency closure in the central part of the refuge because of low recruitment into the refuge's lynx population in that area.

c. Fire Management - The refuge fire management plan, completed in April, describes in detail the historical, present, and projected incidence and impacts of wildfire on the refuge, as well as the use of fire as a management tool.

The fire history of the Kenai has been shaped by three factors: 1) extremely rare incidence of lightning; 2) a dense human population resulting in a high potential for fire along roads, in popular recreational areas, and in developed areas; and 3) a climate that is generally cool and moist but with drought years occurring every 20 years or longer. These factors, coupled with an efficient fire detection and initial attack system, add up to many years of very little acreage burned with heavy fuel buildups, and periodic devastating fires with a high potential for destruction of life and property.

The general thrust of our fire management program on the refuge is to use prescribed burning and mechanical fuel management techniques along with natural fuelbreaks to "fireproof" our boundaries. As this is accomplished, we will be able to allow some wildfires to run their course, under prescribed conditions, and careful monitoring, with the objectives of increasing habitat diversity and productivity, and reducing the destructive potential of wildfires in drought years.

3. Public Participation

Just when we thought it was safe to start managing, Kenai staff found themselves back in the troubled waters of public participation. Unlike the past few years where public comments were solicited for the Kenai Comprehensive Conservation Plan (KCCP), the meetings held in March, 1986, gave the citizenry a chance to comment on the refuge's access regulations to implement the KCCP.

Many of the access regulations were not new but a reiteration of existing regulations that, in the opinion of the Solicitor's office, had to be published pursuant to ANILCA. In recent years, much publicity and hence confusion was brought about by disclosures that the refuge did not have access regulations and, officers were not writing tickets.

Public hearings culminating the regulatory process were viewed as closing a "window of opportunity" that had allowed some to land their aircraft with impunity wherever they desired. Of three March meetings, only the Soldotna one generated any heat if little light.



Bill Knauer (l) of the Regional Office moderated public hearings on the refuge's reinstated access regulations in 1986. Deputy Refuge Manager Mike Hedrick (r) provided clarification. MB

Although comments favored the motorized restrictions, the vocal minority didn't limit themselves to the public meeting. The next day, Congressman Don Young was buttonholed by special interest constituents who accused the refuge staff of "Gestapo" tactics. After numerous Congressional inquiries and extended dialogue with WO and RO, Kenai once again had access regulations effective September 11, in time to provide some measure of protection for the latter half of moose season.



DRM Hedrick, DRD Olsen, Jeff Powers (Cong. Youngs' staff) and ARM/Pilot Richey upon returning from an overflight of the refuge and a discussion on the need for refuge regulations, August, 1986. MB

5. Research and Investigations

a. Reintroduction, Monitoring, and Management of Caribou (*Rangifer tarandus*) in the Central and Southern Regions of the Kenai National Wildlife Refuge. Investigators: U.S. Fish & Wildlife Service (T.N. Bailey, E.E. Bangs, W.W. Larned). Cooperators: Alaska Department of Fish & Game (T.H. Spraker).

The second year of the 2-year caribou re-introduction on the refuge occurred between April 15-20, 1986. Caribou in the Nelchina Basin, Lake Louise area, were baited into areas, captured with drop nets, and transported in individual crates to the refuge. Transport mortality was greatly reduced compared to the 1985 release, with no actual deaths occurring during transport. Only one caribou failed to leave a release site but the actual cause of death was unknown. A total of 52 caribou were released, one died at release, and two others were killed by wolves within three days. The three release sites were Lake Emma (4/15/86) with 18 caribou (three of which died); Caribou Lake in GMU15C (4/17/86) with 16 caribou; and Green Lake (4/20/86) with 18 caribou (Tables 2, 3, and 4).

Table 2. Caribou released at Lake Emma release site, April 15, 1986

(First release = 1000AM; Second release = 1200N)

Date	Release Location	Sex	Age	Numbers			Status	1986 Calf
				Visual Collar	Ear Tags L/R	Radio Freq.		
4/15/86	Lk Emma 1st Release (1000AM)	F	A	44	536/537	6.930	Dead, Wolf Killed	N/A
		F	A	N/A	511/512	--		
		F	A	30	506/507	6.670		
		F	A	43	503/504	--		
		F	A	41	531/530	--		
		F	A	42	533/532	--		
		F	A	46	519/520	--		
		F	A	47	526-527	--		
		M	Calf	None	534/535	--		N/A
		F	A	N/A	539/538	--	Dead, Died at Release Site	N/A
		F	A	55	541/540	6.911	Dead, Wolf Killed	N/A
		F	A	45	454/455	6.691		
		F	A	52	521/522	--		
		F	A	N/A	589/588	--		
		F	A	53	516/515	--		
		M	Calf	None	524/523	--		
		F	A	54	518/517	--		
		F	A	56	529/528	--		

Table 3. Caribou released at Caribou Lake Release Site, April 17, 1986

(First release = 0700 AM; Second release = 1015 AM)

Release Date	Location	Sex	Age	Numbers			Status 10/1/86	1986 Calf
				Visual Collar	Ear Tags L/R	Radio Freq.		
4/17/86	Caribou Lk 1st Release (0700 AM)	F	A	24	573/574	5.530		
		F	A	37	580/579	--		
		F	A	39	569/570	--	Died 6/86	
		F	A	60	575/576	6.900		
		F	A	61	559/560	5.360		
		F	A	63	572/571	--		
		F	A	64	563/564	--		
		F	Calf	None	562/561	--		
	2nd Release (1015 AM)	F	A	10	554/553	6.750	Dead	
		F	A	18	577/578	--		
		F	A	31	568/567	--		
		F	A	36	552/551	5.420		
		F	A	58	558/557	--		
		F	A	59	565/566	--		
		F	A	62	545/546	--		
		M	A	80	555/556	6.920		

Table 4. Summary of Caribou released on Kenai Peninsula, April 1986.

Date	Release Site	Surviving Caribou ¹		Immediate ²		Injured ³ Caribou	
		Adults		Calves			Deaths
		Male	Female	Male	Female		
4-15-86	LK Emma	0	13 ⁴	2	0	3	0
4-17-86	Caribou LK	1 ⁵	14 ⁶	0	1	0	0
4-20-86	Green LK	<u>0</u>	<u>12</u> ⁷	<u>2</u>	<u>4</u>	<u>0</u>	<u>2</u> ⁸
Total		1	39	4	5	3	2
Total Released		49					

¹Caribou which were still alive after the first 3 days following release.

²Mortality which occurred nearby and within 3 days of release.

³Caribou exhibited obvious injuries immediately upon release (= which running from crates).

⁴Includes 4 radio-collared females (= #30, #44, #45, #55).

⁵Includes 1 radio-collared male (= #80).

⁶Includes 5 radio-collared females (= #10, #24, #36, #60, #61).

⁷Includes 7 radio-collared females (#25, #33, #40, #50, #65, #74, #77).

⁸Adult female #12 = injured right hind leg; yearling male #75 = broken left front leg.



Caribou in crates are loaded into a Bell 205 helicopter at Headquarters Lake for transport to release site at Green Lake, 35 miles to the southeast, April 1986. JF



Caribou are blind-folded to reduce stress during transport in helicopter to the release site. Each adult caribou was fitted with visual neck collars and 17 with radio-collars. JF



Helicopter lifts off with nine caribou in crates for an approximately 30 minute ride to the release site at Green Lake. JF



Caribou arrive at release site at 3,500 feet in the Green Lake Area, April, 1986. TB



Close-up of caribou in crates in helicopter during 1986 caribou release. JF



Refuge Pilot/Biologist Bill Larned and biological volunteer Tom Schumacher prepare to release caribou from crates at Green Lake release site. TB

All caribou immediately left the release areas and scattered over the entire Kenai Peninsula. This contrasted with the 1985 release when most caribou stayed within 20 miles of the release site. By the end of the year, fates were known only of the 17 caribou fitted with radio collars. Of these seven (41%) joined the 1985-released caribou in the upper Funny River Benchlands, four (24%) joined the small group of 1985-released caribou south of the Tustumena Glacier in the Truuli Creek Basin, three (18%) joined the Kenai Lowlands herds, two (12%) joined the uplands (Kenai Mountains) herd, and one (6%) died from unknown causes. Two known herds remain in the desired areas; the larger herd of 50 caribou in the benchlands and 14 in the Truuli Creek Basin south of Tustumena Glacier. Of 17 radio-collared caribou from the 1985 release five (29%) were still in the benchlands, five (29%) were missing, two (12%) in the Truuli Creek Basin, three (18%) were in the Kenai Mountains herd, one (6%) in the lowlands herd, and one (6%) died from unknown causes. Some of the "missing" 1985 caribou are suspected radio collar failures.

b. Lynx (Lynx canadensis) populations in relation to habitat, prey, and mortality on the Kenai National Wildlife Refuge. Investigators: U.S. Fish and Wildlife Service, University of Alaska (Graduate Student, Alaska Department of Fish and Game.

This study, initiated with the University of Alaska in 1986, was a consequence of the previous refuge feasibility study on lynx. Lynx are being studied by graduate student Mike Kesterson in two study areas, a primarily study areas in the 1947 burn lowlands (Swan Lake Canoe System) and a secondary study area in mature forest in the Tustumena Lake Benchlands. Objectives of the study are to:

1. Determine densities, movements, and home range characteristics of lynx in representative lowland successional forest and upland habitats on the Kenai National Wildlife Refuge.
2. Document winter food habits and/or hunting success of lynx in lowland successional habitats.
3. Determine abundance of primary and alternate prey of lynx in both lynx habitats.
4. Provide an area of known lynx numbers to test the reliability of various census techniques.

At the beginning of 1986, seven lynx from 1985 were wearing functioning radio collars in the lowlands (GMU15A) and two additional lynx were radiocollared there in 1986. Of these nine lynx, one had died and two were "missing" by December 31, 1986. In the benchlands, four lynx, initially captured in 1985, wore functioning radio collars at the beginning of 1986. Of these, one dispersed from the benchlands in



University of Alaska graduate student Mike Kesterson attaches a radiocollar to a large male lynx recaptured in May, 1986, during the lynx study. TB

GMU15A, one was taken by a trapper during the 1986-87 season, radio contact was lost with one, and one remained in the benchland. One lynx, initially collared in GMU15A, remained in GMU7 off the refuge.

Concurrent snowshoe hare studies conducted by Student Conservation Association volunteers during 1986 (PHOTO) indicated a rapidly declining snowshoe hare population in the northern and central regions of the refuge. Indicators that the lynx population was responding to a declining hare population included dispersing adult lynx (2), reduced productivity (2), and no known productivity (1) among adult females, and the shifting of home ranges of adults (3).



Student Conservation Volunteers Madeleine VanderHeyden (l) and Bill Buxton (r) prepare to remove a snowshoe hare from a live-trap for ear tagging. TB

The Alaska Department of Fish and Game developed a lynx census technique to test on the refuge. The technique involves running 12-2 mile random transects through lynx habitat by backtracking lynx in the snow and using movement data from radio-collared lynx in the area, extrapolating distances moved into a population estimate.

c. Wolf-Lice and Wolf Population Investigations on the Kenai National Wildlife Refuge. Investigators: U.S. Fish & Wildlife Service (T.N. Bailey, E.E. Bangs. W.W. Larned). Cooperator: Alaska Department of Fish & Game (T.H. Spraker).

Capture examination and treatment of wolves with Ivermectin to control lice continued at a reduced scale on the refuge during 1986. Eleven live wolves were handled, captured and/or fitted with radiocollars during 1986 (Table 5). Although lice were not found on any handled wolf, each was treated with Ivermectin before their release. By December 1986, at least one pack of wolves (Bear Lake) had lice including individual 825/2014, which did not have lice in March and was treated with Ivermectin. No other wolves taken during the 1986-87 trapping season from the refuge displayed symptoms of lice but wolves with lice were trapped and/or observed in GMU15C adjacent to the refuge. It is likely that these wolves use portions of the refuge.

Table 5. Wolves captured, handled, and treated for lice on the Kenai NWR during 1986.

Sex	Age	Date of Capture	Ear Tags		Pack Affiliation	Fate
			L	R		
M	P	1/30/86	827	826	Bear Lake	Died, Snare Injury
M	P	1/31/86	---	---	Swanson Riv	Shed Radio Collar
M	P	1/31/86	---	---	"	"
F*	A	2/12/86	841	840	Loner	Killed by other Wolves
M	A	3/13/86	825	2014	Bear Lake	Trapped 12/86
M	P	3/13/86	823	824	"	"Missing?"
F*	A	3/13/86	828	829	"	Dear: Capture Myopathy
M*	A	6/22/86	893	851	Elephant Lk	Alive
F*	A	8/01/86	292	293	Skilak Lk	Alive
M	A	8/07/86	816	815	Loner	Alive
M	A	8/20/86	853	855	Big Indian?	Alive

*Recaptured wolves from previous years.



Biological volunteer Jim Holyan with an old male wolf recaptured from the Elephant Lake Pack during the summer of 1986.

TB

d. Movements and Fates of Young Trumpeter Swans on the Kenai National Wildlife Refuge, Alaska. Investigators: USFWS, Kenai NWR (T.N. Bailey, E.E. Bangs, W.W. Larned, M.F. Portner).

Although this study was completed in 1985, swans, equipped with radio transmitters that year, were monitored in 1986 to determine if any returned to the refuge. Only one of 13 radioed swans was detected on the refuge in 1986. An adult female, captured on Meadow Lake on July 8, 1985, returned to the same area in April 1986, but did not pair with another adult or nest. It was last located on the refuge, alone on August 27, 1986.

e. Use of the Kenai National Wildlife Refuge's Upper Kenai River by Over Wintering Bald Eagles. Investigators: U.S. Fish & Wildlife Service (T.N. Bailey, E.E. Bangs, W.W. Larned, M.F. Portner)

Eight bald eagles (7 juv and 1 Ad) were captured, equipped with radio transmitter harnesses, and released along the Kenai River (Table 6). One tagged eagle was found dead on Yukon Island, in Kachemak Bay on 29 March 1986. The cause of death was unknown.

Table 6. Bald Eagles Captured and Released with Radio Transmitters in 1986

Date	Age	Sex	Method of Capture	Location Captured	Leg Band #
01-08-86	juv	?	Padded foothold	Lower Kenai River	629-18632
01-23-86	Ad	?	Padded foothold	Lower Kenai River	629-18633
01-24-86	juv	?	Padded foothold	Lower Kenai River	629-18634
01-24-86	juv	?	Padded foothold	Lower Kenai River	629-18635
02-19-86	juv	?	Padded foothold	Lower Kenai River	629-18636
02-19-86	juv	?	Found dead on Yukon Island-Kachemak Bay	March 29, 1986	
02-19-86	juv	?	Padded foothold	Lower Kenai River	629-18637
02-20-86	juv	?	Padded foothold	Lower Kenai River	629-18638
03-05-86	juv	?	caught in trapper's beaver set Rehab	Beaver Dam	629-18639



Eagles were captured and fitted with radio harnesses to follow their movements to and from the Kenai River. In this photo, an adult (l) and juvenile (r) were caught in several padded foot traps set and continuously monitored near a salmon carcass in the Kenai River. TS

Eagle surveys by boat along the Kenai River during 1986 indicate an all time high count of 601 individuals in the 2 count areas on February 11 and 13 (Table 7). Mild winter conditions during 1985-86 kept Skilak Lake ice free until February (Table 8).

Table 7. Ages of bald eagles observed during boat surveys along the Upper Kenai River during winter-spring and fall-winter months, 1986.

Dates	River Route Number						Total		
	1			2					
	Ad	Juv	Unid	Ad	Juv	Unid	Ad	Juv	Combined
01/15/86	51	30		131	76	+6	182	106+6	294
02/11&13/86	107	112		103	115	+3	371	227+3	601
03/14&15/86	50	44	+1	87	50	+7	165	94+8	267
11/19/86				74	41	+5	74	41+5	120
12/17&16/86	53	20		147	42	+4	200	62+4	266

1. Kenai Lake Outlet to Jim's Landing.
2. Lower Skilak Lake Campground to Bing's Landing.

Table 8. Bald eagles observed along ice-free portions of the Kenai River during aerial surveys in 1986.

Date	Adults	Juveniles	Total
01-15-86	241	76	317
02-14-86	207	48	255
03-17-86	148	44	192

No aerial surveys were conducted in fall 1986.

f. Breeding Populations and Productivity of Cormorants and Gulls at Lake Louise and Skilak Lake, Alaska. Investigators: U.S. Fish & Wildlife Service Marine Bird Management Project (J.L. Trapp, A.L. Sows, D.R. Nysewander, T.N. Bailey, M.F. Portner, L. Sharpe, and M. VanderHeyden).

On June 11, 1986 a nesting survey revealed 8 active Double Crested Cormorant nests on the main rocks at Skilak Lake.



Nesting cormorants and glaucous-wing x herring gull hybrids on nesting island in Skilak Lake, in 1986. TB

On July 30, Fish Wildlife Biologist Ted Bailey, Bio Tech Mary Portner and Volunteer Madeleine VanderHeyden along with Liz Sharpe, Wildlife Assistance RO banded 69 Glaucous Winged Herring Gull Hybrid chicks at the Skilak Lake nesting colonies. The chicks were captured from a zodiac and fitted with yellow and black visual bands (ie 191) on the right leg and standardized metal USFWS bands on the left leg.



Volunteer Madeleine VanderHeyden and biological technician Mary Portner leg band gull chicks on Skilak Lake. Nesting colonies are in background. TB

g. Population Status and Habitat and Special Requirements of Marten on the Kenai NWR. Investigators: U.S. Fish and Wildlife Service (T.N. Bailey, E.E. Bangs, W.W. Larned, M.F. Portner, T.V. Schumacher)

A total of eight martens (2 ad, 4 juv. male, 2 juv. female) were live trapped and fitted with radio collars between June 1986 and February 1987. The refuge marten study area centers on Russian Mountain and is bounded by the Kenai River, Russian River, Skilak Lake, and glacier flats. Four marten were caught at Surprise Creek, three at Pothole Lake, and one at Upper Russian Lake. Five marten shed their collars, and to date only one has been recaptured. One trap related mortality was recorded in February 1987.

Home range size, determined from radio tracking, varied from 3.15mi^2 (19 locations) for an adult male at Pothole Lake to 0.16mi^2 (7 locations) for a juvenile female at Surprise Creek. Average home range size for adult males was 2.71mi^2 ($n=2$), slightly larger than 2.60mi^2 reported by Buskirk (1983) for Upper Susitna Basin male marten. (Insufficient data were available to make reliable home range estimates for female and juvenile marten.)



Marten study area in the Surprise Creek Area. Hemlocks occur at higher elevations, white spruce, many killed by bark beetles, occur below the hemlock zone. TB



Marten in the Surprise Creek area. Marten are one of the rarest mammals on the refuge. TS

An effort was made to determine habitat preferences of marten and behaviors associated with habitat types from snow tracking at Surprise Creek. To date, poor tracking conditions and trap habituated marten have made this difficult. Additional snow-tracking surveys have been planned for the winter and spring of 1987 to determine the presence of marten on other portions of the refuge.

Food habits of Kenai Peninsula marten are also being studied. Over 100 scats from summer, fall, and winter have been collected along trails, at resting sites, and from traps, and are being analyzed as time permits.

Provided additional suitable habitat is found on the refuge, a reintroduction of marten may be attempted. Kenai marten are smaller in weight and total length than interior marten and may be a distinct subspecies. Thirty marten carcasses from the Tok area were collected during the winter of 1985-86 to compare with two Kenai marten collected to date. Currently, electrophoresis of muscle tissue has yielded 2 enzymes which may be indicators of subspecies differences, and mitochondrial DNA analysis has yet to start.

h. Kenai Peninsula Interagency Brown Bear Study. Investigators: USFWS (E. Bangs), ADF&G (C. Schwartz), USFS (N. Weiland).

Study team efforts in 1986 concentrated on completing salmon stream surveys, evaluating spring habitat use, monitoring public use of the Russian River trail system, and capturing and radiotracking brown bear.

This year was the end of the 3-year feasibility/habitat use study of brown bear on the Kenai Peninsula. Ground surveys were completed on the Ninilchik River, Benjamin Creek, Goat Creek, Snow Creek, the Russian River, Skilak Glacier Flats, and Tustumena Glacier Flats. Public use of the Russian River System was similar to past years.

Attempts to helicopter capture brown bear in the spring were unsuccessful because poor weather prevented most aerial searches and no bears were located on other flights. Aldridge foot snares were set along Benjamin Creek, Goat Creek, and Bear Creek. Four bear were captured in 112 trap nights but one was euthanized because of an unusually severe foot injury.



Biological technician Mike Jacobs, USFS (1), watches captured brown bear as wildlife biologist Ed Bangs prepares dart for immobilization, Upper Russian Lake area, September, 1986.

TB

Radiotracking flights were made throughout the summer and five tagged bears (2 males, 3 females) were located 100 times. Bears emerged from dens in mid-April. They travelled extensively searching for potential food, but attracted to carrion. They began using spawning salmon as soon as fish became available, and this use continued almost until the bears dened in mid-November. Two tagged males were among the 14 sport harvested this year.

Progress reports for the 1985 and 1986 field seasons were completed. A final report with management recommendations will be completed in 1987.

Plans for 1987 include an intensive effort to estimate brown bear density by a modified Lincoln Index using radio-collars and intensive aerial searches of known concentration areas.



Biological technician Portner with a 25-year-old male brown bear that was captured in a leg-hold snare. EB

i. Fisheries Research/Management Studies

The following Fisheries Projects were conducted on the refuge during 1986, but as of this writing (March 1987), no information was available in the form of annual or final reports to include in the 1986 annual narrative:

1. Fox River Fisheries Studies (USFWS)
2. Moose River Fisheries Studies (USFWS)
3. Tustumena Lake Sockeye Salmon Stocking and Studies (USFWS/ADF&G)
4. Hidden Lake Sockeye Salmon Stocking and Studies (ADF&G)

E. ADMINISTRATION

1. Personnel



Kenai NWR Staff:

Back row: Boylan (6), Bangs (10), Johnston (7), Hedrick (3), O'Guinn (13) Kivi (12), Frates (11). Middle row: Nelson (17), Fenc1 (16), Portner (18), Ward (8), Larned (5), Hare (15), Blaylock (14). Front row: Richey (4), Doshier (2), Bailey (9). Missing: Schumacher

JF 3/87

1986 PERSONNEL
Permanent

1.	Daniel W. Doshier	Refuge Manager	GM-13	PFT	EOD 5/25/86
2.	Robert L. Delaney	Refuge Manager	GM-13	PFT	Trans. 2/14/86
3.	Michael B. Hedrick	Deputy Refuge Manager	GS-12	PFT	
4.	Robert A. Richey	Asst RM Oil & Gas (Pilot)	GS-12	PFT	
5.	William W. Larned	Fire Mgmt. Officer (Pilot)	GS-12	PFT	
6.	Michael F. Boylan	Supv. Recreation Planner	GS-11	PFT	
7.	Richard K. Johnston	Recreation Planner	GS-09	PFT	
8.	Candace D. Ward	Park Ranger	GS-07	PPT	PFT eff. 2/16/86
9.	Theodore N. Bailey	Fish & Wildlife Biologist	GS-11	PFT	
10.	Edward E. Bangs	Wildlife Biologist	GS-09	PFT	
11.	James E. Frates	Facility Manager	GS-11	PFT	
12.	Richard D. Kivi	Equipment Operator	WG-10	PFT	
13.	Elvin "Al" O'Guinn	Maintenance Mechanic	WG-10	PFT	Prom eff 3/30/86
14.	Leslie G. Blaylock	Budget Assistant	GS-07	PFT	
15.	Jeri Lee Hare	Accounting Technician	GS-4/5	PFT	
16.	Patricia A. Fencil	Clerk/Typist	GS-03	PPT	PFT eff. 2/16/86
17.	Deanne K. Nelson	Clerk/typist	GS-03	PFT	EOD 1/05/86

Temporaries

			EOD	<u>TERMINATED</u>
18.	Mary F. Portner	Biological Tech.	GS-05	04/29/85
19.	Thomas Schumacher	Biological Tech.	GS-05	06/30/86
20.	William P. Eickhoff	Park Ranger	GS-05	05/19/86 09/26/86
21.	Karen P. Farrar	Park Ranger	GS-05	05/11/86 09/26/86
22.	Ronald A. Levy	Park Ranger	GS-05	05/11/86 09/26/86
23.	Kathleen Kemsley	Park Ranger	GS-05	05/11/86 09/03/86 Resigned
24.	Sam Evanoff	Park Ranger	GS-05	05/11/86 06/07/86 Resigned
25.	Donna M. Bartman	Laborer	WG-03	07/06/86 01/17/87
26.	Robert P. Campbell	Laborer	WG-03	05/11/86 09/26/86
27.	Albert "Bud" Marrs	Laborer	WG-03	04/13/86 09/26/86
28.	James Farrar	Laborer	WG-03	05/11/86 09/26/86
29.	Susan McFarland	YCC Camp Dir.	GS-07	06/02/86 08/16/86
30.	Andrew Keller	YCC Group Leader	GS-05	06/06/86 08/09/86

Permanent Personnel

January 5, 1986 Deanne Nelson entered on duty as the Clerk/Typist (Receptionist). She transferred from the Center for Disease Control in Anchorage. Dee's arrival was a great relief as she filled the last vacant position in the administrative section. It has been nearly a year since this section was up to full force and the strain was showing on the remaining staff.

Refuge Manager Robert Delaney accepted a position in the Regional Office as the Refuge Supervisor South effective February 16, 1986. As Refuge Supervisor South he became the direct line supervisor of this refuge and

we were in contact regularly with him until he left for Washington DC. He was selected for an Advanced Management Training Program that will last for two years. DRM Mike Hedrick was acting refuge manager from February thru May when Daniel W. Doshier the new refuge manager arrived.



