KENAI NATIONAL WILDLIFE REFUGE

Soldotna, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1984

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

NATIONAL WILDLIFE REFUGE SYSTEM

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REVIEW AND APPROVALS

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Robert L. Delaney 3/25/85
Refuge Manager Date

Larry L. Calvert 4/9/85
Refuge Supervisor Review Date

Regional Office Approval 4/19/85
Date

R.O. copy Refuge plan

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Please replace in Kenai Narrative Report (previous located in Library)
Nov '81 check others as they return

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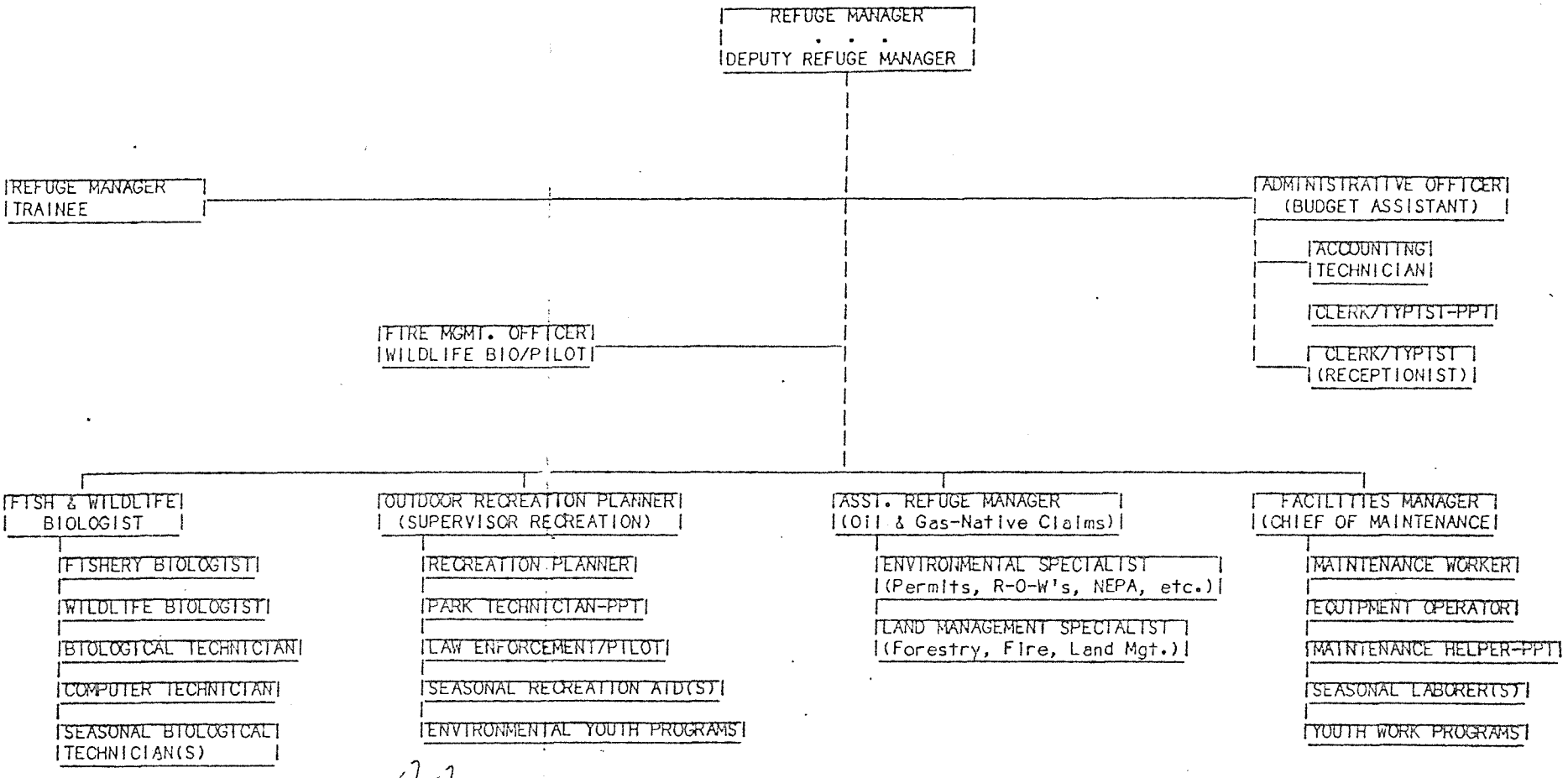
Nothing to report.

L. APPENDIX

Configuration of the Kenai NWR after ANILCA. Dotted portions indicate designated wilderness. (Staff Photo)

May 10, 1984

KENAI NATIONAL WILDLIFE REFUGE
ORGANIZATION CHART



APPROVED BY: Robert L Delaney 5/10/84
Refuge Manager Date

Asst. Regional Director (AWR) 1/8/85 Date

Larry L. Calvert 1/9/85
Refuge Supervisor South (RF) Date

Regional Director 1/9/85 Date

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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 km^2). 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.

A. HIGHLIGHTS

Years of surveys and data gathering finally paid off as Alaska Department of Fish and Game (ADF&G) agreed to an emergency closure for lynx trapping in the northern portion of the refuge with a much-reduced season for the rest of the Kenai Peninsula. (E. 5n)

An interagency brown bear team comprised of representatives from the Forest Service, ADF&G, and FWS began radiotracking and aerial surveys to determine density and distribution of brown bears on the refuge. (E. 51)

Some 330 acres of the refuge adjacent Soldotna Airport were granted to the City for airport expansion and road realignment in exchange for four acres of prime hangar and aircraft tie-down space at the growing airport. (C. 2b)

Kenai Peninsula Interagency Fire Management Plan was completed in May, 1984 and put into operation. (D. 2)

Draft proposal was prepared in 1984 to reintroduce 50 caribou onto the refuge with the cooperation of ADF&G in April, 1985. (G. 1)

Some 1200 acres were crushed and burned in 1984 as part one of the joint ADF&G/FWS Habitat Improvement Program in the Skilak Loop Special Management Area. In December, the final phase began as the crushers began rolling to crush a similar amount as in the previous season. (F. 9)

With public meetings concluded and the preferred alternative selected, the Kenai Comprehensive Conservation Plan went to the printer's as the year ended. (D. 1)

The first controlled burn in recent years went off without a hitch on June 11, in the Skilak Loop Special Management Area with Refuge, ADF&G, State Forestry, and U. S. Forest Service cooperating to burn 400 acres. (F. 9)

Kenai continued to attract notables as this year's visitors included Assistant Secretary G. Ray Arnett, BLM State Director Mike Penfold, BLM Director Robert Burford and his wife, ex-EPA head Ann Gorsuch Burford, a CBS film crew from Charles Kuralt's "Sunday Morning" show and FWS Deputy Director Gene Hester, among others. (J. 3)

An interpretation by the U. S. Attorney's office left Kenai without refuge special regulations for aircrafts, snowmobiles, and motorboats until new regulations are enacted. (H. 17)

A new Park Technician position was added to keep the visitor center running while needed maintenance and accounting positions were filled. But these gains were offset by two resignations as the year ended. (E. 1)