After five years and seeing completion of the Kenai Comprehensive Conservation Plan, Manager Bob Delaney went to Washington. MB

The combining of Full Time and Other personnel ceiling categories into one allocation enabled us to convert both Park Ranger Candace Ward and Clerk/Typist Pat Fencil from permanent part-time to full-time effective February 16, 1986. These two positions had been part-time for several years and scheduled for 32 hours per week. Due to the amount of work, nearly every week each worked 40 hours. Table 9 indicates an increase in full time employees to 16. This increase of three is the conversion of the 2 part-time positions to full time and filling of the vacant clerk/typist position.

Table 9. Staff Breakdown from FY 1982 to FY 1986.

	<u>Permanent</u>		<u>Vacant as</u>	<u>Temporary</u>	<u>Volunteers</u>
	<u>Full-Time</u>	<u>Part-Time</u>	<u>of 12/31</u>		
FY82	12	1	1	5	12
FY83	12	2	2	16	26
FY84	13	3	1	14	25
FY85	13	2	2	10	43
FY86	16	0	1	13	28

Maintenance Worker Al O'Guinn was promoted from a WG-08 to a WG-10 Heavy Mobile Equipment Mechanic effective March 30, 1986 after rewriting his position description to more accurately reflect his duties.

The illness and death on April 27, of Sonny Blaylock, husband of BA Leslie Blaylock, had a major effect on this refuge during 1986. Leslie, a crucial employee, was greatly missed during Sonny's illness. In December 1985 Sonny Blaylock was diagnosed as having cancer. Due to the possibility that Leslie would require a long period of annual leave, she spent most of her time with the new administrative employees, AT Jeri Lee Hare and CT Dee Nelson, giving them a crash training program. The week of March 17, Leslie went to Anchorage with her husband and did not return to work until May 5.

March thru April is a very busy time as all seasonal employees are hired and many supplies are purchased for field duty. During this period the remaining administrative staff of CT Pat Fencl, AT Jeri Lee Hare and CT Dee Nelson did an outstanding job performing the administrative functions in Leslie's absence.

May 27, 1986 Daniel W. Doshier arrived on duty as Refuge Manager. He was reassigned from the Washington FWS Office of Resource Management. His family remained in Virginia until the house was sold, and on September 2, his wife Pamela and four children arrived.

An attempt was made to fill the permanent part-time position of WG-5 Maintenance Helper (position was retitled Mobile Equipment Servicer.) The position was advertised, individuals interviewed, and a selection made at the field level. When the paperwork arrived in the Regional Office personnel ceiling reductions had come down from the Washington Office and this hiring action was cancelled.

Temporary Personnel

Summer seasonal staff increased by three positions this past year (Table 10). We anticipated hiring more Park Rangers and Laborers for visitor services with the Congressional "Add-on" funds for the Skilak Special Management Area, but with a reduced personnel ceiling (FTE's) from 21.5 person years to 20.8 we were unable to do so. The money was available, but without the increase in FTE's further hiring was not possible. At the end of FY 1986, Kenai's FTE total was 4 days under the allocation of 5408 days.

Table 10.

Temporary Positions

	1982	1983	1984	1985	1986
Biological Aid & Techs.	2	4	3	1	2
Laborers	2	6	4	3	4
Park Technicians	3	3	4	3	5
YACC/YCC Staff	3	3	3	3	2
Clerk/Typist	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	11	16	14	10	13



Part of Kenai's summer staff. Back row (L-R) SORP Mike Boylan, Park Ranger Bill Eickhoff, Park Ranger Karen Farrar, SCA Volunteer Kevin Roy. Front row (L-R) SCA volunteer Andrea Stahl, SCA volunteer Jean Evanoff, Park Ranger Kit Kemsley, and SCA volunteer Patrick Stangl. JF

Generally, temporary positions terminated in September at the close of the fiscal year, with some remaining until January. The temporary biological technician (wildlife) position filled by Mary Portner on April 29, 1985 was extended through April 28, 1986. With Office of Personnel Management's permission, we extended Mary's position through April 28, 1987. This saved the FWS as much as \$3,000 in training and orientation costs while increasing the efficiency of our biological program.

The second biological technician (wildlife) position filled by Tom Schumacher on June 30, 1986 was extended to June 29, 1986. Two temporary biologists working during winter has enabled Kenai to complete work that otherwise would not have been done.

As the Kenai NWR was selected Sign Shop for the Region, temporary Laborer Donna Bartman was extended from September 26 through January 17, 1987, to complete needed work on signs.

Our YCC staff was reduced by one position this year. We reduced the number of enrollees from 15 in 1985 to 12 in 1986, due to ceiling reductions.

2. Youth Programs

YCC Enrollees

 All Entered on Duty 06/09/86 - Remaining Terminated 8/01/86

- | | |
|-------------------|---------------------|
| 1. Michael E. Dye | 7. William Allen |
| 2. Donna Gossett | 8. Dawn Lawson |
| 3. Renee Price | 9. Perry Miller* |
| 4. Daniel Nelson | 10. Michael Bernard |
| 5. Susan Towne | 11. Edward Swan |
| 6. Susan Hunter | 12. Rachel Wardell |

*Youth Leader /

Kenai's 1986 Youth Conservation Corps camp was comprised of two group leaders and 12 enrollees, with one designated a "Youth Leader". Personnel constraints demanded we bring on one group leader only one week before enrollees arrived, which would normally not have allowed sufficient time for planning. Thankfully, Sue MacFarland was a group leader the previous year and her experience and organizational skills enabled her to have nearly everything ready. Her situation was made doubly difficult by the fact that the remaining group leader, Andy Keller, of Minnesota, arrived two days before camp started.

Work projects for 1986 concentrated on campground maintenance, trail maintenance, and restoring the refuge's Outdoor Education Center.

Due to logistical problems associated with moving 14 people, their food, and equipment around a 2 million acre refuge, Kenai's YCC uses extended "spike camps" to improve efficiency. This year, the 8-week camp included the initial week's orientation session, followed by three 10-day spike camps, interspersed with four days of rest each session and concluding with a final 5-day spike camp.

As always, time was allowed for orientation. The first 3 days were this year's YCC orientation. Day 1 activities included an introduction to Kenai NWR, its purpose, history, and staff; payroll paperwork; and a swimming test coupled with a lesson in canoe safety in an afternoon at a local pool. Day 2 orientation activities focused on outdoor skills including bear safety; minimum impact camping; and how to live in the outdoors (duties, personal hygiene, etc.). On the final day of orientation, enrollees concentrated on tool safety, inter-personal skills, and group dynamics, and concluded with a discussion on conduct, behavior, and resource issues on the Kenai Peninsula.

The remaining two days of week #1 allowed enrollees to practice tool skills and group interaction during work projects at refuge headquarters, including maintaining cross-country ski trails and reclaiming old ORV trails.



When not working in remote areas of the refuge, YCC enrollees worked around HQ fixing up their storage area. JF

For the next seven weeks, enrollees rehabilitated 10 miles of the most popular refuge hiking trails including Fuller Lakes, Hidden Creek, and Skilak Lookout. All trails receive a lot of use, are quite wet, and require extensive stabilization.

The Fuller Lakes Trail was re-routed to include a more accessible trailhead with improved parking, steps made from railroad ties, and a bulletin board. The project, including brushing five miles of trail, took nearly three weeks to complete including a 3-day delay when the trail was closed due to a brown bear and cubs feeding on a moose calf.



One of Kenai's 1986 YCC projects was installing stairs and a bulletin board at the popular Fuller Lakes trailhead.

KF

In addition to trail maintenance, YCC enrollees spent 10 days on the Swan Lake Canoe Trail repairing portages. The YCC work is the only major maintenance this wilderness area gets each year. After a summer's use by 10,000 canoeists, these wet portages require annual replacement and repair to remain passable.

The YCC's final 5-day spike was held at the Outdoor Recreation Center where they painted, cleaned, and generally refurbished the 6 small frame cabins that are used by school groups throughout the year.

As always, environmental awareness was a programmed part of YCC. Supervisory Outdoor Recreation Planner Mike Boylan and Park Ranger Candace

Ward led the group in evening environmental awareness activities on occasion to supplement Group Leader Andy Keller's weekly evening activities. Field trips to the ADF&G's Crooked Creek Fish Hatchery, at the Russian River Falls to learn about spawning salmon from a State biologist, and a seasonal finale day-long raft trip down the Kenai River were this year's major trips.

The YCC year ended on the final work day with enrollees and parents returning to the Visitor Center at 7:00 for a pot-luck dinner and a brief award ceremony. Good work projects, no major safety incidents, and memorable environmental awareness contributed to 1986 YCC's successful summer.

On July 29, YCC Coordinator Jack Morrison from Washington visited Kenai to talk with enrollees. Also in late July, the YCC enrollees from the Anchorage Regional Office, under the supervision of Mark Bertram and accompanied by Regional Archaeologist Chuck Ditters, spent an afternoon with their Kenai counterparts seeing "how the other half lived." The different duties and lifestyles of the urban and rural young people was interesting for all but at day's end no one indicated they wanted to change places.

4. Volunteer Services - Visitor Center

Kenai's volunteer program offers people interested in contributing to the refuge several options. Local volunteers must donate at least 16 hours of service per month in the refuge visitor center. Their duties include providing information on wildlife and the refuge to visitors. They host interpretive programs such as the weekend wildlife films and operate audiovisual equipment. In return, they receive: 1) membership in the Alaska Natural History Association and a 15% discount on books, cards, posters, etc. sold at outlets throughout Alaska; 2) awards based on hours of service which include KNWR T-shirt, refuge poster, refuge wildlife pins, wildlife books, and airplane trips over the refuge; and 3) "Volunteer Appreciation Nights" with awards, certificates, and pizza.

Volunteers contributed 2,000 hours of service operating the refuge Visitor Center. Without their efforts, it would be difficult to maintain extended Visitor Center hours on weekends and from 4:30 to 6:00 pm in the summer.

For the past several years, Kenai's biological, public use, and maintenance programs have prospered well beyond what staff alone could have accomplished through the creative and consistent use of volunteers. More recently, due to the consistently high-quality of applicants and ease of recruitment, the refuge has made increased use of volunteers from the Student Conservation Association (SCA). While SCA's are not "volunteers" in the strictest sense of the word since they receive a food and travel allowance, they fill a large gap that heretofore existed in accomplishing routine seasonal tasks on the refuge while learning about career choices.

Bill Knauer, Regional Volunteer Coordinator, deserves much credit for recruiting and disseminating outstanding volunteer applications from the public.

Kenai's volunteer program, which involves some 30 people annually and thousands of hours, is comprised of two types of volunteers. Seasonal Volunteers are people from outside the immediate area who work at least three months continuously for 40 hours each week. Generally, these volunteers come from the ranks of the SCA, but we've also been able to attract qualified biology volunteers as well as an occasional public use assistant. Seasonal volunteers receive \$450 a month for food and essentials and free housing. In addition to this, SCA volunteers receive round trip airfare. The daily rate paid to SCA's is equal or higher than paid elsewhere in Alaska by NPS and others and refuge housing generally superior. By offering attractive living conditions, we feel we can recruit the highest-quality personnel and expect more of them. Their appreciation for this treatment has been reflected in their work.

Local volunteers are viewed as the backbone of the refuge program since 1) they are volunteers in the true sense of the word, and 2) they provide an invaluable link to the local communities where anti-government feeling has often been the rule.

Kenai maintains a cadre of a dozen local volunteers. Most are women who meet the 16 hours/month minimum requirement by working alternating weekends in the refuge's visitor center showing wildlife films and answering questions. If it were not for these volunteers, not only would the visitor center's weekend hours be reduced or eliminated but refuge law enforcement would likewise be reduced as park rangers' time would be dedicated to operating the visitor center. The refuge visitor center attracted 30,000 people in 1986 and during non-tourist months of September-May wildlife films averaged over 200 people each weekend. This in a community of only 8,000. At least twice each year, before summer and at the holidays, a volunteer pot luck is held where staff and volunteers get together for a slide program, food, socializing, and awards to outstanding volunteers.

By year's end for 1986, Kenai had used the services of 16 local volunteers who contributed 2,400 hours. Our 12 seasonal volunteers contributed 6,000 hours. In total, 28 volunteers contributed the equivalent of over four person-years of work to refuge operations in 1986.

5. Funding

Table 11. Kenai National Wildlife Refuge funds and position patterns - FY 1981 through 1986.

FISCAL YEAR	1982	1983	1984	1985	1986
<u>PERSONNEL</u>					
FTE's Person years	17.3	18.5	21.5	21.5	20.8
PFT Positions filled	12	12	13	13	16*
Vacant PFT 12/31**	10	10	8	8	7
PPT Positions Filled	1	2	3	2	0*
Vacant PPT 12/31**	2	1	0	1	1
Temporary	8	13	10	7	11
Temp. Intermittent	0	0	1	0	0
YCC Staff Positions	3	3	3	3	2
Vacant YCC Staff	1	1	1	0	0
YCC Enrollees	13	18	20	15	12
Volunteers	12	26	25	43	28

*Conversion of 2 PPT's to PFT.

**Vacancies from Organization Chart.

OPERATING & MAINTENANCE FUNDS

Wildlife Funds	669,000	970,000	928,000	863,000	953,000
Fisheries	0	0	10,000	30,000	0
Exp. for Sales	55,000	54,000	62,000	62,000	59,000
Subtotals O&M	724,000	1,024,000	1,000,000	955,000	1,012,000
Small ARMMs	<u>0</u>	<u>0</u>	<u>0</u>	<u>130,000</u>	<u>169,200</u>
Totals	<u>724,000</u>	<u>1,024,000</u>	<u>1,000,000</u>	<u>1,085,000</u>	<u>1,181,200</u>

SPECIFIC PROJECT FUNDS

YCC Funds	0	0	34,693	26,600	27,500
I&R-Fee Area	7,300	0	0	0	0
Fee Area Rehab	52,700	0	0	0	0
Large ARMMs	0	40,000	264,000	225,000	50,000 ^{a*}
Refuge Resource Problem	0	0	0	150,000 ^{b*}	20,000 ^d
Refuge Resource Problem	0	0	0	40,000 ^{c*}	10,000 ^e
Skilak Loop SMA					362,000

Accelerated Refuge Maintenance Management (ARMM)

a. Instream Flow Study*

Refuge Resource Problems (RRP)

b. Water Quality Study*

c. Oil & Toxic Chemical Study*

d. Waste Water Study

e. Caustic Chemical Study

Skilak Loop Special Management Area Funding

*Funds transferred to Habitat Resources for completion of study.

The \$362,000 for the Skilak Special Management Area was a congressional add-on for visitor services and implementation of the Kenai Comprehensive Conservation Plan. Items such as tanks for outhouses, campfire grates, viewing telescopes, small loader for campground work, and picnic tables were purchased. These funds were also used for summer seasonal positions to increase visitor services. Additional funding was received in RO Engineering for engineering, construction, and improvements of campgrounds in the Skilak Loop Area.

Large ARMM funding of \$50,000 involved only one project this year. This was an Instream Flow Study to be completed by Habitat Resources in the Regional Office. These funds were transferred to HR.

Small ARMM funds of \$169,200 were used for maintenance and small projects that did not exceed \$5,000.

Refuge Resource Project funds of \$30,000 were for Waste Water and Caustic Chemical Studies. These funds remained at the refuge to cover salaries related to these two problems.

Funds were increased in the YCC program at the very end of the year to cover costs that would have been paid through our operating budget. We reduced the number of enrollees to 12 to make the group size more manageable for the Group Leaders.

6. Safety

Two young teenage visitors lost their lives on the refuge this year. A 29 year-old man was driving a snowmobile and towing the two boys in a 7-foot dingy. The dingy was attached by a 60 foot rope to the snowmobile, which was traveling at an estimated 25 MPH on the frozen Moose River. At river mile 2.5 the dingy struck a log protruding from the ice, and Lance Hammarstrom 13, and Travis Bunnell 14, received fatal spinal injuries. The Kenai NWR was closed to snowmobile use at the time of the incident due to inadequate snow cover.

Personnel accidents decreased from 8 in 1985 to 3 in 1986. We hope this is attributed to increased safety awareness by employees and not just luck (Table 12).

Table 12. Persommel Accidents.

<u>Types</u>	<u>Number</u>	<u>Doctor Cost</u>	<u>Days Lost</u>
Cut finger while picking up hand tools	1	94.75	0
Slipped on ice while portaging canoe, sprained ankle	1	46.00	0
Back injury while loading box into pickup	1	\$800.00	3
Totals	3	\$940.75	3

The finger injury was to YCC Enrollee Perry Miller. The Perry picked up some hand tools without gloves and cut his little finger. The cut required two stitches, and no work time was lost.

Biological Volunteer Carlos Paez slightly sprained his left ankle. He slipped on ice while portaging a canoe between Lost Lake and Red Squirrel Lake. Again no work time was lost.

Accounting Tech. Jeri Lee Hare injured her back while carrying a heavy box from the Post Office. Post Office regulations prohibited her from using their handcart to carry packages. As a result, new mail pickup procedures have been implemented at this office. We have attempted unsuccessfully for several years to get the mail delivered to the office, less than 2 miles from the post office. Administrative staff still pick up the mail but all package notices are returned to the office and consolidated into one or two runs a week by maintenance personnel. Jeri Lee returned to light duty after missing 3 days of work.

Safety meetings were held monthly with each staff member presenting a topic of their choice (Table 13).

Table 13. Safety Meetings from January through December 1986

<u>Date</u>	<u>Chairperson</u>	<u>Topic</u>
02/03/86	Mike Hedrick	Room to Live, Part I, (Seatbelts)
03/03/86	Bob Richey	To Last a Lifetime (Back accidents)
03/17/86	Ted Bailey	The Thrill Seekers (Office Safety)
04/28/86	Mike Boylan	Wader Safety (Use of Waders)
06/04/86	Ed Bangs	Bear and Gun Safety
06/16/86	Rick Johnston	Prop Strike (Aircraft safety)
07/07/86	Bill Larned	Aircraft Safety (Use & location of fire extinguishers and ELT)
08/25/86	Jim Frates	Firefighter II/III - Portable fire extinguishers
09/22/86	Daniel Doshier	Total Image (Uniforms)
11/03/86	Al O'Guinn	Multiple Choice (Safety/Heavy Equipment)
11/17/86	Dick Kivi	Hands-on use of fire extinguishers
12/29/86	Leslie Blaylock	Winter Driving Tactics (2d Ed) (Winter driving, Alaska style)



All personnel had the opportunity to get practical "hands-on" experience with portable fire extinguishers during our November safety meeting. Here Donna Bartman "loses her cool" -- CO₂ that is.

JF

The September meeting was not held due to scheduling conflicts and the close of the Fiscal Year.

The refuge had three aircraft accidents by the public in 1986, but with no fatalities. This was a vast improvement over 1985 when 9 men lost their lives in a commercial aircraft accident.

F. HABITAT MANAGEMENT

3. Forests

No commercial timber sales were made during 1986. Commercial timber harvest is deemphasized on the Kenai NWR as a wildlife management technique, in favor of prescribed fire and managed wildfire, for the following reasons:

1. Commercial timber stands on the Kenai NWR are spotty, with generally low quality and volumes.
2. Lack of road access to most otherwise suitable stands precludes their exploitation.
3. Timber operations leave numerous undesirable roads and trails which are difficult and expensive to rehabilitate.
4. Demand for timber products is low, and the limited capability of local timber operators make the harvesting of significant acreages a process requiring many years to complete.
5. Timber harvest removes a significant portion of the soil nutrients in a nutrient-poor environment such as the Kenai, which may have long term impacts on forage production and palatability.

For these reasons, we use timber harvesting primarily to provide fuelbreaks adjacent to areas sensitive to fire, and as a habitat management tool in locations where fire may be inappropriate.

Poor road conditions in early December cut the use of the Mystery Creek Road commercial Christmas tree area down to one permittee, who purchased 10 trees for \$1.00 per tree. Most local residents cut their own trees, for which no permit is required.

Public firewood areas serve the dual functions of low-cost habitat enhancement and a source of heating fuel for local people. In 1986 the Finger Lakes firewood area was closed due to lack of wood, but the Funny River Road area was expanded by 50 acres. This area will continue to be expanded southwestward to strengthen a system of fuelbreaks protecting the residential areas south of Soldotna from future prescribed fires and wildfires burning on the refuge. Some 600 free firewood permits were issued in 1986, compared with 555 in 1985.

Due to dwindling State funds, 1986 was probably the last year for the cooperative ADF&G/USFWS habitat enhancement program using the State's 3 Letourneau tree crushers. This year a final 1030 acres were crushed on the refuge, including 230 acres in the Skilak Loop, and 800 acres north of the Sterling Highway near Lily Lake. As in previous years, the mosaic of the 1947 burn was followed, with scattered "islands" of timber left to create a natural-looking pattern with an abundance of "edge". The Lily Lake project was burned later in the year (see §9, Fire Management).

The areas in Skilak Loop crushed and burned in 1984 have come back with moderate to dense stands of willow and aspen sprouts, along with an occasional birch stump-sprout. The poor response of birch may be due to root or other damage caused by the crushers as similar mortality was noted in unburned, crushed portions of the project area.

9. Fire Management

Since 1982, the Alaska Division of Forestry has provided fire protection for the refuge and surrounding lands. Suppression of fires both on and off the refuge was accomplished quickly and effectively using helitack and engine crews.

The fire season was slow in 1986 in spite of occasional periods of high fire danger. The most severe period occurred from 6-18 to 6-24, while suppression resources were committed to fires in the Interior of Alaska. A widespread open burning ban was imposed at the time, however, and no significant fires occurred on the refuge.

There were five fires reported on the refuge in 1986, totalling less than one acre. All were man-caused; four from escaped campfires, and one from an airplane crash. Two fires were in areas designated for limited response. One was suppressed for safety reasons (the plane crash), while the other was monitored, and self-extinguished at one-half acre. The first fire of the year was reported on June 3 and the last was declared out on September 30.

The refuge Fire Management Plan was completed and signed this year, providing us the authority to work-plan fuel management and other fire-related projects. Also drafted were prescribed burning plans for three fuel hazard reduction burns totalling 2230 acres. The Lily Lake burn of 800 acres of crushed 1947-burn spruce and aspen occurred in late July, providing a substantial fuel break to protect the community of Sterling from future wildfires and habitat burns on the refuge. This fire, conducted by personnel from the refuge, Chugach National Forest, BLM, and the Alaska Division of Forestry, provided an excellent learning experience, as it was done with no artificial control lines, minimal crews working a small portion of the perimeter, and no mopup. A prescription was written which would achieve the desired fuel reduction and habitat objectives leaving live timber intact. Initial blacklining required two evenings with a "terra-torch" mounted on a Bombardier track ATV, and the



We have found that we are able to burn crushed spruce cleanly under conditions where the adjacent standing timber will not carry a fire. This saves money on holding personnel and control lines and their rehabilitation.

WL



The Lily Lake fire created the desired mosaic of mineral soil exposure and lightly burned areas. Note the grasses appearing after only one week post-burn.

WL



Smoke management is a critical part of planning and conducting a burn on the Kenai. So far, by carefully picking our burning days, we have managed to keep heavy smoke out of Anchorage, Peninsula towns, and the Sterling Highway. RR



The numerous willow and birch sprouts emerging in the 1984 prescribed burn on Skilak Loop are already being browsed by wintering moose. WL

unit was burned with a helitorch directed from a Super Cub circling overhead. The project went as planned with minor hitches, the weather cooperated, and all major objectives were attained.

One of our biggest concerns on this project, being so close to Anchorage, the Sterling Highway, and the population centers of the Kenai Peninsula, was adverse smoke impacts. Fortunately the wind blew steadily in the proper direction until the smoke production was minimal, and no adverse impacts were reported.

Experience from this burn will help streamline future burns -- especially with similar fuels, thus cutting costs and enhancing safety. The cooperative spirit of other federal and state agencies has been the key to our success in burning operations. These busy people have been generous with their time and resources to help us get our program off the ground. Implementation of burn plans for the remaining 1430 acres of fuel hazards designated for treatment is planned for 1987, as well as a 400-acre habitat burn in live standing timber.

10. Pest Control

Aerial surveys conducted by the U.S. Forest Service (State and Private Forestry, Forest Pest Management) in 1986 detected 54,668 acres of mature white and Lutz spruce dead or dying on the refuge as a result of spruce beetle infestation. Most outbreaks are located in the Mystery Hills - Skilak Lake areas, and in the Fox River drainage -- where extensive stands of mature densely-stocked spruce provide ideal conditions for the insect to breed. The surveyor said that infestations are losing their intensity as host material decreases. Beetle-killed trees are visible from the Sterling Highway between Russian River and Jean Lakes and people want to salvage the dead trees for firewood or houselogs. Since, most of the area is designated wilderness and the remainder is in the Skilak Wildlife Recreation Area, the visual and wildlife benefits don't justify the physical disturbances resulting from wood cutting and removal. Tree removal will be limited to individual trees and small stands which constitute hazards around campgrounds and other facilities.

12. Wilderness and Special Areas

Several issues involving the management of Kenai Wilderness surfaced during 1986, primarily via requests from inholders, the public, and/or oil companies. Proposed activities are examined for compliance within the new Kenai NWR Comprehensive Conservation Plan, ANILCA, The Wilderness Act, and Refuge manual Chapter 6 RM 8.

A draft Refuge Manual Chapter, "Wilderness Management," was reviewed in 1986 and a final draft forwarded to RO. Although the revision is different from the existing chapter, it offers little additional insight regarding specific provisions of ANILCA or the Wilderness Act. The new chapter may increase confusion of existing law rather than provide guidance. Consequently, proposals must be reviewed carefully to insure compliance.

Chevron U.S.A. requested a 228 line gravity survey within the Kenai NWR. Some 68% of this proposal was in designated wilderness. While the proposal did not require motorized equipment, survey and gravimeter crews recorded data at more than 450 stations along nine different profile lines during a 30-day period.

The proposal was denied by refuge staff as an inappropriate commercial activity within Kenai Wilderness. The Wilderness Act prohibits commercial enterprise within units of the Wilderness Preservation and Management System. The refuge also cited ANILCA Sec. 1008 as not authorizing the activity.

The refuge decision was appealed and the Regional Director authorized the proposal was under ANILCA Sec. 1008, although it specifically refers to leasing activities and leasing activities are not authorized in wilderness. Section 4C of the Wilderness Act prohibiting commercial enterprise was also deemed not applicable. It was determined that Chevron was conducting non-commercial scientific mineral assessment within Kenai Wilderness and as long as the access methodology was appropriate, (non-motorized) the activities were not inconsistent with the Wilderness Act. Refuge staff complied with the determination. This interpretation of commercial use within wilderness may provide an open door for other oil companies.

An unauthorized ORV winter access trail developed in 1986 to the Bear Creek inholding on Tustumena Lake within designated wilderness. After inholders were contacted by refuge officers and two individuals received Violation Notices, a meeting was held regarding access via 3- and 4-wheelers along the beach of Tustumena Lake. Inholders wanted a permit to use the so-called "winter route" for ORV access. DRM Hedrick denied the request based on the fact that Congress, allowed use of airplanes, motor boats, and snowmobiles within Kenai Wilderness to gain "adequate and feasible" access and additional means under ANILCA Sec. 1110 were not necessary and could impact wilderness.

The decision was appealed and a Congressional inquiry received. On April 25, 1986, on directions from the RO a Special Use Permit was issued to ORV access by inholders. Prior to issuing the ORV permit in wilderness, the refuge manager had to determine there was sufficient snow cover. The RO denied a second inholder's request for subsistence firewood use.

In a related request, Kasilof resident George Jackinsky asked to use an ORV to subsistence trout fish on Tustumena Lake. Jackinsky was contacted in February by SA Soroka for using a 3-wheeler on Tustumena Lake but not cited because of uncertainty whether Jackinsky was on public land. Jackinsky's request was denied on March 13, by refuge staff, and the denial affirmed after review by the RD.

McLane and Associates Surveys subdivided the Bear Creek inholding of Art Thompson during 1986. The possibility of new property inholders makes the decision to allow ORV's within wilderness more significant as "winter route" applicants increase. McLane and Associates also set several markers which established an accurate knowledge of the lake shore boundary of the inholding. The private property boundary extends west of the confluence of Bear Creek and Tustumena Land and below the high water mark to the 1936 mean high water mark.

Kenai Native Association President George Miller, Jr. expressed his desire to place native allotment AA-8229 up for public sale or negotiate a land exchange for a parcel adjacent to the refuge boundary with road access. This 80 acre allotment is isolated within the Kenai Wilderness in the W/2 NW/4, Section 17, T4N, R7W, SM. At year's end negotiations continued (see "Land Acquisition").

The land transfer status of several thousand acres of Kenai Wilderness at Point Possession remain in limbo at year's end. An administrative law judge is reviewing a BLM decision to award over 4,000 acres of Kenai Wilderness to Point Possession Native Group (see "Land Acquisition").

Wildlife Biologist Ed Bangs went to Washington D. C. in April to work on a supplemental EIS for new wilderness designations proposed by the KCCP.

Final editing and revision of the EIS was completed at the end of August. The Two Indian area (97,500 acres) and the Chickaloon and Tustumena areas (98,000 acres) are being held for future submission of an Alaska wilderness proposal.

Regulations were re-published in August 1986, affecting the canoe systems including:

1. Persons entering the canoe routes of Kenai Wilderness must register.
2. Group size limited to 15 persons.
3. Use of motorized equipment in wilderness, other than authorized motorized vehicles, is prohibited.
4. Operation of aircraft within the canoe route and several other areas of Kenai Wilderness prohibited.
5. Operation of snowmobiles within canoe routes and above timberline areas within Kenai Wilderness is prohibited.
6. Operation of motor boats within canoe routes and certain portions of Kenai Wilderness is prohibited.

(See Appendix for actual refuge regulations and for specific aircraft and snowmobile regulations.)

Visitor use data was collected as in previous years within the canoe route trails via group registration. Table 14 depicts the use data gathered.

Table 14 . Visitor data for years 1980-1986 on the Swanson River/Swan Lake Canoe Routes.

	1980	1981	1982	1983	1984	1985	1986
Total Visitors	3,189	6,824	4,620	6,036	----	5,380	4,151
Total Visitor Days	15,945	34,120	23,100	30,180	----	26,900	20,755

The Tustumena Lake salmon enhancement project entered a new phase during 1986 with Fisheries and refuge staff evaluating the advisability of stocking salmon within wilderness. The project came under review for compliance with FWS policy and the KCCP, as well as biological principals, when evaluating several years of enhancement work. Reviewers will decide whether to continue salmon enhancement, discontinue the program, or continue it as "scientific research."

G. WILDLIFE

1. Wildlife Diversity

Concerns regarding the taxonomic classification of marten on the refuge were addressed in a marten study proposal. One objective of the study is to determine if there are detectable genetic differences between mainland Alaska and Kenai Peninsula marten populations. Results of this study could have implications regarding possible introductions of marten on the refuge in the future.

3. Waterfowl

Snow Geese arrived on the Kenai River Flats, on, or about April 15, 1986, when approximately 300 birds were observed. Peak numbers were observed on April 21, with a conservative estimate of 3500.

5. Shorebirds, Gulls, Terns, and Allied Species

See D. Planning, Section 5. Research and Investigations, part f.

6. Raptors

Thirteen new nest sites of bald eagles were discovered on the refuge during 1986. Although some of these nests may have been traditionally used by eagles over the years, some are believed to be new sites. One example is the nest by Headquarters Lake which was used for the first time within the past 2 years. These eagles were observed perched in trees near the headquarters building several years before the nest was established (Tables 15 and 16).

Table 15. Bald eagle nesting locations, nesting eagles (on 15 May 86) and production (on 18 July 86) on the Kenai NWR, 1986.

TERRITORY LOCATION	Nest Survey		Productivity Survey	
	Status	Checked	Nests	Eaglets
<u>NORTH OF KENAI RIVER (GMU 15A):</u>				
<u>A. ON REFUGE</u>				
<u>I OUTSIDE WILDERNESS</u>				
Torpedo Lake	A	1	1	1
Blizzard Lake on Skilak Lake	A	1	1	0- 2 adult
Afonasi Lake	A	1	1	2
East Fork Moose River (N. Pipeline Rd.)	I	1	nc	-
Moose River near East Fork	A	2	1	1
West Fork Moose River	A	1	1	2
Coyote Lake	A	1	1	2
Pipeline Road/Noname Creek	A	1	1	0
Little Indian Creek	I	1	1	0
Pincher Creek	A	1	1	1
Beaver Lake	I	1	2	0
N. Beaver Lake (3 miles)	A	1	1	1
Mink Creek Lake area	A	1	1	2
Campfire Lake	A	1	1	1
<u>II. INSIDE WILDERNESS</u>				
Jim's Landing	A	1	1	2
Camp Island Lake	I	1	1	0- 1 adult
Loon Lake	I	1	1	0
Clam Lake/Moosehorn Lake Ridge (east)	I	1	1	0
Swan Lake	I	1	2	0
Rock Lake	I	1	1	0- used ?
Spruce Lake	A	1	1	1
Bear Lake	A	1	2	1
NE Moose Lake	I	1	2	3
Chickaloon River near Moose Pasture	A	1	1	2
Chickaloon River near Moose Pasture	nc	nc	2	2-osprey?
Bedlam Creek Bluff	A	2	1+nc	0+?
King Lake	I	1	0	0
Gene Lake	A	2	4	0
Sucker Lake	A	2	2	0
<u>B. OFF REFUGE</u>				
Kenai River near Gwen's Lodge	A	1	1	1
Juneau Creek	A	1	2	2
Moose Point Lake (Birch Hill) area	A	1	1	2
Otter Creek Outlet	A	1	0	0
Stormy Lake	I	1	nc	-
Bishop Creek Outlet	A	1	3	0
"Drained" (Near Suneva) Lake Area	A	3	4	1
Daniel's Lake	A	1	1	1

Table 16. Bald eagle nesting locations, nesting eagles (on 15 May 86) and production (on 18 July 86) on the Kenai NWR, 1986.

TERRITORY LOCATION	Nest Survey		Productivity Survey	
	Status	Checked	Nests	Eaglets
<u>BETWEEN KENAI RIVER/SKILAK LAKE AND KASILOF RIVER/TUSTUMENA LAKE:</u>				
A. <u>ON REFUGE</u>				
I. <u>OUTSIDE WILDERNESS</u>				
Headquarters Lake	A	1	1	2
Funny River	A	1	s/nl	?
Killey River (Lower- North)	I	1	1	0
II. <u>INSIDE WILDERNESS</u>				
Killey River (Lower-South)	A	1	1	0- 1 adult
Upper Killey River/Harvey Lake	I	1	nc	?
Skilak Lake Inlet	I	2	1	2
Skilak Glacial Flats	A	1	1	1
Russian River Burn	A	1	2	3
Bear Creek	A	1	1	0
B. <u>OFF REFUGE</u>				
Kenai River (Salamatof Native Land)	A	2	1	2
Kenai River (North of Brown's Lake)	A	1	1	2
Russian River	A	1	1	2
Beaver Creek Outlet/Kenai River	A	1	1	3
Lower Kenai River (above bridge)	I	1	2	0
Lower Kenai River (Island by college)	A	1	1	1
Kasilof River near bridge	I	1	1	1
Coho Road Gaswell Area	nc	-	s/nl	?
Kalifornsky Beach Road	nc	-	s/nl	?
<u>SOUTH OF KASILOF RIVER/TUSTUMENA LAKE:</u>				
A. <u>ON REFUGE</u>				
Nikolai Creek	I	1	1	?
Upper Fox River	A	1	1	0
Lower Fox River/Clearwater Slough	A	1	1	0
B. <u>OFF REFUGE</u>				
Sheep Creek	s/nl	-	s/nl	-
Bradley River Outlet	A	1	1	1
Lower Deep Creek	s/nl	-	nc	?

Key: New nest located for first time in 1986 is underlined = ????
 A = active; I = Inactive; nc = not checked; s/nl = searched/not located
 ? = unknown; - = assumed no eagles/eaglets at nest; 0 = no eaglets observed.

7. Other Migratory Birds

The Alaska Breeding Bird Survey was conducted along two routes in 1986 by Bio Tech Mary Portner.

The Swan Lake route was surveyed on June 18. Results of the survey as shown in Table 17 indicate the most commonly observed birds were the Swainson's Thrush (78), Alder Flycatcher (57) and the Yellow Rumped Warbler (42). A total of 363 birds of 26 species were recorded. The Alaska Breeding Bird Survey on the Skilak Loop route was completed on June 24. For the first time stop locations were eliminated on the Sterling Highway and the route extended along Skilak Loop and several miles up Mystery Creek Road. The route is now known as Seven Lakes (Table 18). The most commonly encountered birds included Swainson's Thrush (70), Yellow Rumped Warbler (34), and the White Crowned Sparrow (30). A total of 310 birds of 28 species were observed along the Seven Lakes route.

Table 17. Birds recorded on the Swan Lake Route, Alaska Breeding Bird Survey, 1986.

Species	#	Species	#	Species	#
Common loon	5	Tree Swallow	3	Mange Crowned Warbler	17
Trumpeter Swan	2	Gray Jay	10	Yellow Rumped Warbler	42
Greater Yellowlegs	8	Boreal Chickadee	7	Blackpoll Warbler	9
Common Snipe	1	Ruby C Kinglet	18	Northern Waterthrush	7
Great Horned Owl	1	Gray C Thrush	9	Savannah Sparrow	3
Olivesided Flycatcher	11	Swainson's Thrush	78	Song Sparrow	1
Alder Flycatcher	57	American Robin	6	White C Sparrow	16
Pine Grosbeak	1	Common Redpoll	1	Varied Thrush	11
Slate C. junco	38	Rusty Blackbird	1		

Table 18. Birds recorded on the Seven Lakes Route, Alaska Breeding Bird Survey, 1986.

Species	#	Species	#	Species	#
Common Loon	3	Ruby Crowned Kinglet	11	Song Sparrow	1
Sand Hill Crane	1	Gray Ch. Thrush	18	White C. Sparrow	30
Greater Yellowlegs	6	Swainson's Thrush	70	Slate Sided Junco	24
Common Snipe	3	Hermit Thrush	3	Pine Grosbeak	2
GWG X J6	1	American Robin	6	Common Redpoll	16
Arctic Tern	2	Varied Thrush	23	Northern Goshawk	1
O.S. Flycatcher	5	Orange C. Warbler	7	Boreal Chickadee	1
Alder Flycatcher	17	Yellow R. Warbler	34	Savannah Sparrow	6
Tree Swallow	2	Blackpoll W.	8		
Gray Jay	2	N. Water Thrush	7		

Trumpeter swan nesting surveys revealed 39 nesting attempts on the Kenai Peninsula, 36 of which were on the refuge. Swan OOV, first banded in 1972, had 2 cygnets on Two Island Lake and the tent camp operator there had to curtail his operations to allow nesting to occur undisturbed from human activity. Four cygnets were also reared on Scenic Lake where another tent camp operator had to curtail his operation in order to protect the swans from disturbance. A new refuge regulation, implemented in September, prohibits the use of aircraft on lakes where nesting trumpeter swans or their broods are present (Tables 19, 20, and 21).

Table 19. Trumpeter swan nesting locations and productivity on the Kenai NWR, 1986.

Location	Wilderness	Location of Swans	Nested	Early		Late	
				Cygnets	Adults	Cygnets	Adults
North of Kenai R.	Outside	Beaver Lake	X	5	2	5	2
	"	Doroshin Lake	X	4	2	3	2
(Inside Refuge)	"	SE Finger Lakes	X	2	2	2	2
	"	Mink Creek/Lake	X	5	2	4	2
	"	Grey Cliff Lake	X	3	2	3	2
	"	SE Scaup Lake	X	0	0	0	0
	"	Curlew Lake	X	0	2	0	2
	"	W. Hook Lake	X	2	2	2	2
	"	Quill Lake	X	5	2	0	0
	"	Swan Creek	X	6	2	5	0
	"	W. Lark Lake	X	5	2	0	0
	"	Two-Island Lake	X	4+	2	1	1 ^B
	"	SE Warbler Lake	X	1	2	1	2
	"	N. Trapper Joe Lake	X	3	2	3	2
	"	Lonesome Lake	?	3	2	0	0
	"	SE Torpedo Lake	X	0	0	?	?
Subtotal			16	(13)	48	(10)	29

B = banded adult at Two-Island Lake (other adult not seen on or nearby?)

Nesting Survey = 6/2+4+5/86

Early Brood Survey = 7/14/86

Late Brood Survey = 9/19/86 (North of Kenai River)

Table 20. Trumpeter swan nesting locations and productivity on the Kenai NWR, 1986.

Location	Wilderness	Location of Swans	Nested	Early		Late	
				Cygnets	Adults	Cygnets	Adults
North of	Inside	Camp Island Lake	X	4	2	0	0
Kenai R.	"	Grebe Lake	X	4	2	2	2
(Inside	"	Upper Moose River	X	4	2	0	2
refuge)	"	Phalarope Lake	X	5	2	3	2
	"	Angler Lake	X	5	2	0	2
	"	S. Sandpiper Lake	X	0	0	0	0
	"	Diamond Lake	X	?+	2	0	2
	"	Chickaloon River Bog	X	2	2	0	0
	"	Moose Lake	X	2	2	0	2
	"	Aspen Lake	X	0	0	0	0
	"	E. Trigger Lake	X	0	0	0	0
	"	Chickaloon R. Oxbow	X	5	2	0	0
	"	Scenic Lake	X	4	2	0	2
	"	Scenic Creek	X	4	2	5	2
	"	N. Moose Pasture L.	X	0	4	0	0
	"	NE Scenic Lake	?	1	2	0	2
	"	Pepper Lake	?	4	2	4	2
Subtotal			17	(12)	44	(4)	14
GRAND TOTAL			33	(25)	92		

Nesting Survey = 6/2+4+5/86

Early Brood Survey = 7/14/86

Late Brood Survey = 9/19/86 (North of Kenai River)

Table 21. Trumpeter swan nesting locations and productivity on the Kenai NWR, 1986.

Location Wilderness	Location of Swans	Nested	Early		Late	
			Cygnets	Adults	Cygnets	Adults
North of Kenai R. (Outside refuge)	Bishop Creek	X	4	1	2	
	Tony's Lake	X	6	6	2	
Subtotal		2	(2) 10	(2) 7		
South of Kenai R. (Inside refuge)	Inside Killey River Bog	X	0	2		
	" S. Brown's Lake	X	0	2		
	" Fox Lake	X	0	2		
	Big Bay Pond	?	0	0		
	Windy Lake	?	0	2		
	Clearwater Slough	X	9	2		
Subtotal		4	(6) 9	10		
(Inside Refuge)	Outside Bay Lakes Slough	?	0	2		
Subtotal		?	0	0		
TOTAL		6	(6) 9	2		
(Outside refuge)	Gaswell Road Area	X	4	2	3	2
	Pollard's Lake	?	0	2		
	Clam Gulch	?	0	1		
Subtotal		1	(1) 4	5		
GRAND TOTAL		5	(7) 13	7		

8. Game Animals

a. Moose - A winter density count was not done and only a limited fall moose composition count was conducted in 1986 because of low snowfall and poor counting conditions (Table 22). The Mystery Creek crushed area, Skilak Loop, and portions of the 1969 burn were surveyed in cooperation with ADF&G. Results indicated that the number of bulls continues to be very low (6 bulls/100 cows). Calf/cow ratios also dropped a little, but remain good at 35 calves/100 cows. In hopes of increasing the number and size of bull moose in GMU15A, the refuge and ADF&G will propose to the Alaska Board of Game that hunting be restricted to yearlings with spike-fork antlers and bulls with antlers over 50 inches.

Table 22. Moose Composition Counts, Kenai NWR, 1986.

Area	Date	Count		50"+ Bulls	-50" Bulls	Yrlg.	Cows	Cow/1	Cow/2
		Time	Total					Calf	Calves
15A-3	12/7/86	45 min	47	0	0	2	30	15	0
15A-8	12/7/86	1 hr	19	0	2	1	13	3	0
15A-9	12/6-7/86	2.1 hr	50	0	0	0	39	7	2
15A-10	12/7/86	1.4 hr	44	1	0	0	31	12	0

Total - 6 bulls/100 cows. 35 calves/100 cows out of 160 moose

*All yearlings seen were legal if spike-fork regulations were in place.

b. Caribou - Neither upland nor lowland caribou herds were surveyed by ADF&G this year. The upland herd apparently continues to grow, and the number of hunting permits issued was raised to 250 in 1986-87 (200 in 1985-86) making this recreational opportunity more available to the public.

c. Dall's Sheep and Mountain Goat - Dall's sheep and mountain goats were again only partially surveyed in areas south of the Kenai River (Tables 23 and 24). Time and weather constraints did not allow ADF&G biologists to conduct a complete count. The status of sheep and goat populations is not well documented, but both are believed to be expanding slowly. The number of full curl (mature) rams remains abnormally low.

Table 23. Dall's sheep surveys on the Kenai Peninsula in 1986.

Count Area	Date	Count Time	Legal Rams*	Sub-Legal Rams	Ewes**	Lambs	Unid.	Total
856	8/7/86	2.8 hrs	10	74	211	64	0	359
858	7/29/86	3.0 hrs	6	6	14	7	14	47
a	8/7/86	0.4 hrs	2	19	44	15	0	80
b	8/7/86	0.5 hrs	0	1	7	5	0	13
Totals		6.7 hrs	18	100	276	91	14	499

a - Surprise Mountain - closed to hunting.

b - Cooper Mountain - closed to hunting

* - "Legal" rams = 7/8 curl

** - In aerial surveys, the numbers of "ewes" included unidentified young rams and yearlings of both sexes.

Table 24. Mountain goat surveys on the Kenai Peninsula in 1986.

Count Area	Date	Count Time	Adults	Kids	Total
Surprise Mt.	8/07/86	0.4	1	0	1
Cooper Mt.	8/07/86	0.5	22	13	35
854	8/07/86	0.6	60	11	71
856a	7/28/86	2.8	12	2	14
858	7/29/86	3.0	63	24	87
859b	8/06/86	2.8	71	23	94
Total		10.1	229	73	302

a Partial count area south of Green Lake not included.

b Partial count ridge between Kachemak Glacier and Bradley Lake not included.

d. Wolf - Wolf numbers in the northern region of the refuge continue low throughout 1986 when a harvest quota of 10 wolves was established. Four packs observed totaled only 23-24 wolves (Elephant Lake 6-7, Bear Lake 4, Skilak Lake 5, and Mountain Pack 8) prior to the trapping season. Contact was not made with the Point Possession and Swanson River packs but trails in the area suggested comparatively few wolves.

Little is known about wolf numbers or pack sizes in the central and southern regions of the refuge, but these areas carry less prey and are smaller than the northern part of the refuge.



One of four wolves radio-collared during the summer of 1986 livetrapping program to determine wolf numbers on the northern region of the refuge. TB

e. Lynx - Lynx numbers appeared to be increasing in the lynx study area (Swan Lake Canoe System) in GMU15A where lynx trapping has been closed for the past two seasons. All four adult females that were radiocollared denned and three produced litters. In contrast, lynx numbers appeared to be declining in the lynx study area north of Tustumena Lake in GMU15B where there had been a 47 day trapping season. The only radiocollared female lynx in the area did not appear to den and an adult male dispersed from the area.

Because of the declining snowshoe hare population, poor recruitment, movements of adult lynx, and previous mortality rates, it was recommended that the lynx trapping season also be closed in GMU15B. It was not closed but remained open until closed by an emergency order of the ADF&G after the first four weeks because of the lack of recruitment and high harvest in the population.

f. Beaver - Aerial beaver surveys were flown over the Swan Lake (10/27/86) and Swanson River (10/28/86) canoe system areas. All bodies of water were checked in these areas. Fourteen active colonies were observed in the Swan Lake census area compared to 25 in 1985. This 44% decline is believed related to the intensity of beaver trapping in the area during the 1985-86 beaver season. A minimum (reported) catch of 16 beaver were removed from the area. Twenty active colonies were observed

in the Swanson River canoe system census area. This was down 26% from the 27 colonies observed in the same area in 1983. At least 17 beaver were removed from this area during the 1985-86 season. Four active beaver colonies were observed in the Skilak Wildlife Viewing Area in 1986 including the pair of beaver transplanted from Hidden Creek to Rock Lake.



Beaver swimming in roadside lake along Swan Lake Road, October 1986. Beaver are beginning to increase in suitable habitat along roads. Roadside areas were closed to trapping in 1985. TB

g. Marten - Marten continue to be uncommon on the refuge and are apparently restricted to the area surrounding Russian and Bear Mountains. Eight marten were live-trapped in this area. Six (4 male, 2 female) appeared to have been young of the year, and may have dispersed from adjacent Chugach National Forest where marten are more common.

Snow-tracking surveys for marten on other parts of the refuge have been planned for spring of 1987. It seems marten do not occupy much of the suitable and historical habitat available on the refuge.

h. Other Furbearers - Little is known about other furbearers on the refuge. Red fox continue to be rare, wolverine uncommon, and otter numbers are unknown. Tracks and observations suggest coyotes are still relatively common, especially in the 1969 burn area. Nothing is known about mink, muskrat, and weasel populations.

10. Other Resident Wildlife

a. Small Mammals - Small mammal trapping occurred in the uncrushed mature forest and crushed mature forest plots at Willow Lake. October 7-10, 1986 (Table 25). Lower capture rates than previous years may have been related to rainy weather during the trapping period. Red-backed voles and masked shrews dominate the small mammal community. Vagrant shrews were the only other species captured.

Table 25. Small mammal captures in uncrushed mature forest and crushed mature forest, Willow Lake, Kenai NWR, October 7-10, 1986.

Area	<u>Red-backed vole</u>		<u>Masked shrew</u>		<u>Vagrant shrew</u>		Total Catch/ 100 Trap Night
	Adult	Immature	Adult	Immature	Adult	Immature	
Mature							
Crushed	0	11	2	6	0	0	5.3
Mature							
Uncrushed	4	11	0	17	0	2	9.4

b. Others - Capture success of snowshoe hares on the Swanson River Road, Funny River Road, and Campfire Lake live-trap grids indicated a continued decline in the refuge snowshoe hare population (Table 26). Only 31 hares were captured in the Swanson River grid in 1986, compared to 40 in 1985, 54 in 1984, and 34 in 1983. A total of 34 hares were captured in the Funny River grid in 1986, compared to 74 in 1985, 126 in 1984, and 103 in 1983. The Campfire Lake grid, first trapped in 1986, yielded 32 snowshoe hares.

16. Marking and Banding

Reference summary of wildlife tagged - See Table 27.