Two questionable native allotment claims went to an Administrative Law Judge where one was dropped by default and a decision on the other is expected by spring. (C. 3a.3)

A Federal judge's ruling, in November, that the proposed St. Matthews Island land exchange was illegal, 2,570 acres near Tustumena Lake and another 2,254 acres in five separate parcels were not returned to the refuge. (C. 1a.5)

In June, the Governor established the Kenai River Special Management Area, recognizing the unique values of this area and guaranteeing its protection. (C. 3b)

The refuge began talks with the City of Kenai to acquire 2,300 acres of prime waterfowl and caribou habitat on the Kenai River Flats, in exchange for the old "Moose Range" headquarters. (C. 1b)

B. CLIMATIC CONDITIONS

The year continued a five-year trend of below normal snowfall on the Kenai Lowlands and above normal winter temperature conditions. December was the second mildest on record with temperatures as high as 41° and the low a mild -10°. March weather was the third mildest on record with average temperatures of 24.7 and only .26" of precipitation. Total precipitation was again below normal (23%) with 15.23" recorded. Snowfall was 30% below the normal of 68.7" with only 48.3" recorded, (see Table 1).

Table 1. Monthly temperatures and precipitation data*.

Month	Temperature		Precipitation	
	High	Low	Total	Snow
January	39°	4°	1.56"	16.8"
February	37°	-22°	1.19"	14.2"
March	49°	10°	.26"	0.7"
April	48°	14°	.99"	3.4"
May	62°	24°	.10"	Trace
June	70°	33°	1.01"	0.0
July	67°	36°	1.37"	0.0
August	73°	24°	4.46"	0.0
September	64°	26°	1.49"	0.0
October	55°	9°	1.16"	2.0"
November	39°	- 6°	.93"	0.7"
December	41°	-10°	.73"	10.5"
38-Year Average Total			19.91"	68.7"
Total for 1984			15.25"	48.3"

*Reported by FAA at Kenai Airport

Snowfall was sufficiently low during the fall of 1983 and early winter of 1984 that the refuge snowmobile season did not open until January 6, at which time snow depths were adequate to protect the underlying vegetation and soils.

The large lowland Skilak and Tustumena lakes became ice covered on January 25 and 26, following two nights when temperatures plunged to -22° below zero. As last year, by mid-March, almost the entire lowlands were free of snow and open leads were developing in the ice on the lower Kenai River.

The Kenai River was ice free by March 27, as compared to March 23 in 1983, and April 19, in 1982. Ice left the Swanson River on April 12. Skilak Lake ice broke up on April 13, and on Tustumena Lake on April 20. All lowland lakes were ice free by May 8.

The first snow geese arrived on the Kenai River Flats on April 4, as compared to April 10 in 1983. Peak numbers were counted on April 20. Trumpeter swans were again recorded in late March on the Skilak Lake outlet.

Below average snowpack existed above valley floors to elevations of 2,500 feet. Higher elevations again received average to above average snowpack.

May and June were dry months with many sunny days but rain occurred in 16 days in July. The Kenai River remained below normal levels throughout the spring and summer period.

August was unseasonally cool and wet with 4.46 inches of rainfall occurring. Of this rainfall, 1.4" occurred over a two day period when a strong weather disturbance moved in over the Peninsula from the Gulf of Alaska. The first killing frost occurred on August 27.

September was warm with clear, windless days predominating. The first skiff of snow in the mountains occurred on September 19.

October was generally clear and cold. The first and only October snow on the lowlands (2") occurred on October 20, about 2 weeks later than average. Headquarters Lake first froze over on October 15, and most all lowland lakes, except the large Skilak and Tustumena Lakes, were frozen by month's end.

November was generally cloudy and overcast with only a few snow showers totalling less than an inch. Hidden Lake reopened on November 20, with winds reported at 50-60 mph.

December was the second mildest on record and had many days of freezing rain which reduced over 10 inches of snowfall to only partial ground cover by year's end.

C. LAND ACQUISITION

1. Fee Title

a. Alaska Native Claims Settlement Act (ANCSA)

1) Kenai Native Association, Inc. (KNA) - Under ANCSA, the Kenai Native Association was conveyed 18,083 acres of refuge lands under a BLM decision of February 5, 1980. These lands were conveyed with 22(g) stipulations of the Act, requiring such lands remain subject to the laws and regulations of the refuge. Use of these lands by the native group has mostly involved camping, fishing, and hunting activities with some access restrictions placed upon public use. The Association cannot develop a subdivision, airstrips, roads or conduct commercial ventures under 22(g) constraints outside those permitted on the refuge.

Although the KNA Board rejected a land trade agreement in 1982 which included clear title to 12,000 acres within the refuge, land exchange negotiations have continued. More recently, KNA submitted for FWS review a land exchange proposal which included Camden Bay lands and Arctic NWR subsurface estate. KNA Board of Directors withdrew their proposal in April 18, 1984 claiming, "the properties offered for trade by the Fish and Wildlife Service were not of sufficient value to the corporation to

warrant the trade." However, by year's end, KNA officials expressed a desire to again explore the possibility of a new land exchange agreement that may overcome what they see as restrictive 22(g) provisions.

During this period, KNA applied to the Corps of Engineers (COE) to place four floating docks in the Kenai River adjacent their conveyed land near the outlet of Skilak Lake. The proposed docks were within refuge waters and posed public concerns regarding their development and use along this natural shoreline as well as the possible impacts to resources and adjacent refuge lands. The lack of public support for the project compelled KNA to withdraw their proposal.

2) Salamatof Native Association, Inc. (SNA) - The Salamatof Native Association developed three boat ramps and three subdivisions within their conveyance adjacent the Kenai River. More than 200 lots were surveyed with those on the river selling briskly for $55,000, while lots upland and adjacent the Funny River Road were also moving well. "Moose Range Meadows" provides lots of one or two acres with no down payment under $20,000, 12% and 20 years to pay. Those from $20-35,000 require 10% down, 12% and 20 years.

During the development of subdivision roads, forest vegetation was cleared, topsoil and overburden placed aside and exposed gravel mined for the road bed. The surface was conveyed to the Natives with the subsurface remaining publicly owned. The Kenai River, its bed and islands were retained by the refuge. An agreement with SNA for a nondevelopment easement along both sides of the Kenai River in exchange for the sand and gravel used, was in draft form by the end of the year.

3) Tyonek Native Corporation - Since the conveyance of nearly 33,000 acres of refuge lands April 6, 1979, no use of those lands by the native group has been requested. The conveyance, also governed by 22(g) ANCSA provisions, may eventually provide land exchange possibilities for Tyonek.

4) Point Possession, Inc. (PPI) - The Bureau of Indian affairs, June 15, 1983, recognized Point Possession, Inc., as a native group for the selection of lands at Point Possession. This group has selected under Section 14(h) of ANCSA, 4,495.66 acres of designated wilderness in the Point Possession area. Secretarial Order 3038 waived a portion of 43 CFR 2653.6(7)(b)(1) thus authorizing the selection of refuge lands by native groups. Although PPI was to discuss land exchange options with the FWS, negotiations had not begun by year's end.