Table 27. Report of Animals/Birds Taken Under Federal Fish & Wildlife Permit 692350 and 1986 State of Alaska PERMIT 86-27

Species	Date	Activity	Age	Sex	Weight	Status	Area
bald eagle	02/19/86	Radioharnessed	Im	U	11.0 lbs	Released	Don Card's Cabin
bald eagle	02/20/86	"	Im	U		Later died Recovered in beaver trap, rehab. Release 3/6/86	Released at Bings Lndg.
bald eagle	02/19/86	"	Im	U	11.5 lbs	Released	Don Card's Cabin
bald eagle	02/20/86	"	Im	U	10.5 lbs	"	Don Card's Cabin
bald eagle	01/08/86	"	Im	U	11.5 lbs	"	Don Card's Cabin
bald eagle	01/23/86	"	Im	U	14.0 lbs	"	Don Card's Cabin
bald eagle	01/24/86	"	Im	U	11.5 lbs	"	Don Card's Cabin
bald eagle	01/24/86	"	Im	U	12.0 lbs	"	Don Card's Cabin
shrews/voles	10/07/86 to 10/10/86	snapped 26 redbacked voles & 26 shrews				dead	Willow Lake
snowshoe hares	06/07/86 to 08/23/86	eartagged	31 - Forest Lake 34 - Funny River 33 - Campfire Lake			released	Forest Lk/Funny R/ Swan Lk. Rd./Tustumena Lk.
Wolf	08/20/86	radiocollared	Ad	M	100 lbs	released	N. Pipeline
Wolf	08/07/86	"	SA	F	80 lbs	"	Mystery Cr. Road
Wolf	08/01/86	"	Ad	F	70 lbs	"	S. Pipeline
Wolf	06/22/86	"	Ad	M	100 lbs	"	SR Oilfield
Wolf	03/13/86	"	Ad	M	96 lbs	Dead	N. Swan Lake
Wolf	03/13/86	"	SA	M	---	Unk	N. Swan Lake
Wolf	03/13/86	"	Ad	F	---	Mortality	N. Swan Lake
Coyote	08/09/86	eartagged	SA	F	22 lbs	Released	Mystery Cr. Road
Coyote	07/27/86	"	?	F	22 lbs	"	Mystery Cr. Road
Coyote	07/01/86	"	Ad	?	20 lbs	"	SR Oilfield
Black Bear	08/25/86	eartagged	SA	M	51.01 lbs	Released	N. Pipeline
lynx	02/05/86	Radiocollared	Ad	M	26.75 lbs	Recapture, Released	Portage Lake
lynx	04/27/86	"	Ad	M	25.0 lbs	Released	N. Jigsaw Lake
lynx	03/17/86	"	Ad	F	24.0 lbs	Recapture, Released	Moose Pens
lynx	03/12/86	"	Ad	F	22.0 lbs	"	Camp Island Lk.
lynx	01/18/86	"	Ad	M	26.01 lbs	Recapture, Released	Tustumena Lk
lynx	01/01/86	"	Ad	M	24.5 lbs	Recapture, Released	Tustumena Lk
marten	10/31/86	Radiocollared	Ad	M	2.0 lbs	Released, Later Shed Transmitter	Surprise Creek
marten	09/11/86	"	Ad	F	1.8 lbs	Released	Russian Lake
marten	06/25/86	"	Ad	M	2.0 lbs	"	Surprise Creek
marten	07/29/86	"	--	M	2.5 lbs	"	Pothole Lake
marten	07/31/86	"	Ju	M	2.0 lbs	Released, Recaptured	Pothole Lake
marten	08/26/86	"	--	M	2.0 lbs	Released, Shed Transmitter	Pothole Lake
marten	11/15/86	"	--	M	2.0 lbs	Released, Shed Transmitter	Surprise Creek
Brown bear	08/08/86	Eartagged	1 1/2- 2 1/2	F	est. 150 lbs	Released	Russian Lakes
Brown bear	08/09/86	Radiocollared	Old	M	est. 500 lbs	"	Russian Lakes
Brown bear	09/10/86	"	app 5	F	est. 300 lbs	"	Russian Lakes
Brown bear	09/10/86	"	app 4	M	est. 300+ lbs	Mortality	Russian Lakes

Table 27. Report of Animals/Birds Taken Under Federal Fish & Wildlife Permit 692350 and 1986 State of Alaska PERMIT 86-27 (Continued)

Species	Date	Activity	Age	Sex	Weight	Status	Area
Caribou	04/15/86	Radiocollared	Ad	F	---	Released	Fr Lk. Louise to Lk Emma
Caribou	04/15/86	"	Ad	F	---	Released,	"
						Wolf Kill	
Caribou	04/15/86	"	Ad	F	---	Released	"
Caribou	04/15/86	Eartagged	Ad	F	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/15/86	"	Ju	M	---	"	"
Caribou	04/14/86	"	Ad	F	---	Died/Release Site	"
Caribou	04/15/86	Radiocollared	Ad	F	---	Released	"
Caribou	04/15/86	"	Ad	F	---	Wolf Kill	"
Caribou	04/15/86	"	Ad	F	---	Released	"
Caribou	04/15/86	Eartagged	Ad	F	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/15/86	"	Ju	M	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/15/86	"	Ad	F	---	"	"
Caribou	04/17/86	"	Ju	F	---	"	Caribou Lake
Caribou	04/17/86	Radiocollared	Ad	F	---	"	"
Caribou	04/17/86	Eartagged	Ad	F	---	"	"
Caribou	04/17/86	"	Ad	F	---	"	"
Caribou	04/17/86	Radiocollared	Ad	F	---	"	"
Caribou	04/17/86	"	Ad	F	---	"	"
Caribou	04/17/86	Eartagged	Ad	F	---	"	"
Caribou	04/17/86	"	Ad	F	---	"	"
Caribou	04/17/86	Radiocollared	Ad	F	---	"	"
Caribou	04/17/86	Eartagged	Ad	F	---	"	"
Caribou	04/17/86	"	Ad	F	---	"	"
Caribou	04/17/86	Radiocollared	Ad	F	---	"	"
Caribou	04/17/86	Eartagged	Ad	F	---	"	"
Caribou	04/17/86	"	Ad	F	---	"	"
Caribou	04/17/86	Radiocollared	Ad	F	---	"	"
Caribou	04/20/86	Eartagged	Ju	F	---	"	Green Lake
Caribou	04/20/86	"	Ad	F	---	"	"
Caribou	04/20/86	"	Ad	F	---	"	"
Caribou	04/20/86	Radiocollared	Ad	F	---	"	"
Caribou	04/20/86	"	Ad	F	---	"	"
Caribou	04/20/86	Eartagged	Calf/ M	---	---	"	"
			Yrling				
Caribou	04/20/86	"	Ju	F	---	"	"
Caribou	04/20/86	"	Ju	F	---	"	"
Caribou	04/20/86	"	Ju	F	---	"	"
Caribou	04/20/86	"	Ju	F	---	"	"
Caribou	04/20/86	"	Ad	F	---	"	"
Caribou	04/20/86	Radiocollared	Ad	F	---	"	"
Caribou	04/20/86	Eartagged	Ad	F	---	"	"
Caribou	04/20/86	Radiocollared	Ad	F	---	"	"
Caribou	04/20/86	"	Ad	F	---	"	"

18. Injured Wildlife

In 1986, sixteen animals of five species were turned into the refuge for rehabilitation. Of these, six were bald eagles three of which had been injured in traps or snares. All were released. The other three suffered a variety of injuries. These three did not regain flight and were transferred to breeding facilities or zoos. The most commonly injured species was great horned owls, most of which had been hit by cars or shot.

In 1985, the numbers of injured wildlife turned into the refuge for rehabilitation increased to 41 individuals of 19 species, compared to a 1984 total of 27 individuals of 15 species (increase of 66%). Of these 41 individuals, 17 were successfully release (41%) 6 were turned over to breeding, educational, or zoo facilities (15%), and 18 (44%) sustained injuries so serious they were euthanized. In addition to these 41 individuals, the refuge received numerous additional calls during June and July regarding "abandoned" baby birds, despite extensive publicity warning against disturbing these fledglings. Most people were convinced to return the fledglings to the capture sites.



Bio Tech Mary Portner holds an eagle caught by the neck in a snare. The snare was removed and the eagle released soon after. Trappers catch non-target species like eagles all-too-frequently, despite our best efforts. MB

H. PUBLIC USE

1. General

The most notable change in Kenai's public use effort came with the word in early 1986 that the refuge had received a special Congressional appropriation of \$1.3 million to improve "visitor facilities and services" in the 42,000 acre Skilak Special Management Area.

Bisected by an 18-mile stretch of gravel road, the Skilak Loop is the refuge's major recreation area. Dotted with 10 campgrounds and related facilities including boat launches, picnic tables, and toilets, the Skilak Loop provides easy access to the refuge's most popular lakes and the Kenai River.

In the KCCP, the Skilak Loop was designated a "wildlife viewing area" in response to public demand. A joint proposal was agreed upon by FWS and ADF&G to restrict hunting and trapping within the area. In addition, FWS agreed to undertake habitat improvement as well as installation of viewing and interpretive aids. A major rehabilitation of long-neglected refuge campgrounds was also due.

As the first step in rehabilitating the Skilak Loop's campgrounds, overrun by the increased visitation of the last decade, the refuge contracted with Land Design North, Inc. of Anchorage for a conceptual re-design of visitor facilities. As 1986 closed, the plan had been completed and the rest was up to FWS. Engineering schedules calls for preliminary surveys to be conducted in 1987 with construction to begin in 1988 and be completed by summer of 1989. In late 1986, the refuge received another appropriation of \$1.5 million for Skilak Loop, bringing the total to \$2.8 million.

Some 80% of Kenai NWR's 2 million acres is wilderness and much of what remains is relatively undisturbed. The Skilak Loop offers the most concentrated public use facilities on the refuge but with 10 campgrounds in 42,000 acres, even this "intensive" management zone is dominated by natural values.

The Skilak Loop's simple campgrounds originally provided recreation for a few thousand tent-camping Peninsula residents and visitors in the mid-1960's. By the mid 1980's, these same small sized sites had been overrun by 100,000 annual visitors in RV's. As the Peninsula's population increased over 400% along with the growth of Anchorage and tourism. More people, larger vehicles, and inadequate facilities resulted in the proliferation of "pioneered" campsites, off-road travel, destruction of vegetation, and depreciated facilities. Lagging refuge O&M budgets and personnel contributed to the decline of the facilities. The moral of the story is if you don't have such facilities on a refuge, don't start them. As major public use stations like Kenai, Wichita Mountains, and others have learned, however, once such facilities are established, we have little choice but to maintain them in a professional manner. By the close of 1986, it appeared Kenai would at last have the opportunity to do this and provide a quality wildlife viewing/interpretive experience as well.

Another significant development in Kenai's public use program came on March 3-7, when Outdoor Recreation Planner Dave Patterson and EE Specialist Janet Ady of the Regional Office spent the week conducting the "Public Use Review" on Kenai. Reviews are scheduled for all refuges in Alaska in an effort to objectively evaluate each station's public use effort and insure it meets FWS standards.

After interviewing all Kenai staff, a 35-page "Public Use Standard Review and Development Prospectus" was produced detailing deficiencies and projected costs. While there was debate about some recommendations, the public use review is a valuable tool that may improve established programs by providing fresh insights or plan new programs. At Kenai, suggestions received from the review have already been implemented while others await time and/or money.

In summary, with a design plan completed for the Skilak Wildlife Viewing Area and an itemized "Public Use Review and Development Prospective" in hand, Kenai entered 1987 with its course spelled-out.

2. Outdoor Classrooms - Students

Approximately 2,750 students participated in the refuge's environmental education program in 1986. While increased fall use occurred in 1986, the most popular months continued to be April and May. All available spaces for spring field trips were booked by the third week in April. Overall increase in total use (up 10% from 1985) was due to two factors: 1) increased use of the refuge's Outdoor Education Center (OEC), and 2) more field trips during September and October.



Before. . . The refuge's Swanson River Environmental Education Camp's low profile is reflected in an old sign with rope letters. . . MB



. . . and After. The Outdoor Education Center is identified by a routed sign made in Kenai's sign shop by seasonal laborer Donna Bartman that matches other refuge entrance signs. MB

With improved maintenance and word-of-mouth advertising of the refuge's OEC (located off Swan Lake Road adjacent to the Swanson River and Swan Lake Canoe Systems), classes have two major options for field trips, namely, 1) the Visitor Center and Trail in Soldotna, and 2) an overnight trip to the Outdoor Education Center's cabins.

A typical field trip to the Visitor Center lasts five hours, from 9:00 am to 2:00 pm. Students begin with an introductory wildlife film of their choice. Since the refuge's acquisition of 35 new wildlife films and videotapes, classes can focus on learning about particular Alaskan species such as wolves or bears. After the film, students search the exhibit area with clipboards and quizzes to answer questions on various exhibits. Exhibit quizzes focus on concepts such as adaptations, interdependence, communities, and succession. There are four levels of quizzes for grades K/1, 2/3, 4/6, and 7 and above. The development of the K/1 quiz activities, led verbally by adult chaperones, is a popular addition to the EE curriculum. Visitor center activities are followed by lunch at nearby Headquarters Lake. After lunch, students return to their clipboards and pencils to hike the 1/2 mile "Keen Eye Trail" where they answer questions in an accompanying leaflet.

The simple facilities of the Outdoor Education Center allow teachers to increase environmental awareness of students by allowing classes to stay overnight in the six cabins.

Twelve classes and some 200 students used the Outdoor Education Center facility in 1986. Future plans include development of a brochure to promote increased awareness of the facility to Kenai Peninsula and Anchorage schools.

3. Outdoor Classrooms - Teachers

Through 1986 teacher orientation sessions 52 new teachers were introduced to Kenai's environmental education program. Orientations were scheduled for fall and spring months when teachers showed strong interest in field trips.

At present, 180 teachers (or 35% of Kenai Peninsula Borough classroom teachers) have attended a refuge teacher orientation session. Teachers bring classes from as far away as Tyonek, Seldovia, and Anchorage. However, 80% of the classes participating in the refuge environmental education program come from the local communities of Kasilof, Kenai, Nikiski, Soldotna, and Sterling.

In April, Park Ranger Candace Ward travelled to Emmonak, a community within Yukon Delta NWR, to act as co-instructor with Shageluk teacher Pam Randles, for a "Wetlands and Wildlife Environmental Education Curricula" course. Ten enthusiastic teachers from primary through high school participated in this credit course focusing on the declining black brant, emperor, cackling Canada, and white-fronted geese populations. The course was sponsored by FWS, University of Alaska, and the Alaska Natural Resource and Outdoor Education Association.

In October, PR Ward and local science teacher Doug Emery taught a "Wildlife and Wetlands" environmental education course in the Kenai Peninsula Borough Teacher In-Service. Twenty-five teachers and resource agency personnel attended the course and 10 took it for credit through Kenai Peninsula Community College. Refuge staff was pleased with teacher response in the face of decreasing State and local education emphasis.

6. Interpretive Exhibits/Demonstrations

Volunteer John Andrews, a local science teacher who, with his own audio-visual production firm, converted his slide program "Wild Refuge: Fortune and Future of the Kenai" to 1/2" video format. John Andrews and SORP Mike Boylan created this 15-minute program in 1985, and with its conversion to video format in 1986, the refuge was able to offer an orientation to refuge history, wildlife, recreation, and resource management on a regular basis for the public. It was shown in the Visitor Center summer weekdays from 12 to 5 on the hour. Visitors appreciated learning the refuge "story" in an entertaining, concise way.

A Missouri teacher, Donna Brandt, volunteered this summer at Kenai NWR, and completed a self-guided nature brochure for use on the 1/2 mile "Keen-Eye" Trail adjacent to the visitor center.

Several other brochures were developed or reprinted this year and have provided invaluable assistance to visitors. They include:

a. The popular "Kenai Peninsula Recreation Opportunities" brochure, originally published in 1983 by FWS, ADF&G, Alaska State Parks, and the USFS. After a two-year hiatus, this brochure was re-printed by the Kenai and Soldotna Chambers of Commerce and the refuge. Since three of the four agencies, who originally published the leaflet claimed poverty, "creative financing" with the private sector was the only way to restore this valuable brochure depicting the Peninsula's campgrounds, lakes, and fish species.

b. With the advent of new refuge regulations, in mid-September, ORP Rick Johnston developed information brochures on aircraft and snowmobile regulations.

7. Other Interpretive Programs

The refuge's most popular interpretive program continued to be the weekend wildlife film series shown all year. The service began in 1983, and during 1986, 6,850 people attended the series. This is an increase of 1,600 (23%) over 1985.

The popularity of this film series is due to several factors including purchase of a high quality video projection system and 35 wildlife videos and films, as well as extensive publicity and local support. The series has become a local institution due to the continued high quality of its programming.

The addition of a big screen video projection system added a new dimension to the refuge's audiovisual equipment by enabling us to provide a variety of interpretive, educational, and training programs previously impossible. Local wildlife-oriented groups have increased their use of the visitor center for meetings and programs because of the variety of audiovisual media. These groups include the Kenai Peninsula Nordic Ski Club, Kenai Peninsula Audubon Society, Kenai Peninsula Trapper's Association, Kenai Peninsula Community College, and Alaska Bowhunters.

The refuge and Kenai Peninsula Community College (KPCC) initiated the series, "Earth and Spirit, Man and The Environment," this winter with a Friday evening lecture at KPCC followed by a Saturday morning workshop at the refuge visitor center. Speakers included FWS' Dr. David Mech, author of The Wolf; Dr. Tom Lyon, professor at Utah State University and author of books on John Muir; author/naturalist Paul Shepard from California, and Dr. Gary Holthaus, environmental writer and director of the Alaska Arts Council. All speakers were popular and Mech's wolf lecture had capacity audiences at the college (200) and refuge (40). Due to the cooperative success of the refuge and college working together, KPCC instructor Boyd Shaffer scheduled his course, "Mammals of Alaska and the World," at the refuge in 1987.



After lecturing a capacity crowd of 250 people at Kenai Peninsula Community College on Friday night, FWS David Mech conducts a wolf workshop for 40 people at the refuge on Saturday. Mech appeared as part of the seminar series "Earth and Spirit."

MB

Refuge staff conducted a variety of interpretive and educational programs including a bear ecology program for Wildwood Correction Facility, assisted the local Audubon Chapter, at April's "Snow Goose Watch" at the Kenai River Flats, hosted a field trip for the 1986 Association of Interpretive Naturalists Conference in May, provided wildlife slide shows/lectures for the Massachusetts School for Field Studies, Alaska Pacific University, the San Diego Zoological Society, and Florida Friends of Arts and Sciences, among others.

Special training sessions held at the refuge in 1986 included the Kenai Chapter of the Alaska Peace Officers' Association program, "Search and Rescue;" Coast Guard Small Boat Safety Course; and the Arctic Research Center's course, "Rabies Control and Recognition."

In addition to seasonal employees, YCC, and SCA volunteers' training programs, refuge staff conducted a variety of environmental education programs throughout the summer for the YCC.



In an effort to get the Kenai staff behind the "Take Pride in America" campaign, new Manager Doshier personally climbed the pole to raise and lower the flag every day until winter. Park Ranger Ward (ladder) and SORP Boylan watch the solemn ceremony.
LB

8. Hunting

Hunting is popular on the refuge and has changed the composition of wildlife populations, most noticeably, moose (Table 28). Increased hunting pressure has resulted in permit hunts for mountain goat, upland caribou, and moose in GMU15B east. In hopes of increasing the size and number of bull moose in GMU15A to the refuge goal of 30 bulls/100 cows, the refuge staff and ADF&G will propose to the Alaska Board of Game that hunting be restricted to yearling moose with spike-fork antlers and bulls with antlers over 50 inches. Twenty-two Dall's sheep were taken on the refuge this year, an increase of 24% from 1985. To enhance herd growth and hunt quality, the refuge may ask ADF&G to support raising the size of a legal ram from 7/8 to full curl.

Table 28. Big game harvest on the Kenai Peninsula, 1986.

Species	Game Management Units				Total Mortality
	15A	15B	15C	7	
Brown Bear	4 (1)	9 (2)	4	0	17 ^a
	Sport Harvest = 14 (3 Female, 10 Male, 1?)				
	6 on Refuge total				
Black Bear	42	17	79	89	227
Upland Caribou		36 males, 14 Female			50 ^b
Dall's Sheep		22 males			22 ^c
Mountain Goat		Most off refuge			120
Moose	307	22(E) ^d	239	57	711 ^e
		86(W)			

^a includes 2 defense of life & property and 1 study-related mortality.

^b 250 permits issued, 20% hunter success rate.

^c 152 hunters, 14% success rate.

^d 100 permits issued, 63 hunters, 35% success rate.

^e includes all known harvest, 2,677 hunters, 27% success rate.

During 1986, the Alaska Boards of Fish and Game classified the Kenai Peninsula as non-rural, thus eliminating it from subsistence use. However, the Boards will meet again in 1987 to reconsider this decision.

Brown bear harvest on the Kenai Peninsula was similar to 1985; however, of the 14 bears taken, 9 were females. This high harvest of females of reproductive age is of some concern to refuge biologists. The number of brown bears on the Peninsula is unknown and may be as few as 150.

At 227, the black bear harvest was down nearly 40% from the 1985 record of 378. This probably represents a more sustainable yield for the population.

The State of Alaska legalized baiting for black bears in 1983 with a State permit. In June 1984, the State dropped the permit requirement and the refuge required a permit that incorporated the State conditions: 1) only biodegradable materials, 2) baiting not allowed within 1/4 mile of roads or trails, 3) baiting not allowed within one mile of a house or campground, 4) stations signed and clearly marked, and 5) litter and equipment removed after baiting. The refuge added: 1) Baiting not allowed in designated Wilderness; 2) Baiting was allowed only from March 15-May 9, May 26-August 31, and October 15-31. Baiting was not allowed during brown bear season.

In 1985, baiting requirements became more restrictive. Baiting was allowed only from April 1-May 9, and May 26-July 1. Baiting was only permitted west of Swanson River Road and north of Swan Lake Road. A one year "grandfather" clause allowed bear baiters to use the areas they used in 1984, even if outside the 1985 baiting area. Numerous complaints were received in 1985 with baiting allowed anywhere within the open area and the most popular spots became very crowded.

In 1986, the baiting permit was again modified by issuing only one permit per section (1 mile²) in the same baiting area as 1985. Permits were issued on a first-come, first-served basis starting April 1.

This modification was favored by nearly all baiters and few complaints were received in 1986. As the number of baiters in the Kenai area has increased, there have been problems with non-permitted bait stations and many stations were not cleaned up or stands taken down. The impact on harvest is unknown since there is no reporting requirement.

Black bear baiting is becoming increasingly popular (Table 29) and will be carefully monitored and regulated until its impact can be fully documented.

Table 29. Number of black bear baiting permits on the Kenai NWR.

Year	Number of Baiting Permits	Number of Individuals	Maximum # Stations/ Permit
1984	20	20	5
1985	25	38	5
1986	52	86	2

Moose hunter check stations were operated for the eighth year by refuge staff and volunteers (Table 30). Information, regulation compliance, and data gathering are the purposes of the check stations. Three stations were open 204 hours and staffed 430 manhours (numerous staff at individual stations during busy times).

Table 30. Summary of moose hunter check stations operated on the Kenai NWR, 1986.

Check Station	# Days Operated	# Hours Operated	# Hunters Contacted	# Moose Checked Bulls	Cows	# Black Bear Checked
Swanson River	9	118	958	50	8	1
Mystery Creek	5	57.5	161	3	0	1
Marathon Road	<u>2</u>	<u>28.5</u>	<u>113</u>	<u>13</u>	<u>0</u>	<u>0</u>
Totals	16	204	1232	66	8	2

Swanson River Check Station operated for nine days and contacted 958 hunters. Some 58 moose and one black bear were checked through, including eight cow moose by permit. Mystery Creek Check Station was operated for five days and 161 hunters with three moose and one black bear were checked through. Marathon Check Station was operated for two days and 113 hunters were contacted. Thirteen bull moose were checked through. Hunter effort was heavy as were complaints about the lack of bull moose.

As in previous years, check station information provided assistance to refuge officers, the public, and State Fish and Wildlife Protection officers.

Small game hunting remained popular along road accessible portions of the refuge, but declining snowshoe hare populations resulted in reduced hunter success.

Waterfowl hunting was poor on the Chickaloon Flats and the Kenai River outlet. Waterfowl populations were down and hunting success mirrored this situation.

9. Fishing

Sport fishing remained a major public use activity in 1986. Lake and stream fishing for trout are popular throughout the refuge. While most fishing occurs during open water months, however, ice fishing is also popular with excellent catches of landlocked silvers, rainbow trout, lake trout, and Dolly Varden Char. Ice fishing occurs at several fly-in lakes with King Lake within Kenai Wilderness being perhaps the most popular fly-in lake. Other popular fly-in lakes include Wilderness, Gene, McLain, Beaver, and Campfire. Popular hike-in lakes include several

within the canoe routes and several within one mile of Swanson River and Swan Lake roads. The most popular hike-in lakes include Forest, Canoe, Nest, Willow, Upper Jean, Paddle, Gruskka, Finger, and Silver Lakes.

The most popular ice fishing lakes are those with good year around vehicle access to refuge facilities. Hidden Lake receives the most use for ice fishing on Kenai NWR, followed by Engineer and Dolly Varden lakes, respectively. Other popular roadside lakes in descending order of visitor use are Watson, Kelly, Petersen, Rainbow, and Skilak (when ice covered) lakes. Several roadside lakes allow highway vehicle access to the ice when conditions permit.

Ice fishing (except Hidden Lake on a sunny weekend) is generally low density; however, the long winter makes overall ice fishing use and certain lakes' harvest significant. Table 31 shows results of the 1985 freshwater sport fisheries.

Table 31. Kenai Peninsula Freshwater Sport Fisheries, 1985.

	<u>Days</u> <u>fished</u>		<u>Est. % occurring</u> <u>on KNWR</u>
	(non-guided)	(guided)	
Kenai River - (Soldotna Bridge to Moose River)	60,915	5,185	7%
Kenai River - (Moose River to Skilak Outlet)	53,390	2,514	15%
Kenai River - (Skilak Inlet to Kenai Lake)	35,738	798	70%
Russian River	80,054		70%
Kasilof River	24,103		5%
Swanson River	4,058		90%
Other Rivers	6,572		20%
Hidden Lake	3,676		100%
Canoe Lake System	7,058		100%
Moose River	555		90%
Other Lakes	13,610		50%

The above statistics represent survey data for 1985, and were published in 1986*.