5) Cook Inlet Region, Inc. (CIRI) - Following a Federal Judge's ruling November 30, 1984 that the proposed "St. Matthew Island Land Exchange" was illegal, 2,570 acres of CIRI's selection of the surface estate near Tustumena Lake and another 2,254 acres of lands in five parcels selected under ANCSA section 14(h)(1), were not relinquished to the refuge. CIRI appealed the decision.

Under an agreement with the ARCO Exploration Company, CIRI conducted a 73 mile seismic exploratory program January through March. This program, some of which was outside the refuge, involved lands in the Sterling-Naptowne area of the refuge. Vibroseis equipment and helicopter portable methods, including surface and minihole explosives, were used. Approximately 689 miles of seismic data have been acquired under the ARCO/CIRI exploration agreement since 1979.

Under the same agreement, ARCO/CIRI drilled and abandoned the Funny River Well No. 1 at 18,009 feet, the deepest yet drilled on the Kenai Peninsula. Following the November reopening of the Wolf Lake No. 1 access road and the development of a new pad, ARCO/CIRI began drilling a new well, Wolf Lake No. 2, to a location north of a known fault zone.

Reclamation of the road access route to the ARCO/Funny River Well No. 1 following plugging and abandonment of the dry-hole well. (8/84, RAR)

Reclaimed access road to the ARCO/CIRI Funny River Wildcat Well No. 1 following abandonment of the dry hole well (8/84, RAR)

b. FWS initiated a land exchange with the City of Kenai that could bring up to 2,300 acres of prime wildlife habitat on the flats of the Kenai River into the refuge. In trade for the old 5-acre "Moose Range" administrative site within the business district, the refuge would acquire prime viewing for snow geese which stage there each spring on their way to the Wrangell Islands in Russia. The flats also provide the best opportunities to view caribou south of Denali Park.

2. Easements

a. Fritz Creek - Soldotna 115kV: Homer Electric Association (HEA) consultants from Gilbert/Commonwealth Associates, Inc., of Jackson, Michigan, conducted aerial surveys in August for a 60 mile 115kV transmission line from the Fritz Creek Substation near Homer, Alaska to the Ski Hill Substation adjacent the refuge boundary at Soldotna. This route will cross four miles of refuge lands west and north of the headquarters complex to parallel the existing right-of-way, with the possible exception of a future southerly displacement within the Soldotna Airport Easement Area. An archaeological survey of this proposed route was conducted during September and centerline posting completed early October.

Although this region experienced a 15% population growth, the demand for electrical energy increased only 5%. Under these circumstances, HEA has decided to delay the construction of this new facility until perhaps 1985.

b. Soldotna Airport Expansion Easement: Approximately 330 acres of refuge lands immediately adjacent the Soldotna Airport were granted to the City of Soldotna under Permit No. M-184-KE, dated 8/31/84, to utilize for airport expansion and future relocation of the Funny River Road. In exchange for the easement, the FWS was granted a rent-free four acre airport lot to locate a hangar and provide tie-down space.

c. Permits granted for two existing power transmission lines: About 1953, the Federal Power Commission (FPC) issued a license to construct a 69kV power transmission line from Cooper Lake to Homer, a 69kV from Soldotna to Bernice Lake in North Kenai, and for the future development of a Bradley Lake hydroelectric project. On February 3, 1970, the existing 69kV facilities between Cooper Lake and Homer were eliminated and the operator, Chugach Electric, was advised to obtain a right-of-way permit from the "administrator of these public lands." This action was never taken by Chugach Electric or, later, Homer Electric Association. A second power line, a 115kV originating at the Quartz Creek substation near Kenai Lake connecting the Bernice Lake substation at North Kenai, was constructed in 1969. On May 1, 1969, HEA applied to Bureau of Land Management (BLM) for a right-of-way permit. On July 23, 1981, the BLM forwarded the case file on the application to the FWS. Both facilities have now been issued FWS right-of-way permits; Quartz Creek to Kasilof, a 69/115kV power transmission line under Permit E-47-KE, dated March 28, 1984; and the Quartz Creek to Bernice Lake 115kV power transmission line facility under Permit E-48-KE, dated March 28, 1984.

d. Ski Hill Substation to Sterling Highway Underground 25kV Power Transmission Facility: Construction of this 3,500 foot buried electric cable began in December under FWS permit E-170-KE, dated 11/9/84. Due to warm weather, rain and water table problems, and lack of surface support for construction equipment, this project will not be finalized until February, 1985.

3. Other

a. Native Allotments:

1) The James Showalter native allotment case file was requested from BLM in February after the relinquished allotment had been reinstated. The Showalter allotment is within Kenai Native Association lands along the Kenai River. Investigation revealed the Showalter allotment should not have been reinstated, and if reinstated, would have been invalid because of the age of the applicant. Additional action has not been forthcoming.

2) An allotment hearing, United States v. Sarah Lindgren, was held December 4-6 in the City of Kenai Council Chambers. This fact finding hearing was ordered by the Interior Board of Land Appeals as a result of an appeal by a previous BLM decision to award 111 acres of refuge land adjacent the Kenai River below Skilak Lake. Results of this fact finding hearing should be available in spring.

3) A second hearing, scheduled for December 5, U.S. v. Benjamin Lindgren, was cancelled when Lindgren failed to show. Lindgren thus defaulted and the contested 20 acres on the Dawson Point shoreline of Skilak Lake is no longer in question.

These investigations indicate the need for scrutiny of native allotment claims within established Alaskan refuges. The BLM decisions in each of these cases was questionable. The Interior Board of Land Appeals reprimanded BLM for its procedures and decisions concerning two Kenai NWR allotment cases in the fall of 1983.

4) At the request of the Skilak Lake Inholders, a small Special use Permit (SUP) woodcut area was established on the shore of Skilak Lake for use by inholders who were unable to obtain firewood from the existing permit areas. This area may be used only by inholders during an open water period to gather heat/fuel size wood. Inholders were encouraged to cut wood when it can be safely transported to Caribou Island over frozen Skilak Lake. They were also encouraged to use their own wood on the Island and to use the existing SUP program to obtain wood from refuge lands.

b. Special Designation

On June 2, 1984, Alaska Governor Bill Sheffield signed into law legislation establishing the Kenai River Special Management Area. Among other things, SB 417's purposes included:

1. Protect and perpetuate the fishing and wildlife resources and habitat in the unit;

2. Be under the management of the State Parks system; and

3. Manage recreational uses and development activities in the unit.

A segment of the upper Kenai River under FWS control and management. Except for the adjacent Sterling Highway, the river retains its natural character and productivity. (7/84, RLD)

Portion of the Lower Kenai River under adjacent private ownership. It is these density developments and resulting heavy powerboat usage on the river which resulted in the Alaska Governor's action to designate the Kenai River as a Special Management Area under a single agency's jurisdiction, the Alaska State Parks Division.
(7/84, RLD)

D. PLANNING

1. Master Plan

The final Kenai Comprehensive Conservation Plan, Wilderness Review and EIS was completed and will be printed in early 1985 and is scheduled for public release in March. Hopefully, it will receive approval shortly after the 60-day adverse comment period expires in April. Based on the public comments received on the draft plan, the following major changes were made in the final plan:

1. The section dealing with acquisition of inholdings was rewritten to reflect current Service policy and to incorporate the "willing seller" concept;

2. The "accessible wilderness" management category was eliminated and aircraft access areas were identified within the wilderness management category;

3. Areas in minimal management were clearly identified as the areas recommended for designation as wilderness in each alternative;

4. Sections of the wilderness review previously found in the Technical Supplement were added to the text of the plan, which now constitutes the complete Wilderness Review document for the Kenai Refuge;

5. The special values section was expanded to include the Chickaloon Watershed and Estuary, the Lowland Lakes and Canoe System, and the Skilak Loop area; and

6. The Chickaloon Flats were identified as a separate habitat class--Estuary--with its own representative species, the lesser Canada goose.

In addition to these changes in the draft plan, the following changes have been made in Alternative C, which was reaffirmed as the Service's preferred alternative:

1. The proposed Skilak Loop Special Management Area would be managed to provide enhanced wildlife viewing opportunities;

2. The proposed closure on the upper Kenai River would be moved one mile downstream from the mouth of the Russian River;

3. The Chickaloon Watershed and Estuary would be placed in minimal management and recommended for designation as wilderness; and

4. The outlet of Tustumena Lake would be placed in minimal management and recommended for designation as wilderness.

In addition to revising the plan, written responses to public comments were prepared. Formal comments were prepared for 39 letters from a total of over 460. Comments were also prepared on testimony given at the Anchorage,Homer, Seward, and Soldotna public meetings. The public comments and the USFWS response to those comments (250 pages) will be printed and distributed with the final plan. (See Appendix 1 and 2.

2. Management Plan

Most of the step down management plans were delayed pending completion of the Kenai NWR CCP. However, drafts of the Wildlife Inventory Plan, Trapping Plan, Wilderness Plan, Kenai Fire Plan, Sign Plan, and Oil and Gas Plan were begun this year. The long list of step down plans scheduled for completion in 1985 and thereafter for implementation of the CCP guarantees planning will continue to be a major staff activity for the next several years.

3. Public Participation

The draft Kenai National Wildlife Refuge Comprehensive Conservation Plan, EIS, and Wilderness Review was completed and released for public comment in late January 1984. An Open House was held at the Refuge February 26, to discuss the plan with the public. The initial 60-day comment period was extended 30 days in response to a request from the State of Alaska and several other organizations for additional time to more thoroughly review and comment on the draft plan. During the 90-day comment period, the Service received over 460 written comments from local, State, and Federal agencies, industry, local interests, conservation groups, and other interested parties and individuals. Included in these were two petitions, one supporting the closure of the upper Kenai River to motorboats; the other opposing the closure of the Skilak Loop area to hunting and trapping.

In addition, public meetings on the draft plan were held in Soldotna on February 28, in Homer on February 29, and in Seward on March 1. A formal public hearing was also held in Anchorage on March 6. The three public meetings and the public hearing were attended by 190 people, with 62 making oral statements.

Public meetings, held to comment on the draft Kenai CCP, were well attended with 62 people giving testimony. (2/85, EEB)

Table 2 provides an overview of public comment for the plan's alternatives, as well as several major issues dealt with in the plan. Figure 1 graphically displays the relative of support for the alternatives by various organizations, agencies, and the residents of different geographic areas. In using both Table 2 and Figure 1, it should be remembered that support of Alternative B reflects increased interest in management emphasis on moose and habitat manipulation, increased opportunities for timber harvest and oil and gas leasing, higher levels of motorized access, and less emphasis on minimal management or wilderness values. Support of Alternative E generally reflects an emphasis on natural diversity with fewer opportunities for habitat manipulation, timber harvest, oil and gas leasing, reduced levels of motorized access and increased emphasis on minimal management and wilderness values.

Table 2. Analysis of public comments on the draft plan.

Comments From	#	Alternative Supported					NCIA[1]	No Pref.[2]	Cannot Support[3]	Violates ANILCA[4]	Viewing Area[5]	Kenai River[6]	Acquire Inholdings[7]
		A	B	C	D	E							
Written Comments													
Soldotna	59	17%	34%	7%	12%	8%	2%	19%	2%	—	15%S 32%O	17%S 7%O	2%S 20%O
Kenai	42	12%	14%	10%	26%	10%	5%	19%	5%	—	29%S 14%O	24%S 0	2%S 12%O
Sterling	9	22%	33%	11%	11%	—	—	11%	11%	—	11%S 22%O	11%S 11%O	0 11%O
Kasilof	13	8%	23%	8%	15%	39%	—	8%	—	—	8%S 23%O	8%S 0	0 8%O
Coopers Landing	12	58%	—	—	—	—	—	42%	—	—	0 0	8%S 67%O	0 0
Homer	14	—	7%	29%	14%	35%	—	14%	—	—	14%S 7%O	14%S 0	7%S 7%O
TOTAL-KENAI PEN.	157 (34%)	16%	21%	9%	17%	14%	2%	20%	3%	—	17%S 20%O	17%S 8%O	2%S 14%O
Anchorage	72	4%	6%	11%	4%	10%	17%	44%	13%	—	28%S 7%O	19%S 8%O	0 18%O
TOTAL-ALASKA	273 (58%)	11%	17%	8%	12%	13%	8%	30%	5%	—	21%S 17%O	17%S 7%O	1%S 17%O
Lower '48	152 (33%)	—	—	2%	17%	13%	15%	11%	1%	42%	19%S 0	10%S 0	0 3%O
Organizations	43	5%	21%	14%	9%	7%	14%	23%	5%	—	28%S 23%O	26%S 5%O	2%S 14%O
TOTAL-ALL COMMENTS	486	7%	12%	7%	13%	12%	11%	23%	4%	14%	21%S 12%O	15%S 5%O	1%S 12%O