*See Alaska Statewide Harvest Report, 1985, for species breakdown.

Russian River fishing was very good during 1986; however, the record salmon run and effort of 1985 were not equalled. The early run was the fourth largest on record and the late run was the second largest on record.

The early Russian River sport sockeye harvest was 35,099 fish with approximately 29,000 man days of effort. The late run harvest was 30,813 with 22,400 man days of effort. Alaska Department of Fish and Game creel census reports showed that fish caught per hour of effort was .21 for the early run, and .32 for the late run. While not records for angler success, this depicts a very productive fishery in June, July, and August.

The fishery lasted 67 days with 754 and 668 man-days of effort expended on weekdays during the early and late runs, respectively and 845 and 963 on weekends for the early and late runs, respectively.

Generally, the 1986 figures reflect a continuation of recent years' data which show less effort at the Russian River with increased catches per man-day of effort (Table 32).

Table 32. Estimated sockeye salmon harvest, effort and success rates on Russian River, 1963-1986.

Year	Harvest			Total Effort (Man-Days)	Catch/ Hour	Census Period
	Early Run	Late Run	Total			
1963	3,670	1,390	5,060	7.880	0.190	6/08-8/15
1964	3,550	2,450	6,000	5,330	0.321	6/08-8/16
1965	10,030	2,160	12,190	9,720	0.265	6/15-8/15
1966	14,950	7,290	22,240	18,280	0.242	6/15-8/15
1967	7,240	5,720	12,960	16,960	0.141	6/10-8/15
1968	6,920	5,820	12,740	17,280	0.134	6/10-8/15
1969	5,870	1,150	7,020	14,930	0.094	6/07-8/15
1970	5,750	600	6,350	10,700	0.124	6/11-8/15*
1971	2,810	10,730	13,540	15,120	0.192	6/17-8/30*
1972	5,040	16,050	21,090	25,700	0.195	6/17-8/21
1973	6,740	8,930	15,670	30,690	0.102	6/08-8/19*
1974	6,440	8,500	14,940	21,120	0.131	6/08-7/30*
1975	1,400	8,390	9,790	16,510	0.140	6/14-8/13*
1976	3,380	13,700	17,080	26,310	0.163	6/12-8/23*
1977	20,400	27,440	17,840	69,510	0.168	6/18-8/17
1978	37,720	24,530	62,250	69,860	0.203	6/07-8/09
1979	8,400	26,830	35,230	55,000	0.136	6/09-8/20*
1980	27,220	33,490	60,710	56,330	0.245	6/13-8/20
1981	10,770	23,720	34,440	51,030	0.156	6/09-8/20
1982	34,500	10,300	44,820	51,480	0.261	6/11-8/04**
1983	8,360	16,000	24,360	31,890	0.117	6/08-8/09**
1984	35,880	21,970	57,850	49,550	0.238	6/04-8/19**
1985	12,300	58,410	77,710	50,770	0.286	6/13-8/16**
1986	35,099	30,813	66,012	51,400	0.240	6/14-8/20**

* Census period was not continuous during these years due to emergency closures required to increase escapement levels.

** Census period was not continuous during these years do to negligible fishing effort after completion of the early run and prior to arrival of late run.

The sport fishing interest in the upper Kenai River continues to increase with the majority of refuge visitor days being walk in bank fishing and boating. A significant number of upper Kenai River boaters are involved in sport fishing. Alaska Division of Parks recorded use data for 1986. In 16 river trips, rangers observed 165 non-guided and 49 guided watercraft on the upper Kenai, and 2,088 bank fishermen. Six trips occurred during peak Russian River salmon runs accounting for several days of 100-400 bank fishermen at the Russian-Kenai River confluence. Between 20 and 60 bank fishermen were observed on most days.

ADF&G contracted with the University of Alaska for a two-year rainbow trout study on the upper Kenai River by graduate student Bob Lafferty beginning in 1986. Lafferty reported an even age distribution of rainbow trout with good population recruitment. He estimates 3,500 rainbow trout with a confidence of ± 1000 from Jim's Landing up. This translates to 300-400 fish per mile. Considered partially glacial water, the Kenai is a moderately productive water body for rainbows and is about average compared to lower 48 states natural rainbow producing streams.

Both observations and census interviews indicate a good voluntary catch-release program with an estimated 84% of rainbow trout caught by guides being released. Approximately 35% of fish caught over eight inches during the study had prior hooking scars on them with only 5% severe enough to affect the health of the fish.

The vast majority of angler days occurred above Jim's Landing and bank fishing accounts for most angler days. Bank fishermen are significantly less successful than boat fishermen and fewer boat anglers catch many more fish. Bank fishermen are generally non-guided and less likely to release trout while the more successful guided fishermen return most fish.

10. Trapping

Important changes were made in the refuge trapping program for the 1985-86 season. ADF&G closed the lynx trapping season in GMU15A and the season was shortened from November 10-March 15 to December 15-January 31 over the remainder of the Kenai Peninsula. Wolf hunting and trapping was also closed by emergency order in GMU 15A on February 15, 1986 when the minimum agreed upon number of wolves (35 in packs) could not be found.

After many meetings with refuge trappers and ADF&G, the refuge trapping permits were modified. These special conditions (See Appendix), while mild compared to most areas of North America, represent a drastic change for Alaska. Under State regulations there are almost no regulations governing trapping other than season length and the mandatory sealing of wolf, lynx, wolverine, beaver, and river otter pelts.

The new conditions were controversial and compliance was not good initially but improved as the season progressed. While the changes were unacceptable to a few trappers who decided to trap elsewhere, 1985-86 records indicate the number of refuge trappers and furbearer harvest (See Appendix) were similar or even slightly up from past years. Many trappers welcomed the conditions as a solution to the situation that had developed with over lapping intensive effort, trap theft and general free-for-all situation. While the new trapping permit stipulations were a step in proper regulation of the trapping program, additional changes are needed to address public as well as trapper concerns and to manage the resource on a sustained-yield basis. (See Appendix for example of refuge trapping permit packet.)

11. Wildlife Observation

Despite being in existence since 1941, and at 2 million acres covering a large portion of the Kenai Peninsula, the Kenai National Wildlife Refuge doesn't have a reputation as a place to observe wildlife. A major reason is lack of access. With some 80% of the refuge as wilderness, much of it is inaccessible except to those with aircraft or who have the time for extended trips. Also, dense boreal forest makes wildlife viewing difficult even under the best conditions. Thirdly, as a resident game refuge, many of the wildlife species do not occur in concentrations that allow for easy viewing such as wolves, lynx, and brown bear. Finally, of those species that should be most easily seen, such as moose and caribou, the latter were extirpated by hunting and a small herd was only recently reintroduced. Moose cows and calves are abundant but bulls, especially over two years old, are rare due to extreme hunting pressure in all but the most remote areas.

The irony that wildlife cannot be readily seen on a two-million-acre national wildlife refuge in Alaska has not gone unnoticed. The National Audubon Society, once claimed that the only bull moose to be seen at Kenai "is on the entrance sign." Dr. Durward Allen of Purdue, referring to excessive hunting and trapping, opined that Kenai was a refuge in name only.

Similar concerns were expressed in public testimony on the Kenai Comprehensive Conservation Plan (KCCP) as well as through unsolicited public comments and letters (see Appendix).

Such criticisms made improved opportunities for wildlife viewing imperative and as a result, the KCCP, signed by the Regional Director in mid-1985, called for the creation of a "Skilak Wildlife Viewing Area". Guidance was needed if the refuge was to adequately prepare for an area of this size (42,000 ac.) which sustains most refuge recreation facilities including campgrounds, boat launches, hiking trails, and 30 miles of road, all of which were in need of remedial maintenance.

As a result of the 1985 court case involving St. Matthews Island, the refuge's Tustumena Lake Campground, originally proposed as trading stock, remained as native selection by Cook Inlet Region, Inc. (CIRI). As a result, \$70,000 earmarked for campground rehabilitation was available for other purposes. A Request for Proposals was advertised for a design plan for the Skilak Wildlife Viewing Area and awarded to Land Design North, Inc. of Anchorage for a plan to be completed by October 1, 1986.

By the end of the summer, LDN had been provided all pertinent documentation as to refuge visitation, public use goals and objectives, and related materials. Four on-site visits had been made by LDN personnel including field investigations with refuge biologist Ted Bailey, ORP Mike Boylan, as well as Boyd Shaffer, long-time resident and biology instructor at Kenai Peninsula Community College who took classes

through the Skilak Loop for over two decades. Dr. Allan Boraas, anthropology/geology professor at Kenai Peninsula Community College and local historian, also assisted LDN personnel with field investigations associated with the interpretive planning purposes.

After RO and staff review, the design plan, including campground rehabilitation, wildlife viewing, and interpretation within the 42,000 acre Skilak Wildlife Viewing Area, was completed by the end of December.

As 1986 began, the refuge was informed it had received a special Congressional appropriation of \$1.3 million "to improve visitor facilities and services" within the Skilak Wildlife Viewing Area. As 1986 drew to a close, the refuge received a second appropriation in FY 87 of \$1.5 million for the same purpose. Kenai's controversial wildlife viewing area (originally proposed by ADF&G in 1975) had a preliminary design scheme and a bank account of up to \$2.8 million to implement it. The new funding meant a designated area where visitors could see wildlife from boardwalks and observation decks as well as learn from outdoor interpretive exhibits might become a reality. Successful implementation at the Skilak Wildlife Viewing Area is contingent upon restrictions on hunting/trapping in the area. While a trapping closure went into effect in 1985, hunting restrictions were not obtained. The refuge has negotiated with ADF&G to propose hunting restrictions to the Alaska Board of Game for two years but, as 1986 closed, no restrictions were forthcoming. In the interest of public safety, the refuge administratively closed the area surrounding the visitor center to hunting and trapping.

As though to reinforce the refuge's efforts, the Kenai Peninsula Borough in 1986 released a study called "Economic Impacts of Tourism on the Kenai Peninsula," which identified a major deficiency of the Peninsula as a lack of opportunity to view wildlife. The study suggested setting aside an area with "observable wildlife" to enable visitors to see wildlife and confessed that "no areas of the state except Denali Park offer assurance that major wildlife species can be observed". That a major study would advocate developing a commercial wildlife park in an area where 75% of the land is designated as a national wildlife refuge, strongly suggests that the refuge's past management strategy needs to be examined.

While Kenai has no designated wildlife viewing area, numerous wildlife/wildlands observations occur along refuge roads, water routes, and backcountry hiking trails. Primary access to the refuge is by state and refuge roads so annual traffic volume reports are used as one measure to determine wildlife/wildland observation numbers. The most recent (1985) annual traffic volume statistics for refuge roads are indicated in Table 33. These figures represent a 2-5% increase in average daily traffic.

Table 33. Annual Traffic Volumes and Daily Averages, 1985

Annual Traffic Volumes (1984)	Average	
	Daily Traffic	Annual
Sterling Highway (Approx. Watson Lk)	1,900	693,500
Sterling Highway (Junction Russian River Campground)	2,050	748,250
Skilak Rd-Sterling H.-L. Skilak Cpg.	115	41,975
L. Skilak-Upper Skilak	115	41,975
U. Skilak-Hidden Lk Road	120	43,800
Hidden Lk Rd-Junc./Skilak L. Rd.	200	73,000
Hidden Lake Road	85	31,025
Lower Skilak Campground Road	70	25,550
Upper Skilak Campground Road	70	25,550
Swanson River (Refuge Boundary)	195	71,179
Ski Hill Road	105	38,325
Tustumena Campground Road	65	23,725

Note: The above includes vehicles traveling both directions.

12. Other Wildlife-Oriented Recreation

Refuge management of the Kenai River will become more complex with the increasing influence of the Alaska Division of Parks. The final Kenai River Special Management Area Plan was completed during 1985 after refuge staff comment. While some jurisdictional problems and questions remain, refuge interests for all aspects of Kenai River management have been carefully included within the plan.

The Kenai River Special Management Plan and subsequent regulations affected several major changes regarding boating during 1986. The upper Kenai River drift area became effective as Alaska Department of Natural Resource regulations took effect in May and refuge drift-only regulations in September. The upper Kenai River has become an increasingly popular drift-only and bank fishing area and the new regulations will enhance these activities.

Alaska Division of Parks and refuge personnel installed signs depicting the "drift only area" boundaries both above and below Skilak Lake on the Kenai River including an area closed March 15-June 15 to protect Trumpeter Swans.



Alaska State Parks's personnel Walt Ward (L) and Dave Kenagy install a sign indicating new joint Parks and refuge regulations on the Kenai River as ORP Rick Johnston "supervises". MB

A controversial State regulation restricting outboard motors to 50 horsepower in 1986 and 35 horsepower in 1987 became effective on the Kenai River despite court challenges.

Reestablishment of refuge regulations for motor boats in 1986 dramatically affected recreational boating on the refuge. Federal or State horsepower or "no wake" limits are now in effect on all refuge rivers and lakes except Hidden, Stormy, Skilak, and Tustumena lakes and Kasilof River. Also non-compatible boating uses such as airboats and hovercraft have been prohibited from refuge waters.

13. Camping

An estimated 72,000 overnight visits occurred within refuge campgrounds or access areas during 1986. An additional 50,000 overnight stays occurred at non-developed and backcountry camping locations.

A cabin management plan was begun in late 1986. The refuge has from 6-12 cabins that are suitable for public use with a little maintenance. Until now, cabins have been available on a first-come, first served basis. While this minimal management approach has been inexpensive,

problems have arisen including illegal commercial use of cabins, persons (mainly trappers) virtually living in cabins and, due to a lack of accountability, incidents of vandalism. Persons planning trips to these cabins could never be assured of their availability since there is no reporting/reservation requirement. Those who wanted information on certain cabins had little to pick from since little documentation was available.

The KCCP calls for up to 12 public reservation cabins to be refurbished. The cabin management plan will initially rehabilitate the 6-8 that are in best condition. Due to the lack of management in the past, virtually all cabins are in need of remedial maintenance to correct health or safety deficiencies. Initiating a reservation system, similar to those used by BLM, NPS, or at Kodiak NWR, will provide greater accountability for these refuge resources on the part of management as well as visitors. If we didn't have any cabins, we'd probably never build them. But it is a disservice to further neglect these half-dozen examples of Alaska's heritage and deny them to visitors with the enthusiasm to reach them. It is hoped the Cabin Management Plan can be implemented by the summer of 1988.



The Finger Lakes cabin (top) and the Emma Lake cabin will be two of some half-dozen recreation cabins available on a reservation system.

DKK



Several new refuge regulations became effective in September 1986, which greatly influence camping. These include direct changes to camping limits and indirect changes which affect visitor behavior while camping. Changes are as follows:

1. Camping limit changed from 14 days to no more than 14 days in 30 anywhere on the refuge. In other words, this means that in any 30-day period a visitor may not use refuge lands and campgrounds more than 14 days. Previously, persons could leave for one day after a 14-day stay and return for another 14 days.

2. Camping within 1/4 mile of Ski Hill Road, Skilak Road, and the Sterling Highway is prohibited except in designated campgrounds. This regulation encourages persons to use designated refuge facilities in high-use areas. This will prevent sanitation problems, "pioneered" sites, unauthorized vehicle use, and unsafe campfires.

3. Within developed campgrounds, camping is permitted only in designated areas and open fires are permitted only in Service-provided fire grates or portable, self-contained, metal fire grates. This regulation will prevent campground congestion, enhance camping experiences, reduce wildfire hazards, and prevent surface impacts.

4. Campers may not spend more than two consecutive days at the Kenai-Russian River access area, more than seven consecutive days at Hidden Lake campground, or more than seven consecutive days in refuge shelters (cabins). This will maximize individual visitor use of refuge camping opportunities and prevent problems associated with long term trespassing in refuge cabins.

5. Pets in developed campgrounds are permitted only on a leash no longer than nine feet. This regulation enhances public safety and protects wildlife from uncontrolled dogs.

Substantiation of the refuge's historical use of the Russian River ferry/campground prior to 1975 was submitted to BLM to refute a native group's historical right to the area. Time will tell whether Alaska's most popular salmon stream stays under jurisdiction of the refuge or is assumed by Cook Inlet Region, Inc. (CIRI).

RM Doshier met with Messrs. Doebel, Mazzoni, Rogers, Schmidt, Deters, Hiller, and Gail Baker to decide the FWS' position on the native selection of the 14h(1) site on Russian/Kenai River on December 23. FWS will request a 17B easement to afford public access to the popular Russian River sockeye salmon fishery, but will not contest the 93 acre 14h(1) site. Only the existing access road to the refuge campground/ vehicle parking and existing trail adjacent the Kenai and Russian Rivers were identified consistent with current easement regulations.

15. Off-Road Vehicles

Snowmobiling was a lost opportunity for 1986, with the 1985-86 snowmobile season never opening due to inadequate snow conditions. Snowmobilers generally complied with the discontinued season; however, certain snowmobiling occurred on frozen rivers and within the Caribou Hills alpine areas. A double fatality accident involved a snowmobiler towing two teenagers on the Moose River. The youths were towed in an old skiff which collided with a log in the ice. The refuge was not open to snowmobile use but no citations were issued for this or other snowmobile violations due to a lack of access regulations until September. When the new snowmobile regulations became effective in September they reestablished the previous restrictions as well as closing several new areas.

A snowmobile handout and map were developed in October, summarizing open and closed areas and new regulations. Closed areas are as follows: (See appendix for complete snowmobile regulation handout and map)

1. Swan Lake and Swanson River Canoe Route areas (old closure).
2. Skilak Lake Wildlife Recreation Area (new closure).
3. Headquarters/Ski Trail area (old closure).
4. Alpine areas (slightly modified boundary).
5. ANILCA refuge addition alpine areas (new closure).

Three-wheeled ORV's continue to be popular on the Kenai Peninsula and accounted for several Violation Notices or warnings during 1986.

Refuge inholders on Tustumena Lake also were able to obtain limited permission to use ORV's within designated wilderness on or along a special winter route. Such authorized use has in the past encouraged unauthorized ORV use within the same locality and will need to be monitored carefully.

The most prevalent unauthorized three-wheeler use continues to occur on the ice of Moose River upstream from the refuge boundary. A prominent refuge sub-entrance sign and "No three-wheeler" signs were posted at this boundary during the fall of 1986 to alleviate the problem.

Although aircraft are not an off-road vehicle, they provide backcountry access within Kenai National Wildlife Refuge. In addition to F.A.A. regulations and advisories, Kenai NWR had comprehensive aircraft regulation prior to 1980 when existing regulations, in the solicitor's opinion, became ineffective. In recent years aircraft operation has been virtually wide open.

In September 1986, aircraft regulations took effect after publication in the Federal Register. Refuge staff developed an interim handout explaining the new regulations which reinstituted historical aircraft use while establishing several new aircraft policies. The regulations were developed based on the KCCP and a resource analysis completed in 1985.

Under the new policy only certain lakes in the Kenai Wilderness are open to aircraft. In the past, most lakes were open except for several closures. Also, the new policy addresses unlicensed aircraft (ultralights) and prohibits their use without a permit, prohibits landing on most rivers, and prohibits all aircraft operation on lakes with nesting trumpeter swans and/or their brood. The new program also clarifies landings within the new additions to Kenai NWR and describes which refuge locations are authorized for wheel landings (See Appendix for complete aircraft map and regulations).

17. Law Enforcement

Kenai NWR ended the year with five uniformed officers who logged approximately 2,500 patrol hours during 1986. While refuge patrols, visitor assists, and officer/visitor contacts continued to be high, Violation Notices again decreased during 1986. A decrease in cases is attributed to several factors:

1. The lack of enforceable access regulations until September 1986, prevented citations from being issued for most aircraft, snowmobile, and motorboat infractions.
2. Warnings were given for most parking violations at Russian River rather than Notices of Violation.
3. Special Agent Wally Soroka did little enforcement work on Kenai NWR during 1986.
4. Salmon snagging patrols were conducted primarily by State officers.
5. More warnings were issued during 1986 rather than Notices of Violation.

Although fewer Notices of Violation were issued again during 1986, officers responded to an increased number of incidents and regulation infractions (Table 34).

Table 34. Violations on the Kenai National Wildlife Refuge for years 1979 through 1985.

Violation	'79	'80	'81	'82	'83	'84	'85	'86
Snagging of fish	--	--	27	24	26	23	10	1
Fishing in closed water	--	--	13	4	13	4	3	3
Overlimit of fish	--	--	3	3	6	3	4	1
Fishing without a license	3	6	12	4	1	1	2	1
Other fishing violations	--	--	--	--	7	4	2	0
Snowmobiling violation	1	0	0	4	6	2	0	0
Motor boat in prohibited area	1	0	0	0	0	0	0	0
Unauthorized use of motor vehicle	4	11	7	10	9	20	28	15
Parking in No Parking Zone	21	15	19	13	2	12	2	0
Dropping objects from airplane	1	0	0	0	0	0	0	0
Lndg aircraft in prohibited area	4	4	1	4	6	0	0	0
Shooting fireworks/selling	1	0	0	1	4	2	2	0
Target shooting/weapons vio.	--	--	--	--	--	--	2	6
Violation of State game reg.	1	1	3	0	1	1	0	0
Migratory Bird hunting violations	--	--	--	--	10	2	2	1
Littering	0	0	5	0	3	2	3	4
Illegal camp/boats/cabin	0	9	3	1	0	0	0	2
Unauthorized advertising	0	1	0	0	0	0	0	0
Illegal wood cut/cut green trees	0	3	3	4	5	2	9	3
Speeding	0	0	1	0	5	3	0	2
Reckless operation of machine	0	0	1	0	0	0	0	0
Unattended fire	0	0	1	0	0	0	0	0
Interference with employee	0	0	1	0	0	0	0	0
Destruction of Gov't property	0	0	0	1	0	0	0	0
Failure to comply with refuge SUP	0	0	0	1	2	2	2	1
Violation of Coast Guard Reg.	--	--	--	--	5	0	0	0
Violation of other Refuge Regs.	--	--	--	--	--	--	2	1
Unauthorized trap/vio/trap permit								4
Interference/public/theft								1
Totals	37	50	100	74	111	83	74	46

Volume of incidental reports increased during 1986, due to increased record keeping accuracy, increased percentage of warnings and actual increases of incidents. Of particular note are increased assists to visitors involving injury, assists to visitor not involving injury, and assists to officers of the Alaska Department of Public Safety (Table 35).

Table 35. Kenai NWR incidents (Nov-Nov) 1985/1986.

Incident/Violation	Number of Incidents	
	1985	1986
Low flying aircraft	8	14
Violation of a refuge SUP	8	4
Vandalism	10	22
Altercation/disturbance	2	9
Theft	4	12
Drunk and disorderly	1	1
Unattended or abandoned property	6	5
Unauthorized taking of wildlife/injured wildlife	4	34
Violation of trapping permit	5	5
Violation of wood cut permit	8	1
Assist to public involving injury	3	16
Assist to public not involving injury	0	26
Unauthorized use of motor vehicle	16	15
Coast Guard violation/boating	30	10
Animal trespass (grazing)	2	1
Unauthorized cutting green trees or timber removal	9	9
Unauthorized fireworks	4	1
Unauthorized parking/blocking refuge road or facility	40	29
Target shooting/unauthorized use of firearms	6	17
Search and rescue	3	6
Drowning	2	0
Miscellaneous fishing violations	9	9
Unattended fire/wildfire/unauthorized fire	3	14
Disposal of waste/littering	8	10
Other refuge regulations	1	16
Assist to AK State Troopers/traffic accidents	8	18
Assist to AK Fish & Wildlife Protection Officers	15	18
Miscellaneous traffic violations		1
Bear baiting permit violation		4
Bear encounter		6
Aircraft violation		3
Assists to Fish & Wildlife Agents (Off-refuge)		5
	220	341



SORP Boylan (R) with a black bear that was relocated after it visited a refuge campground. WS

Moose hunter check stations operated at Swanson River Road from September 1-8 and 13-14, Mystery Creek Road September 1-8, and Marathon Road September 1 and 2. Refuge law enforcement staff assisted State Fish & Wildlife Protection officers in investigating seven violations regarding moose and three violations involving other big game species during September. Refuge officers and seasonals logged 280 patrol hours during moose season in addition to check station operation. Preventive enforcement was significant in 1986 with high visibility LE vehicles in use during the entire year.

As discussed previously, Kenai went most of 1986 without access regulations. In mid-September, new regulations became effective that should provide a comprehensive regulatory program for the future. The regulations were published in the Federal Register August 26, and became effective September 11, 1986, during the moose season. News releases and subsequent newspaper articles got the message out quickly. Initial access regulation violations were handled primarily by warnings. Compliance with new regulations was quite good considering no regulations had been in place for several years.

Several non-Federal regulatory changes also significantly influenced use on Kenai NWR during 1986. Illegal use of fireworks was down dramatically during 1986, due to a new Kenai Peninsula Borough ordinance prohibiting sale of fireworks. Also, several State Kenai River Special Management Area regulations such as a maximum horsepower limit of 50hp, drift-only areas above and below Skilak Lake, and guide requirements positively influenced wildlife protection and visitor safety. Kenai River State Park Rangers logged many patrol hours on Kenai NWR portion of the Kenai River Special Management Area.

Five seasonal Park Rangers handled much of the regulation compliance and enforcement program in 1986. Some 60% of all visitor assists, Violation Notices, and incident reports, involved seasonal employees. Although FWS could commission seasonal employees in 1986, the one seasonal initially selected as a commissioned officer elected to stay with State Parks.