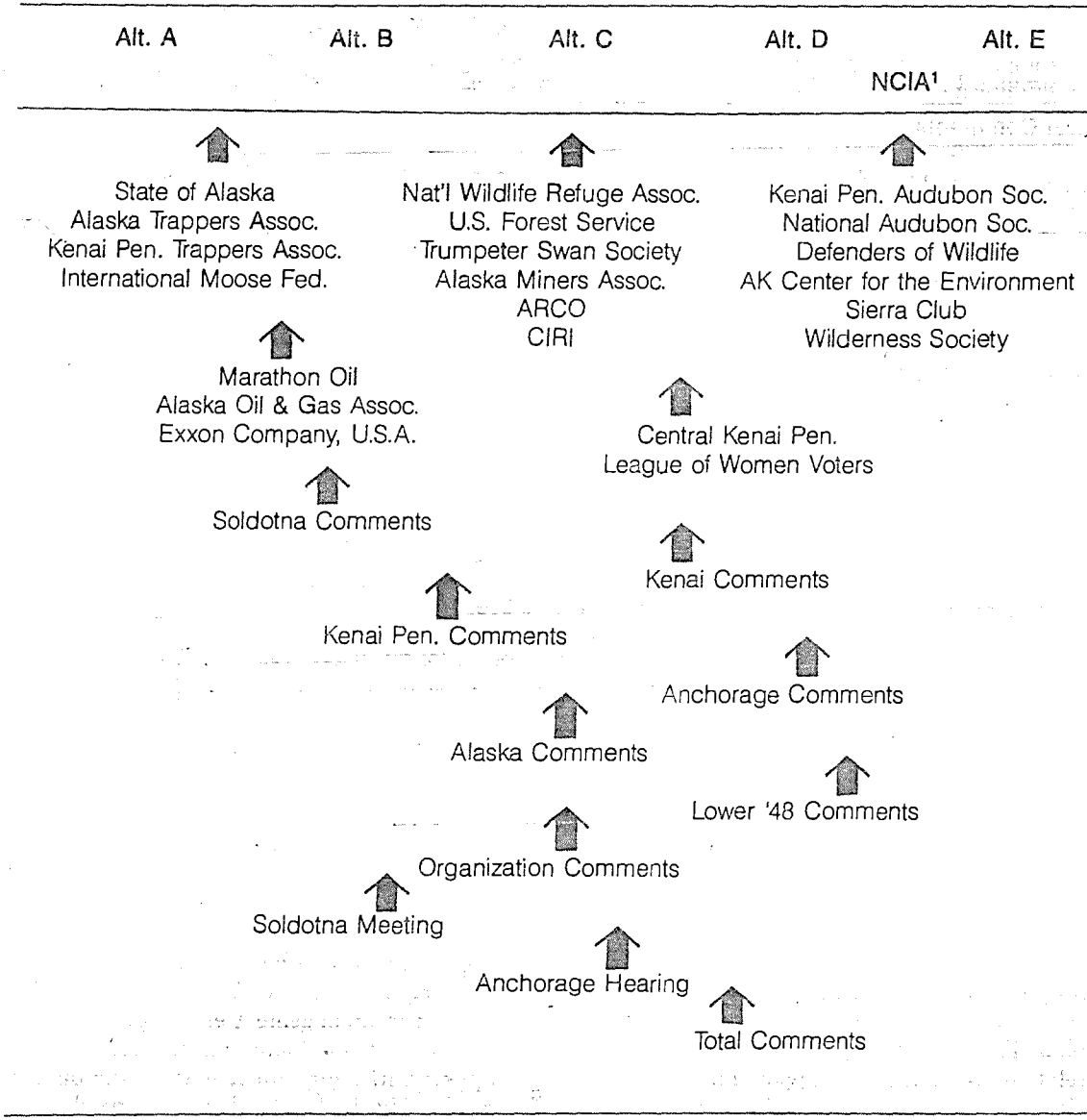
Table 2. Analysis of public comments on the draft plan (continued).

Comments From	#	Alternative Supported A	B	C	D	E	NCIA[1]	No Pref.[2]	Cannot Support[3]	Violates ANILCA[4]	Viewing Area[5]	Kenai River[6]	Acquire Inholdings[7]
Oral Comments													
Soldotna Pub. Mtg. 17	—	29%	6%	24%	—	—	35%	6%	—		18%S 47%O	35%S 0	6%S 6%O
Homer Pub. Mtg.	4	—	—	25%	25%	75%	—	—	—	—	25%S 0	0 0	0 0
Seward Pub. Mtg.	6	—	66%	—	—	—	—	33%	—	—	0 83%O	0 0	0 0
Anchorage Hearing	35	14%	9%	11%	6%	9%	17%	49%	3%	—	31%S 26%O	31%S 14%O	0 3%O

[1] Audubon's National Conservation Interest Alternative.
[2] Respondent indicated no preference for a particular alternative.
[3] Respondent could not support any of the alternatives.
[4] Respondent felt the preferred alternative violates ANILCA.
[5] Respondents who specifically indicated either support for (S) or opposition to (O) the proposed Skilak Loop viewing area (does not include those who simply supported an alternative that included or excluded the viewing area).
[6] Respondents who specifically indicated either support for (S) or opposition to (O) the closure of the upper Kenai River to motorboats (does not include those who simply supported an alternative that included or excluded the closure).
[7] Respondents who specifically indicated either support for (S) or opposition to (O) the acquisition of private inholdings.

Table 2, provides an overview of public support for the plan's alternatives, as well as several major issues dealt with in the plan. Figure 4, graphically displays the relative distribution of support for the alternatives of various organizations, agencies, and the residents of different geographic areas. In using both Table 2 and Figure 4 it should be remembered that support of Alternative B reflects increased interest in management emphasis on moose and habitat manipulation, increased opportunities for timber harvest and oil and gas leasing, higher levels of motorized access, and less emphasis on Minimal Management or wilderness values. Support of Alternative E generally reflects increased emphasis on natural diversity with fewer opportunities for habitat manipulation, timber harvest, and oil and gas leasing, reduced levels of motorized access and increased emphasis on Minimal Management and wilderness values.

Figure 1 Relative distribution of public comments on the draft plan.



Note: Organizations/agencies are placed at or near the alternative they supported. The arrows for geographic comments represent the median-point — where half the comments fall on either side of the range.

[1] Audubon's National Conservation Interest Alternative.

5. Research and Investigations

a. Spruce Beetle Attack Relative to Host Phenology and Host Vigor Index- Investigators: Institute of Northern Forestry, Fairbanks (J.S. Hard).

Ten variable radius sample plots in a densely stocked, pole-sized, white spruce (Picea glauca (Moench) Voss) stand were sampled on the Kenai NWR on the Kenai Peninsula to determine site and host variables associated with high attack densities of spruce beetle (Dendroctonus rufipennis (Kirby). Attacks peaked during the early phase of the grand period of tree radial growth when tree basal areas were expanding at a diminishing rate, which suggests that the trees were temporarily experiencing moisture stress. New resin duct formation lagged peak spruce beetle attacks by several weeks. Higher mean attack densities occurred on the drier, colder sites, and number of attacks required to kill trees increased with tree vigor index, a measure of tree basal area growth in the last complete annual ring at breast height as a percent of tree basal area. None of the sample trees with vigor indices higher than 3.3 was killed in 1984, and attack densities were low on trees with higher vigor indices. Plot mean vigor index was inversely related to stocking of live spruce.

b. Tustumena Lake Sockeye Salmon Investigation - Investigators: USFWS Kenai Fisheries Resource Station (J. Dean and J. Friedersdorff).

Tustumena Lake is 72,000 acres in surface area and is about 20 miles long by four miles wide. Its waters are heavily glaciated. It has seven major inlet tributaries which support sockeye salmon spawning and one outlet, the Kasilof River, which flows nearly 17 miles to Cook Inlet. The lake's principal fishery resources consist mainly of sockeye salmon. ANILCA designated the entire lake and surrounding area as wilderness.

The main study techniques proposed were the experimental marking of hatchery-reared sockeye fry with oxytetracycline (OTC) to enable detection of the percent survival of hatchery fish, and the use of hydroacoustic (SONAR) gear to provide sockeye population estimates along with data on their spatial and temporal distribution. Trawling was used as the means of ground truthing hydroacoustic information.