The 1985-86 trapping program received a great deal of attention from enforcement personnel. Compliance with the new trapping permit was generally good; however, a total nine Violation Notices and warnings were issued during the year. There were also other incidents of unmarked snares catching non-target wildlife or being left after the trapping season. The new requirement that identifies traps with a permittees' tag dramatically helped compliance and insured trappers were accountable for their traps. Trapping enforcement continued during early winter of 1986 for the 1986-87 trapping season. Overall compliance appeared to be improved from 1985-86 although several illegal trapping incidents were investigated during November and December 1986.

The burning of a refuge pickup on July 12, resulted in the arrest of John L. Cook, 23, of Sterling, AK. The refuge vehicle was parked in a State campground while two refuge employees were on a two day backcountry trip. A window was broken and gasoline poured into the interior and set afire. Campers saw a person fleeing the scene with his arm on fire. Campers put the blaze out and notified authorities. Later that morning while State troopers were investigating, two men drove by and one, Cook, was identified by the campers. Cook was arrested for vandalizing the refuge pickup and the other man was arrested for driving while intoxicated. Damage to the truck was estimated at \$1567. Cook was ordered by the court to make restitution, and we are still attempting to obtain the money from him.

18. Cooperating Associations

The refuge's Alaska Natural History Association (ANHA) sales outlets experienced a surge of sales growth in 1986 with a final tally of \$18,288.63, an increase of almost \$5,000 over 1985 sales of \$13,358. This 27% increase is a result of expanding the variety of sales items offered at our outlet, keeping inventory well-stocked, and maintaining a cordial relationship with the Kenai and Soldotna Chambers of Commerce who referred travellers to our visitor center.

Visitation to Alaska increased dramatically in 1986 and the Kenai Peninsula felt the impact. The refuge's Sterling Highway log cabin visitor contact station experienced increased visitation. During the Memorial Day to Labor Day period 6,644 people visited the VCS and sales rose to a new high of \$3,712.64.

Our year round Soldotna visitor center experienced growth from approximately 25,000 visitors in 1985 to 28,000 in 1986. Sales proceeds totalled \$14,575.99. The local Chambers of Commerce provided excellent referrals to the center which helped overcome access problems that make it so difficult for first-time visitors to find. With a good access road, it is anticipated visitors center attendance would increase by as much as 50%.

New sales items included 5 full-color wildlife postcards featuring Dall's sheep, caribou, brown bear, moose, and wolves photographed by Kennan Ward and Steve Kauffman. In addition to postcards, two colorful enamel collector's pins were developed of an eagle and a moose. These projects promoted wildlife appreciation and helped to develop refuge recognition by the public.

Proceeds from cooperating association sales were used for awards to volunteers, honorariums for outstanding volunteer contributions, resource books for the refuge library, and to support teacher training.

19. Concessions/Special Use Permits

There were 36 Outfitter/Guides and 1 concession operating on Kenai NWR during 1986.

Four new Special Use Permits (SUP) were issued during 1986 to Ozzie's Guide Service, Osprey Outfitters, Hansen's Guide Service, and Voyageur Charters and Excursions. Previous permittees, including Blood and Guts Packing Service, Northwest Outfitters, Solid Rock Bible Camp, St. Theresa's Camp, and Air Cushion Guides did not renew their SUP's.

Special Use Permits are issued on a case-by-case basis with a freeze on permit issuance on only the upper Kenai River and semi-permanent tent camps. All other areas of interest to outfitter/guides seem to be relatively dispersed with restrictions unnecessary at this time. The new involvement of the Alaska Division of Parks and their Kenai River Guide requirement have lessened guide concerns on refuge portions of the Kenai River below Skilak Lake and Sterling, Alaska. Guide use of these sections of the refuge is generally intermittent and associated with the Kenai River use in general. A cooperative program for permitting the guides will be developed in 1987.

The refuge's first concession contract was issued to Sportsman's Lodge, Inc. to operate the popular Russian River Campground during 1986.

Big Red's Flying Service was informed, for the second year in a row, that Trumpeter swans had nested on Two Island Lake and consistent with their SUP, they must discontinue the camp. If swans nest at Two Island Lake during 1987, the camp will be permanently moved.

Ketchum Flying Service was informed that they could not use Scenic Lake camp during 1986, due to nesting Trumpeter swans. Ketchum's was given the option of moving to McLain Lake and disbanding the Scenic Lake camp, or waiting until 1987 to see if the swans nested again. During the fall of 1986, Ketchum disassembled the Scenic Lake camp and took steps to move it to the west side of McLain Lake.

The parking concession was operated by Robert Haglund dba Pacific Coast Charters and Sportsman's Lodge, which Haglund managed. The concession operations was initiated to release the refuges limited personnel from collecting parking fees. The fee collection (with none of the funds returning to the station) required separate fee envelopes and receipt forms and was an accounting nightmare for refuge staff. Collecting fees normally required the time of two Park Rangers assisted by a Student Conservation Association (SCA) volunteer.

With limited staff and no incentive to collect fees and they weren't returned to the station, the concession contract went into effect June-August. The concessionaire's fee scheduled was reduced three times. At season's end 1986 the parking area collected \$37,370 from an estimated 8,000 vehicles of which the government received 3% or \$1,121. The previous year the area collected \$12,600 for to the general fund. The 300% increased in revenues reflects a similar increase in fees. The \$2.00 fee of 1985 had not been charged since 1979. While late in the season the concessionaire lowered fees to \$4.00, for much of the season they remained at \$6.00 per day, hence the increase.

The complaints generated by the fee hike were substantial, mainly from locals who were accustomed to a \$2 daily fee, some of whom didn't pay anything since the refuge had insufficient personnel to staff the fee both.

In his year-end report, the concessionaire agreed to maintain a \$4 daily fee for 1987 which will reduce complaints. A free one-half hour pass will be retained as will 50% seniors discount.

The Russian River is Alaska's (and Kenai's) first refuge concession. It has a 3-year contract. Hopefully, by that time legislation returning such fees to the station to defray the cost of maintaining the area will have been passed. As it is, our chronic staff shortage requires us to use our limited personnel for resource protection and public safety duties rather than parking lot attendants. If even a portion of the fees would return to the station, we could operate the Russian River on a self-sustaining basis.

Interest in obtaining outfitter permits for the upper Kenai River remained high during 1986 (Table 36). Most applicants were interested in sport fishing on days when lower Kenai River regulations do not allow guides to fish. Increased use by outfitters of "McKenzie River" drift dories have added to the upper river's popularity.

Table 36. Special Use Permittees and Categories of Service, 1986.

<u>AIR TAXI/</u>	<u>BACK PACKING/BACK COUNTRY</u>
<u>DESTINATION TENT CAMPS</u>	<u>CANOE GUIDE SERVICE</u>
Alaska Air Guides Alaska Bush Carriers Big Red's Flying Svc. Ketchum Air Service Rust's Flying Service	AK Fishing & Wilderness Adv. AK Outdoor Services AK Pioneer Canoeing Assn. Frontier River Safaris GreatAlaska Fish Camp Hugh Glass Back Packing Kenai Guide Svc.
<u>EQUIPMENT RENTAL</u>	
AK Outdoor Svcs. AK Pioneer Canoe Assn. GreatAlaska Fish Camp	<u>GAME MEAT TRANSPORTING</u>
<u>HORSE PACKING GUIDE SVC.</u>	AK Outdoor Svcs. Hope Trading Post Jones Guide & Outfitting Svc. Running W Outfitters Willard's Moose Lodge Voyageur Charters & Excursions Voyageur Charters & Excursions
Jones Guide/Outfitting Svc. Running W Outfitters Willard Moose Camp Hansen Outfitters Hope Trading Post	<u>RIVER FLOAT TRIPS</u>
<u>SCHEDULED BOAT SVC.</u>	AK Fishing & Wilderness Adv AK Pioneer Canoe Assn AK River & Ski Tours, Inc. AK River's Co. Osprey Outfitters Ozzie's Guide Service
Sportsman's Lodge, Inc.	
<u>KAYAK INST. & GUIDE SVC.</u>	<u>HUNTING/OUTFITTER GUIDE SVC</u>
AK River's Co.	AK Outdoor Svc. Hope Trading Post Jones Guide&Outfitting Svc. Kenai Guide Svc. Dennis Owen Guide Svc. Running W Outfitters Voyageur Charters & Excursions Willard's Moose Lodge
<u>LAKE/OCEAN TOURING</u>	
AK Outdoor Svcs. AK Pioneer Canoeing Assn. GreatAlaska Fish Camp Hugh Glass Backpacking Kenai Guide Svc. Pacific Coast Charters AK Fishing & Wilderness Adv.	<u>PHOTOGRAPHY GUIDE SVC.</u>
<u>SPORT FISHING GUIDE SVC.</u>	Kenai Guide Svc. Hugh Glass Backpacking Co. AK Fishing & Wilderness Adv. AK River & Ski Tours Hope Trading Post
AK Air Guides AK Bush Carriers AK Drift Boaters AK Fishing & Wilderness Adv. AK North Flying Svc. AK River & Ski Tours AK River's co. B & B Guide Svc. Big Red's Flying Svc. Johnnie's Guide Svc. Kenai River Chargers Ketchum's Air Svc. Bruce Nelson Float Fish Svc. Ozzie's Guide Svc. Pacific Coast Charters Randa's Guide Svc. Rust' Flying Svc RW's Guide Svc. Silver King Charters Sportsman Lodge, Inc. Voyageur Charters&Excursions	<u>WINTER BACKCOUNTRY GUIDE SVC.</u>
	AK Outdoor Svcs. AK River & Ski Tours Kenai Guide Svc.
	<u>COMPETITIVE EVENTS</u>
	Peninsula Sled Dog Racing Assn.

The year 1986 was the first season of entirely non-motorized use of the upper Kenai River although guides themselves had been non-motorized during 1984 and 1985. The prospect of the upper river offering a high quality fishing experience also increased the popularity of the area.

During April, 1986, 12 permits were issued for the upper Kenai, all of which authorized sport fishing. Three of these permit holders offered separate white water or scenic float trips, in addition to sport fishing trips (Tables 37 and 38).

Table 37. 1984-1986 Special Use Permit Chart.

	1984		1985		1986	
	<u>Parties</u>	<u>Clients</u>	<u>Parties</u>	<u>Clients</u>	<u>Parties</u>	<u>Clients</u>
Consumptive Fishing	(11 Permits) 220	597	(13 Permits) 183	581	(12 Permits) 228	580
Non-Consumptive Scenic/Float	(3 Permits) 140	950	(3 Permits) 159	1299 (Includes Overnight)	(5 Permits) 211	1239 (Includes Overnight)

Table 38. 1986 Sportfishing Permittee Visitor Use Profile.

Five permittees had less than 10 annual starts and 20 visitor days per permit (Angler Days).

Three permittees had less than 50 river float starts and 100 visitor days per permit (Angler Days).

Three permittees with less than 100 float starts and 200 visitor days per permit (Angler Days).

A moratorium continued on issuing new permits for the upper river and as the waiting list of prospective sport fishing permittees grew many outfitter/guides grew more vocal. Refuge staff continued to analyze upper Kenai River objectives, existing visitor use, and management options at year's end in an effort to decide on the management program for 1987.

I. EQUIPMENT AND FACILITIES

1. New Construction

To help alleviate a perennial problem of insufficient storage, we enlisted RO Engineering to design a high load, elevated shelf along nearly the entire length of the 8-stall vehicle storage building. This 82' x 8' deck will not only permit more orderly storage of accumulated clutter, but will actually permit us to use the building for its intended purpose. Although initiated in 1986, project completion is scheduled for spring of 1987.

An approximate 200' x 200' area behind the carpentry shop was cleared, landscaped and graveled in an effort to improve and expand our extremely limited on-ground storage capability within the maintenance compound.

The 40' x 50' Carpentry shop, completed in late 1984, was again put to good use in meeting our sign maintenance-construction commitments. A number of wood routed signs were constructed to replace vandalized and/or stolen signs. Perhaps our signs are too attractive as the theft rate was higher in 1986 than any previous year. Routed informational signs were also made for the Aleutian Islands Unit of the AK Maritime NWR and the Arctic NWR. The refuge's capability to produce high quality routed signs, not only for this station, but other refuges within the region as well, is severely restricted by our perennial shortage of FTE's. At present, we are attempting to meet commitments within our existing seasonal and permanent work force, but are far from fully utilizing our excellent sign-making facilities and equipment.



The 40 x 50 refuge carpentry shop has been a real asset in meeting not only our own routed sign needs, but also those of several other Alaska refuges in 1986.

JF



Donna Bartman, putting her wide-range of wood working skills to use fabricating a refuge sign. Donna's sign making and carpentry talents have been a real asset to the refuge maintenance program.

JF



FMO/Pilot Bill Larned attaches a new sign designating one of the refuge's recreation cabins. JF

Two new steel gates were fabricated, one for the Sterling Highway entrance to Mystery Creek and the other to prevent public access into a state gravel pit at Mile 63 of the Sterling Highway. Several other access points along the Sterling Highway were barricaded in an attempt to reduce illegal trespass. The advances in custom designed, high clearance 4 x 4 pickups seems to keep at least one jump ahead of our barricade-making ingenuity.

An 8' x 16' wooden frame fire cache was constructed for storage and consolidation of all fire fighting equipment.

EO Dick Kivi constructed 10 metal framed crates for holding-transporting caribou from Lake Louise to Kenai. The design was patterned after crates used by Eskimo reindeer herders on the Seward Peninsula. With larger dimensions, the crates proved extremely valuable in eliminating the high mortality experienced during transportation in 1985. The crates were also designed for loading, nine at a time, in a Bell 205 helicopter. This also worked to perfection as no mortality occurred during the flight portion of the transport operation.

EO Kivi and MM Al O'Guinn constructed a hanging bracket for the new Sony ceiling-mounted video projector in the auditorium. The bracket allows multi-axis adjustments in meeting extremely critical tolerances in proper focusing. The Sony field representative paid them a fine compliment in stating that the unit far surpassed their factory made product in both quality and function, plus being considerably less expensive.

A new 36" culvert was installed on the Swan Lake Road just north of the Outdoor Education Center. This low spot has been a perennial problem area, especially during spring breakup.

2. Rehabilitation

The old culvert-type fire grates were replaced in all campgrounds with steel circular grates with lift-up grill. The culverts, installed in the late 1970's had essentially become useless as grills due to several years accumulation of cans, bottles, tire rims, hubcaps, etc.

A number of old barrier posts were removed from Hidden Lake Campground and in the parking lot at the Visitor Contact Station. New 8 x 10 x 10' barriers were installed at the Contact Station in order to redirect the random and haphazard vehicle parking which had evolved over the years.

Our new 5' Cartner brush mower was finally put to the test on alder growth along the Swan Lake Road. This hydraulically operated unit was mounted on our JD 300 tractor, and modified specifically for this purpose. With dual rear wheels (outside duals filled with calcium chloride) the stability is quite good although the unit is a bit smaller than desirable.



EO Dick Kivi with our new 5' Cartner brush hog on Swan Lake Road.

JF



Before and after pictures of Swan Lake Road clearing project using our 5' hydraulic Cartner brush mower. JF



A number of wooden routed signs, picnic tables, and bulletin boards were brought into the Carpenter Shop for repair, repainting, and general maintenance.

3. Major Maintenance

Considerable maintenance effort was expended converting our old 1974 GMC Compactor unit to a utility maintenance truck. A new 6 bin, 8-foot utility bed was fabricated by a machine shop in Anchorage, and then fitted to the GMC frame. Both were sanded, primed, and painted. This unit will greatly increase efficiency in campground operation and maintenance activities by consolidating materials, tools, and supplies in a single vehicle. MM O'Guinn is to be commended for a professional job in making this conversion.



MM Al O'Guinn with his "born again" 1974 GMC. The old garbage compactor was reconverted into a maintenance utility truck. Al is to be commended for an outstanding job.

JF

Redwood lap siding on the refuge office/visitor center was re-screwed to the plywood underbase. The siding was originally stapled, but expansion and contraction, primarily on the sun-exposed south and west sides, began pulling the staples from the plywood base.

The internal fire alarm system in the office/visitor center, a headache since installation in 1979, continued to perplex even expert troubleshooters. We are now convinced that nothing short of a complete rewiring of both upper and lower level detection devices will solve the problem. The sprinkler system is still operational; however, we have no internal alarm capabilities. There is little point in spending any more money on the alarm system, especially since it's not tied to a remote monitor at the local fire department. They would not respond anyway, since we are not within the designated fire service area.

Ben Chio, of the WO, and George Ziots, of the RO, were here the entire week of June 23, to assist (in a workshop format) with the building inspection phase of the new Maintenance Management System. Most of the refuge buildings were given a thorough evaluation during their visit. Their assistance and consultation were much appreciated.

EO Kivi spent several days assisting YCC in rehabilitating the popular Fuller Lakes trail system. Steps were installed at the trailhead parking lot as well as sections of boardwalk across wet areas.

A 10' section of 48" culvert was added to existing culvert at Sucker Creek in an attempt to permit salmon smolt movements from the creek, through the perched culvert, and eventually into Sucker Lake. The new section, with welded baffles did not achieve the desired results, so another attempt to correct the situation will take place in 1987.

4. Equipment Utilization and Replacement

As though normal wear and tear weren't enough, a Dodge crew cab was damaged when it was intentionally set afire by an arsonist who mistook it for a State Park vehicle when it was parked overnight in a State park. Although the vehicle suffered \$1,500 in damage, we continue to use it (see LE section).

One of our old vets, a 1968 4 x 4 International Carry-all was replaced with a 1986 4 x 4 3/4 Ton Dodge Ram pickup. Ten other vehicles (pickups, Bronco-Blazer types, and a 15 passenger van) were ordered this year, and hopefully will arrive prior to the busy summer season in 1987. The 15 passenger van (for YCC) will be a new addition to the vehicle fleet. While others will be replacements for older, high mileage vehicles.

The seven 4 x 4 Chevy S-10's continue to provide low cost, reliable transportation. Total fleet mileage in 1986 was approximately 170,000 miles, with the S-10's accounting for approximately 54% or 94,500 miles. While the S-10's accounted for over half of our total fleet mileage, they represented less than 25% of total fleet expenditures (maintenance-fuel). Overall cost per mile for the S-10's was \$0.085, or about one half the total fleet average.

Three vehicles were leased from GSA to support the YCC program and to help meet summer vehicle shortages. Total cost for the three vehicles was \$1,780 (mid-May - mid-August) for a total cost of \$0.43/mile.

New equipment purchased in 1986 included a Play-Mor camper trailer for Check Station/remote field camp use; three E-Z load boat trailers; Prime Mover tractor ("Bobcat") and trailer; and two 4,000 watt gasoline powered generators. Other items included a 24" double drum sander for the Sign Shop, three Zodiac inflatables, a 2.5 hp outboard, and a 12' Falls snow wing for our Cat 130 grader.



"Little Brother," the newest addition to our equipment fleet -- a 3-cylinder diesel powered Prime Mover. JF



The new 12' Falls snow wing was a welcome addition to our Cat 130 grader in 1986. JF

Several old vehicles, a D8 Cat, and Minneapolis Moline tractor were excessed and will be sold in 1987.

MM O'Guinn replaced a number of worn parts on our WWII vintage South Bend machine lathe, and the unit can now be used for jobs requiring extremely high precision.

The main bearings in the roto-phase converter had to be replaced during the year. Hopefully the four three phase electric motors in the headquarters building can be replaced with single phase units in 1987, thus eliminating the need for the roto-phase altogether.

5. Communications Systems

In 1986 we purchased a new telephone system for the headquarters for \$5786. Our old system was leased from the local phone company and the rental and local service paid each month had increased from \$559 to \$778.40 between 1982 and 1986. This purchase has resulted a monthly savings of \$562.

Thirteen Kenwood mobiles and ten portable programmable King radios were purchased this year. These are replacements for radios purchased in the early 1970's. The programmable feature on the King radios will be used when frequencies for State Forestry and BLM are needed during the fire season.

6. Computer Systems

During 1986 BA Leslie Blaylock spent approximately 250 hours working on the new Field Financial Tracking System program with the RO Information Resource Management Programmer Julie Miller. Julie wrote this software program for use on the Data General 10SP located on many field stations. This financial tracking system was written for stations to track their budgets. In September 1986, the program was completed. Leslie assisted in training all field station personnel from Refuges, Fisheries and Habitat Resources. Due to the large number of participants three training courses were held, one in Fairbanks and two in Anchorage. This new program is a definite plus for field stations who were tracking their budgets using "cuff records".

We have saved several hundreds of dollars because of this software program. Previously we were required to telecommunicate by long distance calls to the RO to update the RO tracking system. This was a very slow and unreliable method as many hours of work could be lost by a bad connection or a cutoff. We are now able to run a program to transfer all new information to diskettes and mail them to the RO for update of their tracking system.

There are some reports that the field stations would like to be able to produce and these are currently under review in the Regional Office. Several bugs were found in the program, as in all new programs, but Julie is working closely with the field stations to correct them.

Our Wang Professional Computer that was purchased as an archiving workstation to the large word processing system was put to use this year as a computer. We considered purchasing an IBM compatible computer to be able to run IBM compatible software. The Wang had a capability of this and all that was needed was an IBM emulation board and the IBM PC.DOS operating system software. This was purchased and now we are able to run the IBM compatible software.

Software purchased for use on the Wang PC was Lotus 123 and dBase III. We were unable to purchase this software for use on the Data General 10SP and the dBASE II that is on the Data General ties up all workstations while one individual works in dBase II.

A Visual 500 graphics terminal, a cartridge tape drive, and a disk expansion unit were purchased to attach to the DG 10SP for future installation of a geographic information software program in 1987. We needed the increased memory size because of the large sized map files in the geographic software. After receipt of the Visual 500 terminal Gretchen Bostwick from IRM came to the refuge to set the menus on the terminal to use it with the DG. After she left, we found every time we turned it on the menus had to be reset. After talking with Visual Technology we learned that the "save" board was out on a brand new terminal. We are now attempting to obtain the "save" board through the dealer.

An Epson HX-20 laptop computer was purchased for biological use this year. We are still attempting to install the EpsonLink application chip sent with the unit. The instructions told us that an Epson dealer should install the chip or it would void the warranty. Yet the dealer told us to install the chip. We installed the chip but the computer does not work, so now its back to the dealer.

7. Energy Conservation

Table 39 shows a comparison of energy consumption between calendar years 1985 and 1986.

Table 39. Energy Use Comparisons.

Product	Unit of Measure	Comparison		Comparison	
		1985	1986	% Change with 1985	
Electricity	KWH	147,651	158,334	+	7.2%
Natural Gas	100 Cu.Ft.	18,876	16,466	-	12.7%
Vehicle Gas	Gallon	12,066	12,515	+	3.7%
Aviation Gas	Gallon	9,413	8,089	-	14.1%
Propane	Gallon	354	492	+	38.9%
Diesel Fuel	Gallon	1,798	946	-	47.4%

The increase in KWH (7.2%) is primarily attributable to modifications made in the Maintenance Shop make-up air system. Three external exhaust fans were converted from timed switches to continuous operation in an attempt to improve air quality within the shop building. Another factor contributing toward the increase was the fact that the Carpentry Shop was occupied for a longer period of time than in 1985.

The drop in natural gas consumption (12.7%) was due to NPS taking responsibility for all energy expenditures at the old shop facilities in downtown Kenai.

The increase (3.7%) in gasoline consumption reflects increased mileage driven in 1986. Total fleet mileage for CY 1986 was 13.5 mpg.

During 1986, the refuge's Cessna 206 was flown 110 fewer hours than in 1985, thus accounting for the 14.1% decrease in aviation gas consumption. The decrease in 206 time from 407.5 hr. (1985) to 297.7 hr. (1986) was most likely due to Refuge Manager/Pilot Bob Delaney's transfer in February. Total time flown in the PA-18 was nearly identical for 1985 and 1986 - 261.3 hr. and 266.9 hr., respectively.

Although Table 39 indicates a 38.9% increase in propane, it is probably deceiving in that we received a delivery about the time we began vacating the Schooner Bend summer field camp. We will no doubt show a decrease in consumption of about the same magnitude in 1987.

The decrease in diesel fuel (47.4%) reflects reduced hours in snowplowing in 1986, and somewhat less time on campground road grading. Considerably more road work (gravel hauling, ditch pulling/shaping) took place in 1985 than in 1986.

J. OTHER ITEMS

2. Other Economic Uses

a. Oil and Gas:

1. Beaver Creek Oil/Gas Field (BCF) - Other than wireline work over wells 1A and 5RD, no new wells were drilled for the fourth consecutive year. Deliverability and pressure tests were conducted on the four Sterling gas wells, 1A, 3, 6, and 7. Average pressure of the Sterling Reservoir was calculated to be 1909 psi. The Sterling Gas monitor well #2 remains shut-in.

The BCF's six (6) producing wells include, four natural gas and two crude. Average daily crude production remained at 432 bbl/da. while gas was about 48,500 MCF/da.

Cumulative production through December 31, 1986 was:

3,335,694 barrels of crude (wells 4 and 5RD)
47,450,667 MCF dry gas (wells 1A, 3, 6, 7)

Natural gas produced is transported to the Alaska Pipeline Company transportation facilities for subscriber use in the Anchorage area. Produced crude is trucked about four times a week from Field storage tanks into 200 bbl tankers and transported to North Kenai refineries or sales.

2. Swanson River Oil Field (SRF) - Following nearly thirty years as Operator of the Swanson River Field, the oil field that paved the way for Alaska statehood, Chevron USA, Inc. on October 1, 1986, relinquished operating control of the Field to ARCO Alaska, Inc., as part of a nationwide reorganization forced by declining oil prices.