First year work proved hydroacoustic population estimates of the juvenile sockeye salmon in Tustumena Lake were feasible. Sockeye fry in this lake have been found to act differently than those in clearwater lakes. Fry crowd near the surface during light hours and disperse to depths during dark hours. The fry were also found grouped in specific lake areas earlier in the year and more randomly distributed in the fall. In 1982, the juvenile sockeye September population was 13.6 million fish, and in 1983 it was 21.7 million fish. About 86 percent of the sockeye were age 0. Results of two 1984 hydroacoustic surveys in August and late September will not be available until early 1985.

The OTC marking procedure proved successful under laboratory conditions. However, the necessary feeding period to obtain a 100 percent mark was beyond standard State hatchery practices. Therefore, fish marking by OTC has been discontinued. A more limited fin clipping procedure is currently being used.

c. Remote and Roadside Lake Study, Kenai National Wildlife Refuge - Investigators: USFWS Kenai Fisheries Resource Station (J. Dean and J. Friedersdorff).

Lakes surveyed were fly-in and roadside lakes located in the northern half of the refuge. The refuge contains approximately 4,500 lakes. Some of these waters support substantial populations of rainbow trout, char, and salmon.

Fish abundance was determined through gill net and minnow trap catch per unit effort (CPUE). Some additional fishing with other gear types was accomplished to seek total species diversity. Chemical and physical water quality parameters measured include dissolved oxygen, water temperature, alkalinity, hardness, specific conductance, ph, phosphorus, nitrogen, lake surface area and volume, mean depth, water color, and water transparency, plus an evaluation of tributary flow and substrate. Major species of aquatic vegetation were identified along with birds and mammals present.

Twenty refuge lakes were surveyed from early June to late September. An additional 18 lakes were surveyed in 1983. Rainbow trout, the most highly prized sport fish, were found in 70% of the lakes with 32% of the lakes containing either Arctic Char or Dolly Varden. Important coho juvenile salmon rearing areas were found in 10 lakes. One lake was found to support sockeye salmon spawning. Kokanee salmon populations were identified in eight lakes.

Water quality measurements indicate lakes are typically low in fertility. Most water quality conditions were well within acceptable fish tolerance limits. A few instances of low dissolved oxygen levels were found. Statistical comparison of 1983 data indicates that Morphoedaphic Index is significantly correlated with fish abundance.

Important data on fish species, water quality, and physical features were determined for each surveyed lake. Additional fishery information for this area of Alaska was derived including rainbow trout age-growth and length-weight data. Additional investigational needs were pinpointed from current study findings.

d. Investigation of Fishery Resources in the Chickaloon River Basin, Kenai National Wildlife Refuge - Investigators: USFWS Kenai Fisheries Resource Station (J. Dean and J. Friedersdorff).

The Chickaloon River Basin is the refuge's third largest drainage with 301 square miles of mountainous and coastal plain habitat. There are some 377 miles of streams and 61 lakes in the basin. ANILCA designated 37% of the basin as wilderness.

This first year of the investigation was directed toward a general fishery survey of the entire watershed. Fish diversity and abundance were determined by counting fish from a boat and walking counts. Gill nets, minnow traps, seines, dip nets, and hook and line were used to capture fish for identification, and to obtain age, weight, and length data. Numbers and species of fish utilized by bears were counted. Water quality and physical measurements include conductivity, alkalinity, hardness, pH, temperature, flow, volume, stream width, depth, and substrate composition. Aquatic and riparian vegetation was identified.

Fishery Biologist Jack Dean measures the flow of the Chickaloon River during a Chickaloon fishing investigation field trip. (8/84, RKJ)

Field work began in early June and terminated in late September. Access to the watershed was extremely difficult. Much of the field season was spent establishing survey routes. Sections of the Chickaloon River, Mystery Creek, North Fork, East Fork and Scenic Creek were surveyed in 1984. Information on run timing and relative numbers of sockeye, pink, chinook, and coho salmon was gathered for portions of the stream network. Rainbow trout and Dolly Varden were found. Additional fish species identified included threespine and ninespine stickleback, slimy sculpin, starry flounder, and Arctic lamprey.

Helicopters were used for access to lower Mystery Creek for fishing survey. (8/84, RKJ)

Stream water fertility was generally low. Water temperatures ranged from 40° in May to 59°F in July. Flow volumes were determined during the field season on Mystery Creek and the Chickaloon River. The highest flow found at the mouth of the Chickaloon River was approximately 230 cubic feet per second.

Bear utilization of salmon was found to be high throughout their spawning migrations. The peak of bear predation appeared to occur in mid-August near the end of the pink salmon run.

e. Fish Use of Several Tributaries to the Kenai River, Alaska - Investigators: USFWS Special Studies (G. Elliott and J. Finn)

Relevant parts of the summary of the final report on this project which occurred on Beaver, Skilak and Soldotna creeks including areas on the refuge are shown below:

The three Kenai River tributaries studied during 1982 and 1983 were all used by salmon and trout for spawning and/or rearing. Coho salmon spawning was observed in each stream and juvenile coho were the most abundant and widely distributed salmonoid species found in each stream. Most of the observed chinook salmon spawning occurred in Slikok Creek although some was observed in Beaver Creek. Juvenile chinook and sockeye salmon were found rearing in the lower reaches of each stream. Rainbow trout spawning was indicated in Beaver and Soldotna creeks by the presence of recently emerged fry during July and August. Dolly Varden were found rearing in each stream. A variety of other, non-salmonoid fishes was also found in each stream. Salmon spawning intensity was highest in streams with the most gravel and highest in Slikok Creek on a drainage-wide basis. The direct input of drifting invertebrates from several wetland drainages into Beaver and Slikok Creeks was documented. This input as well as fine particulate organics and nutrients described by other investigators from similar wetland systems can be important factors enhancing stream productivity. The potential value of wetland contribution is most pronounced in Beaver Creek, the study stream with the most extensive wetland input. Slikok Creek coho production appears to be dependent on spawning within the stream. Coho production in Beaver Creek appears to be a combination of stocks that originated in the drainage as well as those that emmigrated from the Kenai River.

The role and importance of Kenai river tributaries in coho salmon production cannot be easily defined or separated from the mainstream Kenai River. Rather, the Kenai River drainage appears to be a complex system of interdependent components.

Any disruption within the Beaver Creek drainage that might reduce the rearing potential of that stream could directly affect the production of Kenai River coho stock. Indeed, some disruption may already have occurred. The culvert in Beaver Creek at the Kenai Spur Road appears to be a barrier to the upstream dispersal of juvenile coho smaller than 70 mm FL based on recapture of marked fish upstream from the road. During 1983, this represented 36 percent of the coho captured moving upstream from 14 June to 26 July and 79 percent of the coho captured moving upstream from 2 August to 4 October.

The culvert in Soldotna Creek at the Sterling Highway also appears to be a barrier to the upstream dispersal of juvenile fish. During September 1982, the catch of juvenile coho salmon and rainbow trout declined sharply in the stream above the highway while the catch below the highway continued to increase, suggesting accumulation below a barrier and upstream dispersal above the highway.

Six other Kenai River tributaries were inventoried for fish during 1983. All were used by juvenile salmon for rearing. Coho were the most frequently captured salmon species in each stream. Juvenile chinook and/or sockeye salmon were captured in low numbers in five of the streams. Juvenile coho abundance increased through the summer season in each stream, indicated primarily by the appearance of age 0 fish in the catch. The recruitment of age 0 fish appears to be a result of emigration from the Kenai River. Juvenile Dolly Varden were the most frequently captured salmonoid in Kalifonsky Creek. Dolly Varden spawning was indicated in this stream by the presence of young-of-the-year fish and suitable spawning gravel.

f. Tustumena Lake Sockeye Experiment - Investigators - ADF&G (F.R.E.D. Division).

During 1984, 17 million sockeye fry were stocked in Tustumena Lake in mid-June. Studies indicated 14.3 million smolt left the system and 231,685 adult spawners entered the system. This is an experiment to determine if spawning habitat or the rearing capacity of the lake is the limiting factor influencing sockeye production in the system. Some questions related to the project are the role of stocking fish in a wilderness lake, the impact of the additional stocked fish on other species of fish in the system, and the influence of artificial-reared fish on natural stocks of fish.

g. Hidden Lake Sockeye Studies - Investigators: ADF&G (F.R.E.D. Division).

Approximately 1.2 million sockeye fry were released into Hidden Lake on June 5, 1984, in attempt to enhance sockeye runs in the Kenai River. The highest number of returning adults were recorded in 1984 (27,832), slightly more than that documented in 1980 (27,448). Smolt outmigration was 419,797 and an additional 3,766,000 eggs were taken on October 18, 1984. An attempt was also made to document the relationship between decaying salmon carcasses and nutrient input into the lake, but the results were not yet available.

h. Creel Census: Upper Kenai and Russian Rivers - Investigators: ADF&G (Sport Fish Division).

The Upper Kenai River is that section between the Moose River and Skilak Lake outlet. The 1984 runs of king and coho salmon were slightly lower than 1983, but still above average. The greatest increase was in the coho run with 4,020 taken with 7,025 man-days of effort during the early run and 3,390 taken with 5,785 man-days of effort during the late run. A total of 687 kings were taken with 13,990 man-days of effort in 1984.

During the early run of sockeye in the Russian River, 35,880 sockeye were harvested with 29,230 man-days of effort. Early run escapement (after sport fish harvest) was 28,900. During the late run, 21,970 sockeye were harvested after 20,320 man-days of effort.

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

Trumpeter Swan investigations continued through 1984. A total of 13 adult trumpeter swans from 12 family groups were fitted with radio transmitters in order to observe the cygnets (Table 3). All were captured while moulting. Only one male was still unable to fly at the time of capture, the remaining 12 swans captured were females. Some interesting post capture behavior was observed, including movements of individuals and/or family groups to adjacent lakes and in some cases the separation of the radioed bird from their mates and cygnets.

FMO/pilot Bill Larned weighs adult female trumpeter swan prior to its release with a radio harness.
(7/84, TNB)

On October 29, the Hook Lake yearling was located with a pair and 2 cygnets on Bering Lake east southeast of the Copper River Delta. At the same time, the Doroshin Lake female was located alone on Hinchinbrook Island, southwest of Cordova; the Nest Lake female was located east of Cape Suckling with 2 other adults and 2 cygnets, and the Pepper Lake male was located alone, although there were many other swans in the area, approximately 2 miles south of the Nest Lake female

A radiotracking flight in November from Bellingham, Washington to Anchorage located the Fox Lake female alone on Big Salt Lake on Prince of Wales Island, and the Pepper Lake male near Icy Bay at Cape Yakataga without his mate or cygnets.

The Kenaitze Lake female with another adult and 4 cygnets was observed near Burlington, Washington on December 1 and 2.

We will be waiting to document how many of the radioed adults return to the Kenai Peninsula and their nesting lakes in the spring of 1985.

Table 3. Trumpeter swans banded and fitted with radio transmitters on the Kenai National Wildlife Refuge, Alaska, July 1984.

Banding Location on KNWR	Date	Age	Sex	Neck & Tarsus Band #	USFWS Band #	Radio Frequency
Beaver Lake	07/06/84	Ad	F	49VR	01199	166.350
Donkey Lake	07/11/84	Ad	F	50VR	01200	166.411
Doroshin Lake	07/12/84	Ad	F	51VR	00551	166.401
Decoy Lake	07/12/84	Ad	F	52VR	00552	166.360
Moose Lake	07/13/84	Ad	F	53VR	00553	166.521
Grey Cliff	07/18/84	Ad	F	54VR	00554	166.461
Lake NW Hook Lake	07/18/84	Sub Ad	F	55VR	00555	166.310
Curlew Lake	07/18/84	Ad	F	56VR	00556	166.450
Nest Lake	07/19/84	Ad	F	57VR	00557	166.492
N. Pepper Lake	07/20/84	Ad	F	59VR	00559	166.420
N. Pepper Lake	07/20/84	Ad	M	60VR	00560	166.470
Kenaitze Lake	07/20/84	Ad	F	61VR	00561	166.381
Fox Lake	07/23/84	Ad	F	62VR	00562	166.291

Thirteen adult trumpeter swans were radio tagged during 1984 to identify critical feeding and staging habitat on the refuge. (7/84, MFP)

j. Use of the Kenai National Wildlife Refuge's Upper Kenai River by Overwintering Bald Eagles - Investigators: USFWS, Kenai NWR: (T.N. Bailey, E.E. Bangs, M.F. Portner, and Biological Volunteers E. Kord, R. McAvinchey, E. Sharpe, C. Piaz and M. Kesterson).

In 1984, four bald eagles were successfully fitted with radio transmitters and released on the Kenai River (Table 4).

Table 4. Bald Eagles Captured and released with radio transmitters in 1984.

Date	Age	Sex	Method of Capture	Location Captured	Leg Band #	Radio Transmitter Frequency
02/10/84	Imm	-	padded foot-hold trap	Kenai R. Cooper Ck	509-51792	166.511
02/28/84	Imm	M	padded foot-hold trap	Kenai R. Cooper Ck	509-51794	166.431
released 03/07/84	Ad	F	Rehab case:had been caught in trapper's foot-hold obtained emaciated, injured foot (Feb)	Funny River Horsetrail Released: Jim's Landing	599-13319	166.331
12/07/84	Imm	F	#2 offset	Jim's Landing	599-13318	166.272

Volunteer Laurie Fenner prepares to release a radio tagged immature bald eagle on the Upper Kenai River. (11/84, TNB)

Juvenile 166.511 stayed along the Kenai River until early March, moved 1-5 km north of the Kenai River by mid-March, stayed there until mid-April and then flew north to the Swanson River near Quill Lake by 13 April. By late April, it had moved south of Tustumena Lake when radio contact was lost. No signal was detected on the northern refuge until 22 October when its signal was again detected north of the Kenai River. On 26 October, it was located on the western border of the refuge near Ermine Lake.

Juvenile 166.431 left the Kenai River immediately after release, was located once in Kachemak Bay on 23 April, and was not located again despite extensive searching until 20 December, when it was located on Caribou Island in Skilak Lake and 2 January, when it was located near Chatelain Lake.