Swanson River Field's discovery in 1957 was the first commercial oil find on the Kenai Peninsula. The discovery provided a source of revenue for Alaska, helping convince Congress the territory had an economic base capable of supporting statehood. The Field is small by contemporary Alaska standards, but with more than 205 million barrels produced, it ranks as the fourth most productive in state history.

(a) Field Operations - Field production is maintained by formation pressures averaging nearly 4800 gpsi. A large compressor facility of 17 gas fired compressor units provides the necessary 38,000 H.P. to attain the 6,000 gpsi pressures required by nine strategically located injection wells. Average daily gas injection was 255,444 MCF/da.

During the year approximately thirty-two crude wells were under production at any time. Daily production averaged 5488 bbls/day; cumulative production through December 31, 1986 was, 205,271,026 barrels of crude. This cumulative total represents a recovery of forty-five percent of the estimated barrels of original oil in place.

Although remedial work was conducted on several wells within the Field, no new wells were drilled during the period. Shut-in well status was reviewed, certain wells reworked, and some wells returned to production. Nine wells were listed under temporarily abandoned status because of high gas to oil ratios, the others classified as uneconomical. Twelve wells were identified for possible abandonment pending an analysis of each. Wells abandoned will require restoration of all disturbed lands and possible surface gravel recovery for use as future needs require.

December 12, the refuge was notified by ARCO of a gas blow out at a well location (SCU 44-8) within the Field. ARCO immediately moved well blow out specialists and supporting equipment and personnel to the scene to address the real possibility of this becoming a very serious event.



A minor gas blow out within the Swanson River Field December 12, provided some anxious moments during the two weeks before problem well SCU 11-16 was arrested. RR

Fortunately, following two weeks of escaping gas at the well site and at gas seeps adjacent to and within the Swanson River 1/4 mile north, the problem well, then identified as SCU 11-16 adjacent to well SCU 44-8, was

"killed" early Christmas Day. Apparently, production tubing near the surface had ruptured permitting gas to enter the surrounding casing annulus and bypass the casing shoe downhole eventually reaching the surface at several locations.



The gas blow out first surfaced from the cellar of well SCU 44-8, depositing subsurface sands, produced water, and some crude around the well pad. RR.



Numerous surface gas seeps releasing pressures through lateral formations emerged along adjacent banks and within the Swanson River more than 1/4 mile from the SCU 11-16 well blow out. RR.



Escaping gas also produced water from surface aquifers removing and displacing local soils down gradient to leave some excavations six feet deep. RR.

(b) Polychlorinated biphenyls (PCB's) - The final shipments of soil samples collected within the Swanson River Field following the finding of Polychlorinated biphenyls (PCB's) within the Field in July 1984, were air freighted in January for analysis by Analytical Technologies, Inc. of San Diego, CA. More than 1,100 soil, water, and biological samples were collected and forwarded to specific labs for analysis.

On May 21, with all agencies signatory to the Order by Consent of April 6, 1985 in attendance (FWS, BLM, ADEC, USEPA, Chevron, and their contractor Ecology and Environment, Inc.), a meeting was held to discuss Chevron's Risk Assessment document conclusions and approve PCB cleanup standards for the Swanson River Field. This meeting, however, adjourned with no agreement on the cleanup standards. The assessment it was determined, required an expanded and much more detailed literature review with regard to recent data on wildlife and biological communities.

On July 2, the proposed Mitigation and Restoration Plan document to all signatory agencies was received. Agency representatives on August 15 again met at Anchorage to discuss and finalize Chevron's Restoration Plan for the cleanup of PCB's. The soil cleanup levels established required

the mitigation of all areas contaminated above 12 ppm, except for the Soldotna Creek Unit (SCU) 14-3 pit site (specifically the pit and stockpile), and a certain pipeway at the compressor plant facility. A clean-up level of 24 ppm was established for these excluded areas. Later, mitigation maps incorporating the cleanup standards agreed upon were developed.

ARCO Alaska, Inc., the new Field Operator, following their review in early November of the several plans, reports, and other supporting documents, accepted the entire package as approved by all agencies including the clean-up standards set by FWS.

ARCO executed the Memorandum of Agreement (MOA) which set the cleanup levels for the PCB contamination on November 14, 1986. ARCO also alerted the agencies to the potential need to extend cleanup activities into 1988 to secure permits and process the material should on-site treatment (incineration) be selected as the disposal method.

Although in July, Chevron had selected GA Technologies of San Diego to provide on-site incineration, that firm withdrew their proposal September 25. During December, a Request for Proposal (RFP) for the cleanup effort, a solicitation of interest request and questionnaire, was sent out to twenty-five (25) firms who had expressed interest in bidding on the project. This re-bid became necessary because of the withdrawal of GA Technologies before ARCO became Field Operator.

(c) Solid Waste Disposal Facility - The refuge approved an Environmental Assessment package prepared by Chevron for a proposed solid waste disposal facility to be located within the Swanson River Field. A FONSI was signed August 7, covering construction of the solid waste disposal facility for the Field. This new centralized facility will replace the 1971 existing SCU 14-3 site location no longer available to accept the disposal of non-hazardous solid wastes generated during normal oil field operations.

(d) Exploratory Activities - Chevron U.S.A. submitted a January letter request to conduct a 228 line mile gravity survey within the Kenai NWR. Review of the accompanying documents revealed 68 percent of the proposed program would include Congressionally-designated wilderness. Although this revised program would not use motorized equipment inside wilderness areas, helicopters, snowmobiles and a cabin cruiser were to be used on other refuge lands and waters. Survey and gravimeter crews during this operation would flag and record at more than 450 stations along nine different profile lines.

The staff originally denied Chevron's request within the Kenai Wilderness under the provisions of the Wilderness Act. This was based upon exploration as a prohibited commercial enterprise under the Act; not an approved program under Section 1010 of ANILCA; as well as, an understanding of the oil and gas leasing program authorized under Section 1008 ANILCA, where "Such program shall not be undertaken by the Secretary on those lands where applicable law prohibits such leasing...". Permits for study, certainly a major part of such program, would not be appropriate within these areas.

During February and March, pending their appeal of the Refuge Manager's decision denying a permit to conduct this activity in refuge wilderness, Chevron conducted a portion of their gravity survey using a helicopter on two lines outside the Kenai Wilderness. The Regional Director, in a April 30, 1986 letter to Chevron, reversed the Refuge Manager's decision stating, "It is my decision that Chevron's proposed activities do not constitute "commercial enterprise" as used in the Wilderness Act. Chevron has no intention of selling the data nor do they stand to profit directly from any resources within the wilderness."

A refuge permit was issued to Chevron to conduct this program in July and August within the Kenai Wilderness using horses in mature forest areas of the Benchland between Skilak and Tustumena Lakes. A helicopter completed the program outside wilderness areas. This gravity survey, both within and outside the Wilderness, was completed August 13 by the contractor, Photo-Gravity of Houston.

b. Other:

State Highways in Soldotna completed two summers' shoulder work along the Funny River Road. Last season large quantities of roadside material were dozed and recontoured, mostly within the right-of-way. Those disturbed shoulder areas were hydroseeded with State equipment in August.

3. Items of Interest

The following VIP's visited the Kenai National Wildlife Refuge during 1986:

During April a refuge overflight was provided to Paul Schmidt and Ted Heuer of the RO, and Dom Ciccone of the W.O. during discussions on gravity surveys in Wilderness.

Dave Cline, Regional Vice President of National Audubon Society visited the refuge in April and informed us we were being adopted.

On August 18, RD Gilmore and DRD Olsen accompanied Director Dunkle on a tour of the refuge. On August 20, DRD Olsen was back with Jeff Powers, from Congressman Young's staff, for the grand tour.

On August 22, Assistant Secretary of Interior for Policy, Budget, and Administration, Jerry Rizzo, and his aide, Marty Smith, visited the refuge and discussed budget and operations.

National Audubon Society President Peter Berle and family visited the refuge on August 26, and met with the staff.

Assistant Secretary of Interior, Bill Horn, toured the refuge on September 7, and discussed access regulations. He was followed on September 22, by Deputy Assistant Secretary Susan Reese, expressing similar interests.

DRD Olsen and Bill Palmisano from the R.O., and Hal O'Connor from the W.O. visited on December 5, to discuss refuge research.

4. Credits

All refuge staff participated in the writing and photography of the narrative. It was edited by Mike Boylan, coordinated by Mike Hedrick, and typed in its entirety by Pat Fencel and Deanne Nelson.

K. FEEDBACK

Wilderness - This means different things to different people. I know because I've heard almost diametrically opposed viewpoints from various individuals concerning issues involving Congressionally designated wilderness areas. This may not sound strange, but all the individuals that I'm referring to work for the FWS!. I heard the statement while I was stationed in D.C. that, "the refuge folks (RO included) in Alaska hide behind wilderness to justify their position." At the field level, I'm told that the RO takes a very liberal interpretation of the Wilderness Act that allows activities (e.g., economic and inholding access) that were forbidden by Congress. I've also observed almost universal conservative views among refuge field employees. What I'm saying is that there is confusion and disagreement at nearly every level of the Service and that this issue should be discussed openly and hopefully resolved. Perhaps this would be a good topic for discussion at the annual Project Leader's meeting. If there is an expert in the FWS on the history of the Wilderness Act, maybe it would be money well spent to have them attend a Project Leader's Meeting to address this issue. As a minimum, employees, at all levels that deal with wilderness issues, should re-read the Wilderness Act annually. However, I suspect if that is done only the letter of the law will be read and understood and not the intent.

L. APPENDIX



U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
KENAI NATIONAL WILDLIFE REFUGE
P.O. Box 2139, Soldotna, AK 99669
TRAPPING PERMIT

Permittee Name _____ AK Trapping License No. _____

Mailing Address _____

Residence _____

Phone No. _____

Permit Number _____

Date Issued _____

Period of use

From _____ 19 _____

Through _____ 19 _____

Trap and snare tag or mark _____

TRANSPORTATION MEANS	YEAR	MODEL	COLOR	LICENSE/REG. NO.
Aircraft	_____	_____	_____	_____
Vehicle	_____	_____	_____	_____
Snowmobile	_____	_____	_____	_____
Other	_____	_____	_____	_____

NOTE: THE TRAPPING CONDITIONS SUPPLIED HERewith ARE PART OF THIS PERMIT.

This permit is issued by the U.S. Fish and Wildlife Service and accepted by the undersigned Subject to the terms, obligations, and provisions expressed or implied herein and to the general and special trapping conditions supplied herewith.

Permittee's Signature _____

Date _____

Issuing Officer's Signature _____

Title _____

Date _____

GENERAL CONDITIONS

Pursuant to the Code of Federal Regulations (CFR), Title 50, Section 31.16, the following conditions apply to the trapping of furbearing animals on National Wildlife Refuges.

1. State and Federal requirements - Trapping will be done in compliance with State game laws and regulations, and may be further restricted by general and special conditions of the Refuge Trapping Permit. Permittees will also comply with all other regulations and conditions affecting access to and use of the National Wildlife Refuges.

2. Trapping permits - Any person exercising the privilege of trapping furbearing animals within National Wildlife Refuge boundaries must possess a valid State trapping license and a Refuge Trapping Permit issued by the refuge manager. Trappers will carry such State trapping license and Refuge Trapping Permit while trapping, and when requested to do so, will exhibit them to any Federal or State agent authorized to enforce the game and fish laws of the State or of the United States. Permits are not transferable.

The refuge manager may at any time, before or during the trapping season, halt or limit trapping on the refuge or any portion thereof. Conditions of the permit may be modified as needed. Any changes will be made by an addendum (signed by both the issuing officer and the permittee) which should be attached to, and becomes a part of, the permit.

3. Approved traps, trap inspection, and removal - Furbearing animals authorized to be taken on the refuge may be taken only by methods approved by both the State and the refuge manager.

Trap types, sizes, sets, baits, scents, and locations will be selected to minimize the taking of non-target species.

The possession or use within the boundaries of the refuge of any trap or captive device that does not comply with State and refuge requirements is prohibited. Any such illegal traps or devices found on the refuge may be seized and retained by the refuge manager.

SEE REVERSE SIDE

GENERAL CONDITIONS (Continued)

4. Tending another person's traps - No person may attend another person's traps or trap line unless specifically authorized by the refuge manager.

5. Non-target species - Every effort will be made to prevent the capture of non-target species. However, if an unauthorized animal is found alive and in satisfactory condition in a trap, it shall be immediately released. Animals found dead or seriously injured in the traps shall be disposed of as designated by the refuge manager.

6. Reports - Permittees shall submit a report (or reports) of traptake, of both target and non-target species, as required by refuge special conditions. The capture of all non-target species, regardless of condition, will be reported. Trappers should also promptly report the presence of diseased animals to the refuge manager.

7. Penalties - Failure of a permittee to comply with any of the trapping provisions or with any applicable Federal or State law or regulation may be sufficient cause for refusal of any other use or privilege on the refuge for which a permit may be required.

The permit may be revoked or suspended by the issuing officer for just cause, such as violation, non-compliance with permit conditions, or non-use (50 CFR 25.43).

Permittees who wish to appeal adverse decisions should follow the appeals procedures designated in 50 CFR 25.44.

8. Damages - The United States shall not be responsible for any loss or damage to property, including but not limited to, animals and equipment; for injury to the permittee, partner(s), or assistant(s); or for damages or interference caused by wildlife or employees or representatives of the Government carrying out their official responsibilities.

SPECIAL KENAI NATIONAL WILDLIFE REFUGE CONDITIONS

1. All traps and snares will be identified by their owner by a refuge-approved mark or tag.

2. All traps and snares will be checked at least once every seven days.

3. Traps and snares are prohibited within 30 feet of sight-exposed baits. Sight-exposed bait means any visible part or facsimile thereof, (excluding dry skeletal items from which the skin, hair, feathers, and flesh have been removed) used to visually attract an animal to a trap or traps.

4. Report all tags and radiocollars taken from furbearers within 3 days and return within 5 days to the refuge or the Alaska Dept of Fish & Game.

5. Trapping is prohibited within one mile of public roads, 2 miles of campgrounds and trailheads, and within the Skilak Loop Special Management Area (SLSMA) (including the Kenai River within this area) as depicted on map available at refuge headquarters, provided, however, that trapping for mink and muskrat using leghold traps 1-1/2 or smaller and 110 or 120 conibears will be allowed in these areas outside of the SLSMA.

6. An accurately completed furbearer harvest report must be submitted to the refuge manager by June 15, 1987.

NOTE: Steel leghold traps having teeth, spiked, or serrated jaws (either attached or as part of the trap) will be prohibited beginning with the 1987-88 season.

SPECIAL CONDITIONS FOR LYNX TRAPPING ON THE KENAI NATIONAL WILDLIFE REFUGE

1. Lynx trapping is prohibited in GMU 15A. Trapping or attempting to trap lynx on the refuge north of the Kenai River including GMU 15A and that portion of GMU 7 within the refuge is prohibited.

2. Lynx may be trapped on the remainder of the refuge only during the December 15-January 31 season.

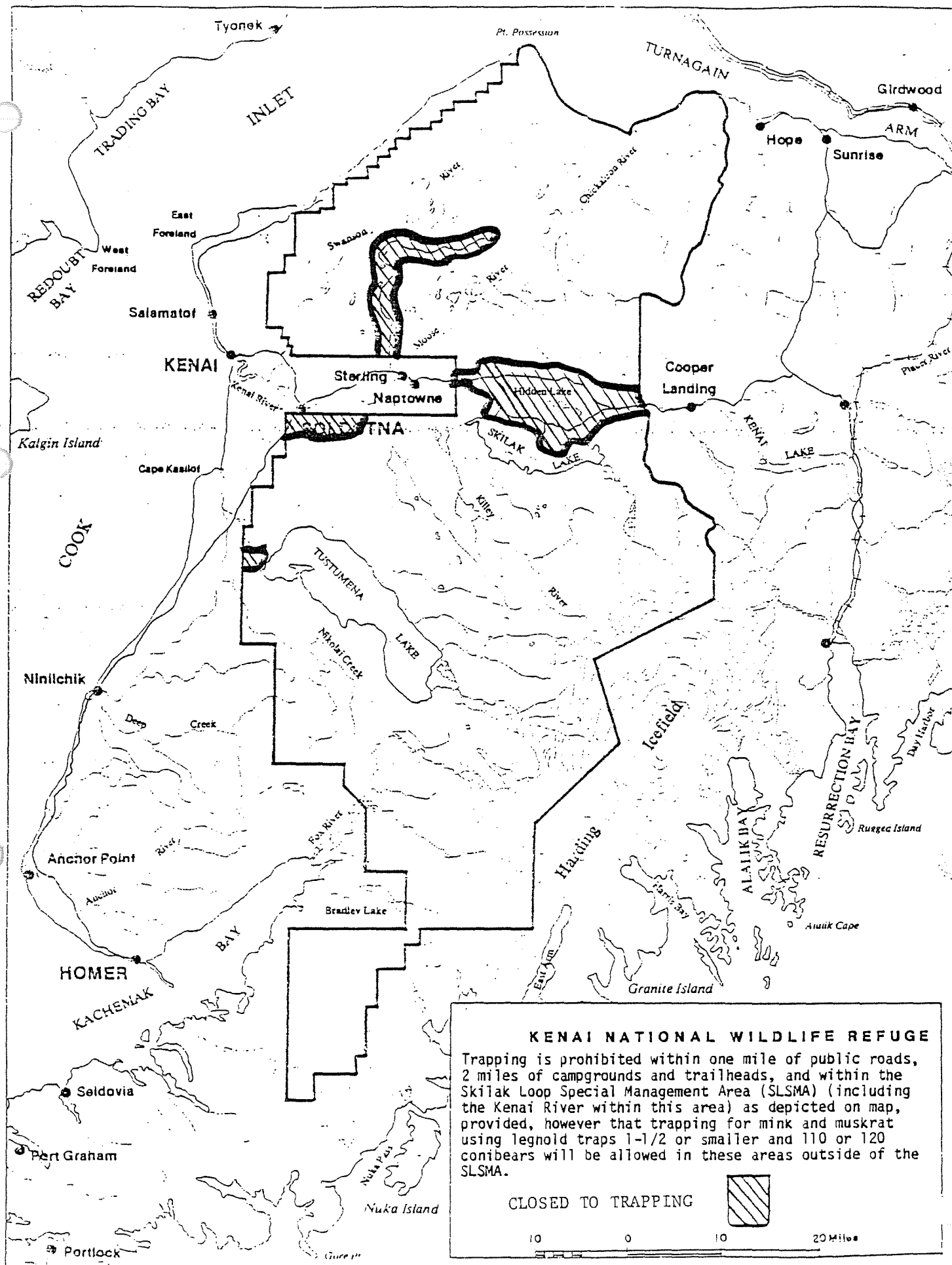
3. Cubby and flag sets are prohibited in those portions of the refuge closed to lynx trapping and may be used in other areas on the refuge only during the December 15-January 31, lynx season.

4. Outside of legal seasons and areas, the whole unskinned carcass of lynx accidentally killed in sets (snares) for other species must be turned into the refuge within 72 hours of discovery. The pelts will become the property of the State of Alaska.

5. The carcasses from all lynx legally taken on the Kenai NWR should be turned into the refuge as soon as practical. Trappers will receive a compensation of \$10.00 for the whole skinned carcasses.

NOTE: Please do everything you can to reduce the incidental capture of lynx such as setting coyote snares at least 16" off the ground, and avoiding all cat lures or lures with a strong castor base.

6. Any lynx, regardless of condition, captured incidentally to trapping for other species, in closed areas or during closed seasons, must be reported for release to Kenai NWR or ADF&G. Refuge and ADF&G biologists will be available to examine all accidentally captured lynx and assist trappers in safely releasing lynx. Contact the refuge (262-7021), Ted Bailey (262-5129), or Ed Bangs (262-5517) day or night.



Permit No. _____

FURBEARER HARVEST REPORT 1986

Trapper's Name _____

Permit No. _____

Please check and answer the appropriate statement:

 I did not trap on the refuge.

_____ I trapped on the refuge about _____ days, had approximately _____ sets out, and caught the following furbearers:

[illegible]

REPORTS DUE: June 15, 1987

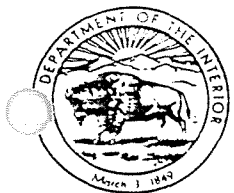
Kenai National Wildlife Refuge, P. O. Box 2139, Soldotna, AK 99669-2139

FURBEARER HARVEST REPORT 1986 (Continued)

[illegible]

INCIDENTAL CAPTURES

[illegible]



IN REPLY REFER TO:

United States Department of the Interior

KENAI NATIONAL WILDLIFE REFUGE
P.O. BOX 2139
SOLDOTNA, ALASKA 99669-2139
(907) 262-7021

TO: Refuge Trappers on the Kenai National Wildlife Refuge

A significant decline in lynx harvest despite an abundance of snowshoe hares and increased trapping effort on the Kenai National Wildlife Refuge over the past five years has prompted the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service to temporarily close the lynx season on the refuge north on the Kenai River and to shorten the season from 4 months to 45 days (December 15-January 31) over the remainder of the Kenai Peninsula, GMU 15B, 15C, and 7, and refuge south of the Kenai River. This is being done now to reduce mortality on lynx presently in the population and to allow for increased recruitment and survival and hence growth into the refuge lynx population before the snowshoe hare population "crashes". Once the hare population crashes, studies have indicated lynx productivity drops dramatically and few kittens survive for periods ranging from 3-5 years. To insure that a healthy population of adult lynx is present when snowshoe hares again start to increase, trapping of lynx will probably be curtailed in the northern refuge for at least 3-5 years, since the present high snowshoe hare populations "crashed" during the 1985-86 winter. It will also be closed in the remainder of the refuge once the snowshoe hare population crashes. Refuge and Alaska Department of Fish & Game biologists will test and develop techniques to determine when the lynx season will again be opened.

Once the number of snowshoe hare and lynx are increasing and the number of lynx on the refuge is deemed capable of supporting a sustained harvest, a limited season and/or quotas will be again allowed. If snowshoe hares and lynx follow the classical, average 10-year cycle, lynx trapping will probably be closed at least 3-5 years on the refuge. Since lynx populations are so low, please do everything you can to prevent accidentally catching lynx in sets made for other species. Refuge biologists will be available to safely release any lynx you may incidentally catch.



IN REPLY REFER TO:

United States Department of the Interior

KENAI NATIONAL WILDLIFE REFUGE

P.O. BOX 2139

SOLDOTNA, ALASKA 99669-2139

(907) 262-7021

TO: 1986-87 Kenai National Wildlife Refuge Trappers

We will purchase the following skulls, not to be returned, and carcasses of furbearers taken on the refuge during the 1985-86 trapping season to obtain biological information. Please record or remember date of capture and sex of furbearer when turning in skulls or carcasses.

<u>FURBEARER</u>	<u>PRICE</u>	
	<u>SKULL ONLY</u>	<u>CARCASS WITH SKULL</u>
Lynx	---	\$10.00
Wolverine	---	\$10.00
Wolf	\$10.00	(wolf carcasses will not be purchases)

Office Hours: 8:00 AM - 4:30 PM (Monday-Friday)

Telephone: 262-7021

TRAPPING TIPS

TO: 1986-87 Kenai National Wildlife Refuge Trappers

Each year the number of trappers using the refuge increases. Many of these trappers have had limited experience trapping in Alaska. To insure the wisest possible use of the furbearer resource, and to provide for an enjoyable trapping experience, we have listed a few trapping tips that we hope will be useful. Remember, good trapping ethics are a result of common sense, courtesy, and experience.

1. TAKE FIELD NOTES

A good way to learn what is the most effective set or scent is to keep a written record of your sets. Besides making you a better trapper, notes prevent you from forgetting about a set. An unforgettable location with 2 inches of snow looks different after 2 feet of fresh powder. A trap left in the woods costs you money and sometimes results in wasted fur. Your field notes are also valuable when sealing fur to help remember the dates and locations of catches.

2. SECURING TRAPS

Traps must be fastened securely to hold the largest furbearer that may enter the set. Traps anchored solidly should be on as short a chain as possible to minimize the distance an animal can lunge against the chain. When a drag log or metal 2 or 3 prong grapple hook is used, the chain should be five to seven feet long to allow for entanglement in brush (avoid using drag logs or grapple hooks along rivers). When fastening the trap to a drag log (dried spruce 5 feet long by 5 inches in diameter), secure the chain ring with a fence staple, then 6 to 8 tight wraps of 14 gauge wire. The chain should be attached to the drag log approximately 1/3 the distance from the larger end. Two swivels should be used with short chains and three with longer chains to prevent twisting, and never use only staples to fasten traps set for larger furbearers. A partially rotten log, used as a drag, or a few twists of wire will not hold a wolf or coyote and will probably result in a lost trap and wasted animal.

3. HOW TO REDUCE INCIDENTAL CATCHES

Although exposed baits and carcasses may attract furbearers, they also attract many scavenging birds. If you decide not to use a cubby set, make your sets some distance (30 feet or more) from the exposed bait or on trails to the carcass. This way you won't catch birds, and any animal you do catch won't be so near the bait that it frightens off other furbearers. If you do accidentally catch a bird, try to release it unharmed. If an eagle gets in a set and you can't release it, or if it is injured, please notify us and we will assist you. Please be aware that under the Bald Eagle Protection Act and Migratory Bird Treaty Act, if you attract an eagle or migratory bird (owls, hawks, etc.) into your trap using sight or exposed baits and it dies, you are liable for Federal Prosecution. You are responsible for your traps. To avoid catching beaver in otter or mink sets prior to beaver season, we recommend you do not make sets in beaver dams prior to February 1.

3. (Continued) To avoid catching lynx in wolf and coyote sets -- set snares at least 16" above the trail and the loop at least 14" in diameter. Also avoid using lures with a strong castor base.

4. MANAGING BEAVER ON YOUR LINE

Beaver trappers should attempt to limit their catch to no more than 2 beaver per lodge. If you make a set between the lodge and cache, you will probably get the kits. The farther from the lodge your set, the more likely you will catch large, more valuable, beaver. Taking more than 2 beaver out of a lodge can eliminate next year's trapping spot. To prevent overharvest, do not trap at a lodge where someone else has already trapped. Leave some for next year.

5. HELPING MANAGE THE RESOURCE

Trappers are among the most conscientious and concerned people that a wildlife manager deals with. Please try to insure that your actions reflect that strong conservation ethic. Make good sets, check them regularly, be considerate of other trappers, and keep informed of State and Federal regulations. The future of trapping depends upon good trapper ethics.

6. KEEP MOOSE OUT OF SNARES

When setting snares in well used game trails, keep in mind that moose extensively use these trails and can be accidentally caught. One method to reduce the risk of snaring a moose is to wire (securely) a heavy log (2-4 inches diameter) across the game trail above your snare. Moose will generally go around such an obstruction. A snare that has been knocked down by a moose doesn't catch much fur. In making your sets, do not block off or make sets on major refuge trails that snowmobilers, skiers, and dog sledders will be using.

If you accidentally snare a moose, do not attempt to release it by yourself. Call either the Department of Fish & Game (262-9368) or Kenai National Wildlife Refuge (262-7021) and we will assist in releasing the animal.

7. Please inform Department of Fish & Game or Kenai NWR biologists as quickly as possible if you catch wolves or coyotes with noticeable pelt damage. This may be an indication of an exotic louse parasite that has infected wolves and coyotes on the Kenai Peninsula and that biologists are trying to correct.

Thank you for your cooperation and please notify us if you feel we can do more to enhance furbearer populations or your trapping experience on the Kenai National Wildlife Refuge.

Good luck.



IN REPLY REFER TO:

United States Department of the Interior

KENAI NATIONAL WILDLIFE REFUGE
P.O. BOX 2139
SOLDOTNA, ALASKA 99669-2139
(907) 262-7021

TO: All Trapping Permit Holders on the Kenai National Wildlife Refuge

We want to obtain more information on furbearers and trapping pressure on the Kenai National Wildlife Refuge. We need your help to obtain this information and request that you accurately record the following information on the attached sheets throughout the coming trapping season and return it no later than June 15, 1987. Failure to return a harvest report will make you ineligible for a trapping permit in 1987.

1. Whether you trapped or not, and if you did trap, the numbers of days you trapped on the refuge and the average number of sets you had out (to determine the catch per effort).
2. Furbearer species (to identify number taken and year to year trend in numbers).
3. Month of capture (to determine when certain species are most vulnerable to capture, etc.).
4. Sex (male, female, unknown) (to determine when one sex is more vulnerable to capture at certain times of the year than others).
5. Any tags or collars (to determine the fate of study animals).
6. Location of capture (we are not asking you to divulge the locations of your sets, but merely the general area of capture. For example: mink-Skilak Lake; coyote-Mosquito Lake area; otter-Hidden Creek; beaver-Swan Lake, etc.). This information is needed to:
 - a. Determine distribution of furbearers on refuge and identify areas important to furbearers; and
 - b. Determine areas of intense and light trapping pressure.

Thank you.

Table 1. Total reported land furbearer harvest and average per permit holder on the Kenai National Wildlife Refuge (Moose Range), 1960-1986.

Land furbearer reported harvest											
Season	Total permits	Lynx		Coyote		Wolverine		Weasel		Wolf	
		Total	Mean per permit holder	Total	Mean per permit holder	Total	Mean per permit holder	Total	Mean per permit holder	Total	Mean per permit holder
1960-61	16	13	0.6	15	0.9	1	0.1	1	0.1	--	---
1961-62	24	23	1.6	30	1.2	4	0.2	13	0.5	--	---
1962-63	28	28	1.0	27	1.0	2	0.1	0	0	--	---
1963-64	33	28	0.8	39	1.2	1	< 0.1	6	0.2	--	---
1964-65	17	24	1.4	11	0.6	6	0.3	10	0.6	--	---
1965-66	16	17	1.1	16	1.0	4	0.2	2	0.1	--	---
1966-67	25	7	0.3	5	0.2	4	0.2	35	1.4	--	---
1967-68	---	---	---	---	---	---	---	---	---	--	---
1968-69	22	18	0.8	44	2.0	1	< 0.1	81	3.7	--	---
1969-70	53	62	1.2	23	0.4	3	0.1	35	0.7	--	---
1970-71	59	67	1.1	30	0.5	10	0.2	79	1.3	--	---
1971-72	61	181	3.0	13	0.2	14	0.2	35	0.6	--	---
1972-73	65	146	2.2	51	0.8	8	0.1	4	0.1	1	< 0.1
1973-74	81	245	3.0	58	0.7	7	0.1	149	1.8	0	0
1974-75	52	162	3.1	24	0.5	10	0.2	68	1.3	0	0
1975-76	70	113	1.6	32	0.5	6	0.1	16	0.2	1	< 0.1
1976-77	86	53	0.6	25	0.3	6	0.1	10	0.1	2	< 0.1
1977-78	86	43	0.5	34	0.4	4	< 0.1	14	0.2	8	0.1
1978-79	96	36	0.4	44	0.5	3	< 0.1	7	0.1	32	0.3
1979-80	104	12	0.1	64	0.6	3	< 0.1	58	0.6	19	0.2
1980-81	102	2	< 0.1	38	0.4	0	0	14	0.14	16	0.16
1981-82	104	17	0.2	66	0.6	4	0.1	70	0.7	44	0.4
1982-83	122	* 47	0.4	80	0.6	2	< 0.1	43	0.3	39	0.3
1983-84	114	** 38	0.3	87	0.8	2	< 0.1	29	0.2	30	0.3
1984-85	107	*** 31	0.3	107	1.0	2	< 0.1	17	0.2	38	0.3
1985-86	113	**** 23	0.2	110	1.0	3	< 0.1	3	< 0.1	32	0.3

*Includes 9 lynx, radiocollared and released for study.

***Includes 7 lynx, radiocollared and released.

**Includes 1 lynx, radiocollared and released for study.

****Includes 2 lynx, radiocollared and released.

Table 2. Total reported aquatic furbearer harvest and average per permit holder on the Kenai National Wildlife Refuge (Moose Range), 1960-86.

Aquatic furbearer reported harvest									
Season	Total permits	Beaver		Otter		Muskrat		Mink	
		Total	Mean per permit holder	Total	Mean per permit holder	Total	Mean per permit holder	Total	Mean per permit holder
1960-61	16	145	9.1	16	1.0	2	0.1	42	2.6
1961-62	24	79	3.3	19	0.8	0	0	69	2.9
1962-63	28	109	3.9	19	0.7	2	0.1	66	2.4
1963-64	33	150	4.5	26	0.8	0	0	83	2.5
1964-65	17	6	0.3	3	0.2	0	0	15	0.9
1965-66	16	17	1.1	4	0.2	0	0	13	0.8
1966-67	25	22	0.9	9	0.4	0	0	45	1.8
1967-68	---	---	---	---	---	---	---	---	---
1968-69	22	14	0.6	10	0.4	207	9.4	64	2.9
1969-70	53	33	0.6	32	0.6	75	1.4	82	1.5
1970-71	59	25	0.4	9	0.1	29	0.5	60	1.0
1971-72	61	23	0.4	8	0.1	18	0.3	9	0.1
1972-73	65	76	1.2	24	0.4	111	1.7	48	0.7
1973-74	81	40	0.5	26	0.3	334	4.1	160	2.0
1974-75	52	6	0.1	8	0.1	21	0.4	33	0.6
1975-76	70	34	0.5	13	0.2	82	1.2	25	0.4
1976-77	86	24	0.3	7	0.1	8	0.1	39	0.4
1977-78	86	19	0.2	9	0.1	140	1.6	33	0.4
1978-79	96	22	0.2	6	0.1	73	0.8	25	0.3
1979-80	104	83	0.8	17	0.1	127	1.1	57	0.5
1980-81	102	82	0.8	30	0.3	191	1.9	111	1.1
1981-82	104	61	0.6	26	0.2	183	1.8	119	1.1
1982-83	122	93	0.8	18	0.1	227	1.8	202	1.6
1983-84	114	43	0.4	18	0.2	39	0.4	268	2.3
1984-85	107	103	1.0	20	0.2	121	1.1	392	3.7
1985-86	113	86	0.8	21	0.2	209	1.8	317	2.7

November 25, 1986

Refuge Manager
Post Office Box 2139
Soldotna, Alaska 99669

Dear Refuge Manager:

Our family looked forward to visiting your highly touted Kenai National Wildlife Refuge in September with much anticipation. After hiking extensively in various parts inside its boundaries, I can honestly say we did not see one living thing--not even a bird! It was incredible after spending so much money to realize that we can see more wildlife in our own backyard in Edmonds, Washington, which is a suburb of Seattle.

What we did not understand is why you call it a wildlife refuge when you allow hunting and trapping inside the area. I believe the term Wildlife Refuge is misleading, inappropriate and downright dishonest if the wildlife in its boundaries is not protected 365 days a year.

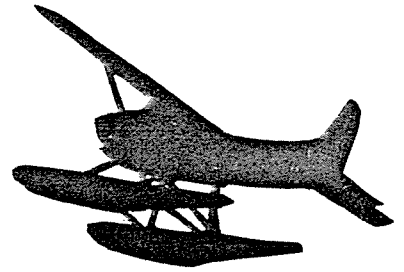
What further puzzled our family was your pamphlet (1986-693-828) that we received at your main headquarters in Soldotna which stated, "A place where the needs of wildlife come first". I think it would have been more honest to state, "A place where the needs of humans come first". At least one could then understand why you allow the killing of wildlife through hunting and trapping and further allow berry picking, snowmobiling and cabin construction, hay removal and grazing with a Special Use Permit.

I urge you, as an agent of the Department of the Interior, to change the name of this area and also your marketing literature so that other citizens are not duped into believing that this really is some kind of a wildlife refuge.

Sincerely,

Kenai National Wildlife Refuge

Aircraft Regulations



Kenai National Wildlife Refuge Aircraft Regulations 50 CFR 36.39(1)

1. The operation of aircraft on the Kenai NWR, except in an emergency, is permitted only as authorized in designated areas as described below. These areas are also depicted on a map available from the refuge manager.
2. Within the Canoe Lakes, Andy Simons, and Mystery Creek Units of the Kenai Wilderness, only the following lakes are designated for airplane operations:

Canoe Lakes Unit

Scenic Lake	Grouse Lake	Snowshoe Lake	Bird Lake
Nekutak Lake	King Lake	Wilderness Lake	Cook Lake
Shoepac Lake	Bedlam Lake	Mull Lake	Sandpiper Lake
Norak Lake	Taiga Lake	Tangerra Lake	Vogel Lake

Pepper, Gene, and Swanson Lakes are only open for sport ice fishing.

Andy Simons Unit

Upper Russian Lake	Lower Russian Lake	Pothole Lake
Twin Lakes	Iceberg Lake	Harvey Lake
Emerald Lake	Green Lake	Martin Lake
High Lake	Kolomin Lakes	Windy Lake
Dingelstadt Glacier terminus lake	Wosnesenski Glacier terminus lake	

Tustumena Lake and all wilderness lakes within one mile of the shoreline of Tustumena Lake.
All unnamed lakes in sections 1 & 2, T. 1 S., R. 10 W., and sections 4, 5, 8, & 9, T. 1 S., R. 9 W., S.M., AK.

Mystery Creek Unit

An unnamed lake in section 11, T. 6 N., R. 5 W., S.M., AK.

3. Airplanes may operate on all lakes outside the Kenai Wilderness except those lakes with recreational developments, including, but not limited to, campgrounds, campsites, and public hiking trails connected to road waysides. The non-wilderness lakes closed to aircraft operations are as follows:

North of Sterling Highway

Cashka Lake	Rainbow Lake	Ametz Lake	Afonasi Lake
Dolly Varden Lake	Dabbler Lake	Weed Lake	Imeri Lake
Nest Lakes	Lili Lake	Silver Lake	Upper Jean Lake
Mosquito Lake	Forest Lake	Breeze Lake	Watson Lake

South of Sterling Highway

All lakes in the Skilak Loop Area (South of Sterling Highway and North of Skilak Lake) are closed to aircraft except that airplanes may land on Bottenintnin Lake, which is open year-around and Hidden Lake, which is only open for sport ice fishing.

Headquarters Lake is restricted to administrative use only.

4. Notwithstanding any other provision of these regulations, the operation of aircraft is prohibited between May 1 and September 30, inclusive, on any lake where nesting trumpeter swans and/or their broods are present, except Windy, Scenic, and Lonesome Lakes where the closure is between May 1 and September 10, inclusive.

5. The operation of wheeled airplanes, at the pilot's own risk, is authorized on the unmaintained Big Indian Creek Airstrip, on gravel areas within 1/2 mile of Wosnesenski Glacier terminus lake, and within the SE 1/4, section 16 and SW 1/4, section 15, T. 4 S., R. 8 W., Seward Meridian.

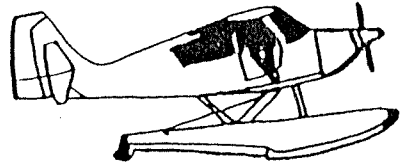
6. Unlicensed aircraft are permitted to operate on the refuge only as authorized by a special use permit from the refuge manager.

7. Airplanes may operate only within designated areas on the Chickaloon Flats, as depicted on a map available from the refuge manager.

8. Airplane operation is permitted on the Kaslof River, the Chickaloon River outlet, and the Kenai River below Skilak Lake from June 15 through March 14. All other rivers on the refuge are closed to aircraft.

For More Information, contact Kenai National Wildlife Refuge, P. O. Box 2139, Soldotna, AK, 262-7021.

KENAI National Wildlife Refuge



TURNAGAIN ARM

CHICKALOON BAY

Hope

COOK INLET

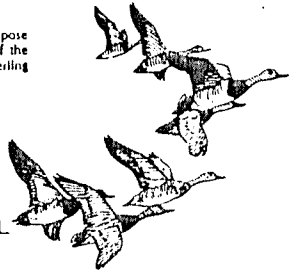
LEGEND

- Refuge boundary
- Wilderness area
- (closed to aircraft except designated lakes)
- Designated landing lake
- Seasonal (see regulations)
- Nonlake landing area
- Recreation area (closed to aircraft)
- Private land
- Primary road
- Secondary road
- Airstrip

Note: nonshaded areas open to lake landings

During the spring and fall, waterfowl concentrations can pose serious bird/aircraft hazards, especially in the vicinity of the Chickaloon Flats, Kenai River Flats, Moose River (near the Sterling Highway Bridge) and at the outlet of Skilak Lake.

CHUGACH NATIONAL FOREST



Kenai

Refuge Visitor Center Headquarters

Soldotna

Sterling

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

Kenai River

To Anchorage

SKILAK LAKE

Harvey

BEAR

ATN

Lower Russian L.

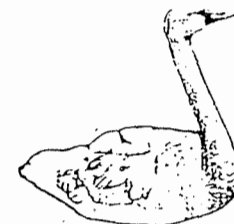
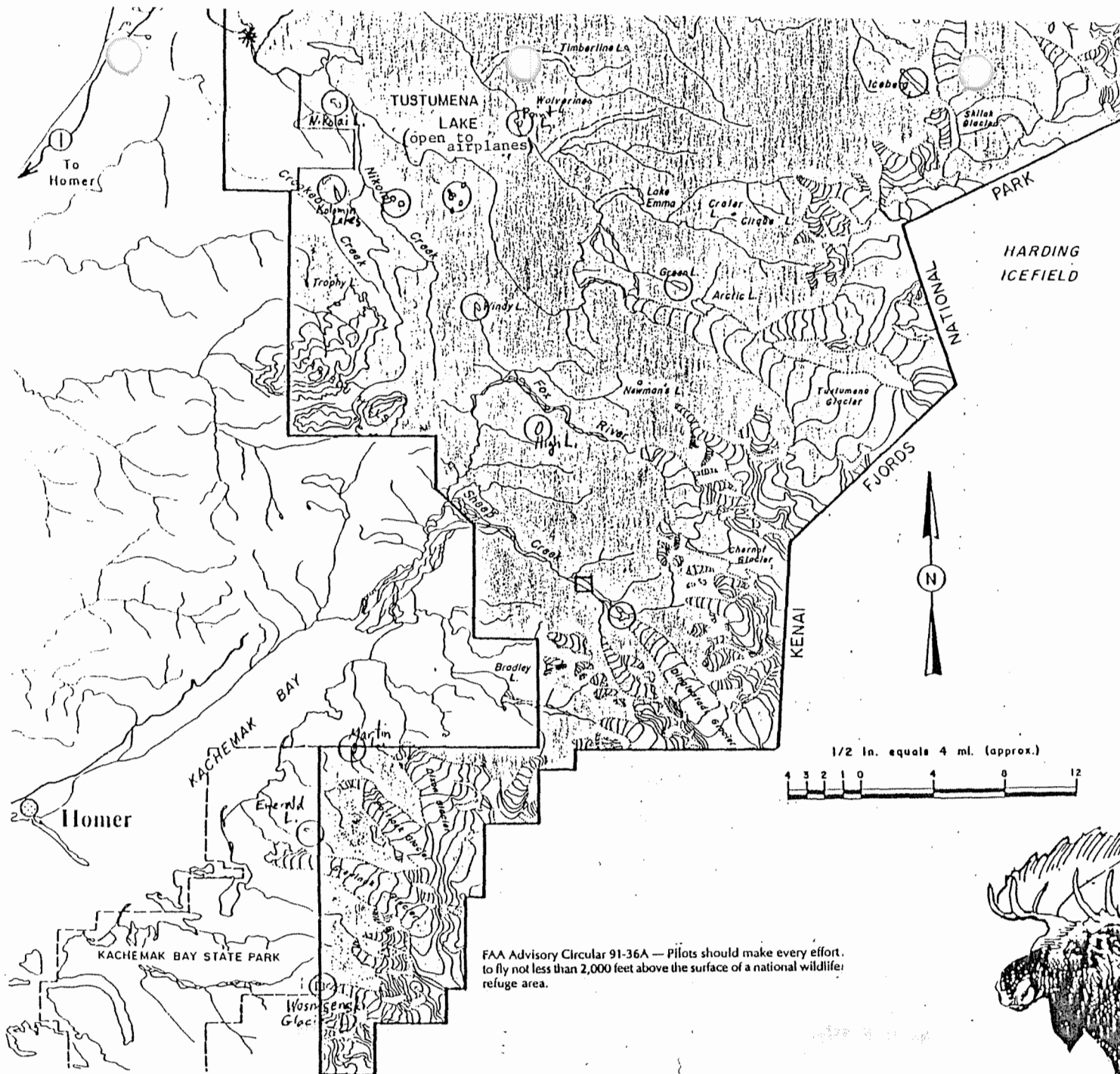
Cooper L.

Upper Russian L.

Kenai L.

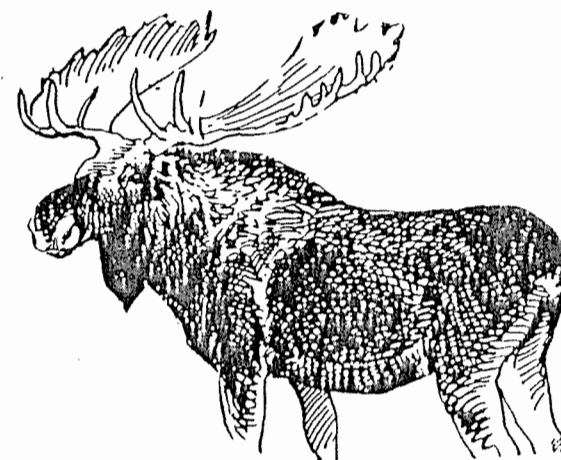
Kenai L.

Kenai L.



Lakes with nesting Trumpeter Swans or their broods closed 5/1-9/30. Consult refuge manager for lakes.

FAA Advisory Circular 91-36A — Pilots should make every effort to fly not less than 2,000 feet above the surface of a national wildlife refuge area.





OTHER FEDERAL AND STATE REGULATIONS

Code of Federal Regulations

50 CFR 36.12(c)

The use of helicopters in Alaska National Wildlife Refuges, other than at landing areas designated in special regulations or pursuant to the terms and conditions of a permit issued by the Refuge Manager, is prohibited.

50 CFR 36.12(e)

The operation of aircraft, at altitudes and in flight paths resulting in the herding, harassment, hazing, or driving of wildlife is prohibited.

50 CFR 36.12(f)

The owner(s) of downed aircraft must contact the Refuge Manager and comply with Refuge removal procedures.

50 CFR 36.12(h)

Salvaging, removing, possessing, or attempting to salvage, remove, or possess any downed aircraft or component parts thereof is prohibited, except in accordance with a removal procedures established by the Refuge Manager.

AIRBORNE HUNTING ACT

Airborne hunting-Prohibition; penalty

Any person who--

- (1) while airborne in an aircraft shoots or attempts to shoot for the purpose of capturing or killing any bird, fish, or other animal; or
- (2) uses an aircraft to harass any bird, fish, or other animal; or
- (3) knowingly participates in using an aircraft for any purpose referred to in paragraph (1) or (2);

shall be fined not more than \$5,000 or imprisoned not more than one year, or both.

Alaska Department of Fish and Game -- All Alaska Department of Fish and Game regulations governing the use of aircraft applicable to this area shall be considered part of refuge regulations and shall be enforced.

-- The Kenai Controlled Use Area, which consists of QMU 15(A), is closed during QMU 15(A) moose-hunting seasons to the use of aircraft in any manner for hunting moose, including transportation of moose hunters and moose parts; however, this does not apply to the area north of the Sterling Highway after 12:01 A.M., September 11, and does not apply to transportation of moose hunters or moose parts by regularly scheduled flights to and between cities, towns, or villages that normally provide scheduled service to this area.

-- SAME DAY AIRBORNE HUNTING 5 AAC 92.085

A person who has been airborne may not take or assist in taking big game until after 3:00 A.M. following the day which the flying occurred; however, this does not apply to taking deer.

-- HELICOPTERS 5 AAC 92.080

Use of helicopters is prohibited in any manner, including transportation to or from the field of any unprocessed game or parts of game, hunters or hunting gear, or any equipment used in the pursuit or retrieval of game; this does not apply to transportation of hunters, hunting gear, or game during emergency rescue operations in a life-threatening situation.

PILOT REFERENCES

Sectional Aeronautical Charts: Anchorage, Seward, McGrath, Kodiak.
World Aeronautical Chart
Federal Aviation Administration
Airman's Information Manual
Alaska Supplement



KENAI NATIONAL WILDLIFE REFUGE

ORV/SNOWMOBILE REGULATIONS

The operation of off-road vehicles, commonly referred to as all-terrain vehicles (ATV's) (including 3-wheelers) is prohibited on the Kenai National Wildlife Refuge, with the exception of seasonal use by snowmobiles. Snowmobiles are authorized only on designated areas as delineated on the attached map and subject to the following:

1. A snowmobile is defined as a self-propelled vehicle intended for off-road travel on snow having a curb weight of not more than 1,000 pounds, driven by track or tracks in contact with the snow, and steered by ski or skis in contact with the snow.

2. Only snowmobiles with an overall width less than 46 inches and under 1000 pounds are permitted.

3. The use of snowmobiles may be authorized by the refuge manager between December 1 and April 30 only when snow depth is sufficient to protect the underlying vegetation and terrain along the route of travel and only after public notification.

4. Snowmobiles may not be used on maintained roads within the refuge. Snowmobiles may cross a maintained road after stopping and when traffic on the roadway allows safe snowmobile crossing.

5. Snowmobile use must be compatible with the purposes for which the refuge was established. Use of snowmobiles in support of wildlife-oriented recreational activities such as fishing or trapping is compatible. Activities such as racing, harassment of wildlife, or destruction of habitat are incompatible.

6. All areas above timberline, except Caribou Hills, are closed to snowmobile use. (See accompanying map.)

7. The area within sections 5, 6, 7, and 8, T.4N., R.10W., S.M., AK, east of the Sterling Highway right-of-way including refuge headquarters complex, the environmental education/cross-country ski trails, Headquarters and Nordic Lakes, and the area north of the east fork of Slikok Creek and northwest of a prominent seismic trail to Funny River Road, is closed to snowmobile use. (See accompanying map)

8. An area, including the Swanson River Canoe Route and portages, beginning at the Paddle Lake parking area, then west and north along the Canoe Lakes wilderness boundary to the Swanson River, continuing northeast along the river to Wild Lake Creek, then east to the west shore of Shoepac Lake, south to the east shore of Antler Lake, and west to the beginning point near Paddle Lake, is closed to snowmobile use. (See accompanying map)

9. An area, including the Swan Lake Canoe Route, and several road-connected public recreational lakes, bounded on the west by Swanson River Road, on the north by the Swan Lake Road, on the east from a point at the east end of Swan Lake Road south to the west bank of the Moose River, and on the south by the refuge boundary, is closed to snowmobile use. (See accompanying map)

10. Within the Skilak Loop Special Management Area, snowmobiles are prohibited except on Hidden, Kelly, Petersen, and Engineer Lakes for ice fishing access only. Upper and Lower Skilak Lake campground boat launches may be used as access points for snowmobile use on Skilak Lake. (See accompanying map)

11. Refuge lands, conveyed to native groups under the Alaska Native Claims Settlement Act or Alaska National Interest Lands Conservation Act, are private lands and snowmobiling privileges must be obtained from the appropriate native group. (See accompanying map)

FOR MORE INFORMATION, PLEASE CONTACT

KENAI NATIONAL WILDLIFE REFUGE
P. O. BOX 2139
SOLDOTNA, ALASKA 99669-2139

SKILAK LOOP RECREATION AREA