Adult 166.331 was found by a Fish and Wildlife Protection Officer in a steel trap near Funny River Horsetrail. She was rehabilitated and released with a radio transmitter at Jim's Landing. She left the Kenai River, scavenged dead moose in the Skilak - Tustumena Benchland area from 12 March, to 13 April, disappeared from the refuge in late April, and was located on the west side of Cook Inlet on the Chuitna River on 28 June. Her signal was not detected again until 26 November. Since then, she has been located along the Killey River near Harvey Lake and South of Horsetrail Lake.

Juvenile 166.272 was located on 13 December, on the Kenai River 2 miles northeast of Skilak Lake.

Aerial surveys during the 1983-84 and 1984-5 winters as shown in Tables 5 and 6 suggest that overwintering eagle numbers along the Upper Kenai River peaked in January 1984 with a similar increase in numbers the following winter. boat surveys suggest that the aerial surveys do not account for a large number of eagles because of sightability factors (Table 7). These surveys, observations of salmon, and the limited radiotracking data indicate (1) that the Upper Kenai River provides an important wintering habitat for bald eagles in numbers well in excess of the number of eagles nesting on the refuge, (2) that this section of the river is important because it remains ice-free the longest period throughout the winter, allowing eagles to obtain food, (3) that cohoe (silver) salmon provide the bulk of the eagles overwinter diet in the area, and (4) that eagles using the river in the winter may be coming from considerable distances throughout Alaska.

Biological volunteers Mike Kesterson and Carlos Paez hold juvenile bald eagle equipped with radio transmitter as part of a study to determine movements of eagles along the Upper Kenai River. (11/84, TNB)

Table 5. Ages of bald eagles observed during aerial surveys along the Upper Kenai River, 1983-84 winter.

Month	Date	River Route Number 1 Ad	1 Juv	2 Ad	2 Juv	3 Ad	3 Juv	Total Ad	Total Juv	Total Eagles
Oct	10/28/83	4	9	2	0	4	0	10	9	19
Nov	11/25/83	25	10	20	19	4	0	49	29	78
Dec	12/22/83	44	28	30	9	6	2	80	39	119
Jan	01/19/84	66	36	26	43	14	16	106	95	201
Feb	02/13/84	26	11	8	8	22	13	56	32	88
Mar	03/15/84	23	11	3	0	6	3	32	14	46

River Route No. 1 - Moose River confluence to outlet of Skilak Lake
River Route No. 2 - Skilak Lake Inlet to Russian River confluence
River Route No. 3 - Russian River confluence to Kenai Lake

Table 6. Ages of bald eagles observed during aerial surveys along the Upper Kenai River, October 1984 - January 1985.

Month	Date	River Route Number 1 Ad	1 Juv	2 Ad	2 Juv	3 Ad	3 Juv	Total Ad	Total Juv	Total Eagles
Oct	10/23/84	3	1	5	5	2	0	10	6	16
Nov	11/26/84	25	16	10	5	8	0	43	21	64
Dec	12/13/84	38	48	7	17	3	1	48	66	114
Jan	01/18/84	106	45	9	4	40	10	155	59	214

River Route No. 1 - Moose River confluence to outlet of Skilak Lake
River Route No. 2 - Skilak Lake Inlet to Russian River confluence
River Route No. 3 - Russian River confluence to Kenai Lake

Table 7. Comparison of selected boat and aerial surveys of bald eagles along the same area of the Upper Kenai River, 1983-84 winter.

Month	Aerial Survey Date	Aerial Survey Number	Boat Survey Date	Boat Survey Number	Percent Observed During Aerial Survey
Nov	11/25/83	35	11/18/83	36	97%
Jan	01/19/84	102	01/19/84	207	49%
Mar	03/15/84	34	03/14/84	110	31%

k. Moose Movement and Distribution in Response to Winter Seismological Exploration on the Kenai National Wildlife Refuge, Alaska - Investigators: E. Bangs, T. Bailey, and M. Portner.

The remaining moose collared in 1980 continued to be monitored throughout 1984. The Telonics radiocollars have been functioning for over four years without failure although some batteries finally died this winter. Field work consisted primarily of mortality monitoring and checking the timing of migratory movements. Mortality patterns show 21 mortalities out of 59 tagged moose: eight hunting (7 bulls 1 cow), five auto accidents, two accidents (broken leg, mud hole), two probable poaching, two predation by brown bear and two cows died last spring apparently from "old age"; one was 22, the other 20 years old. Migrating moose continued to move into early successional stage forest in late September, early October. Some moose moved out of early successional forest in January, others moved in March. Two papers were presented at the 20th North American Moose Conference held in Quebec City, Quebec. The papers were entitled "Bull Moose Behavior and Movements in Relation to Harvest on the Kenai National Wildlife Refuge" and "Early Moose Season Hunting and Harvest Patterns as They Affect Moose Social Structure on the Northern Kenai National Wildlife Refuge, Alaska."

l. Kenai Peninsula Interagency Brown Bear Study - Investigators: ADF&G (C. Schwartz), USFS (K. Nelson), USFWS (E. Bangs).

Negative impacts on local brown/grizzly bear (Ursus arctos) populations and the increased occurrence of human/bear conflicts resulting from accelerated human activities on the bear's range are well documented in literature. The Kenai Peninsula is undergoing rapid land use changes, resulting in increased use of it's resources by humans. The Fish and Wildlife Service initially proposed a study on the refuge in 1983 to gather baseline information on this brown bear population. This information would be used to make management recommendations to mitigate potential negative impacts to bears and reduce bear/human conflicts on the peninsula.

On January 6, 1984, representatives of the USFWS, U.S. Forest Service (USFS), and the Alaska Department of Fish and Game (ADF&G) met at refuge headquarters to discuss this proposal. An interagency brown bear study team (IBBST), composed of Ed Bangs (USFWS), Kurt Nelson (USFS), and Chuck Schwartz (ADF&G), was formed.

During subsequent meetings, the IBBST determined information needs and discussed logistics and time frames required for studies of various intensities. They developed a step-down plan which outlines information needs, and the strategies necessary to gather this information. The group decided that a limited effort to locate and radiocollar bears would be conducted during the summer and fall of 1984. This information effort would then help to determine the feasibility of developing a more intensive study the following year. They also decided that an extensive

survey should be conducted by technicians to gather background information pertaining to Kenai Peninsula brown bears through literature searches, interviews, and aerial and ground surveys of known and suspected brown bear high use areas. Field efforts would be concentrated along salmon spawning areas. The technicians would be funded by the USFS and USFWS. A memorandum of understanding was endorsed by the three agencies in July, 1984.

The objectives of the 1984 field season were:

1. To establish a file of pertinent brown bear literature and to review this literature for information applicable to the Kenai Peninsula Brown Bear Step-Down Plan. ✓

2. To contact biologists and conduct interviews with local residents to obtain information pertaining to the Kenai Peninsula Brown Bear Step-Down Plan.

3. To conduct aerial searches of salmon streams and alpine areas within the central portion of the Kenai Peninsula to locate brown bears and to identify important brown bear use on these areas.

4. To conduct ground surveys of areas on the Kenai Peninsula which are known or suspected brown bear use areas and to document brown bear use of these areas.

5. To centralize information on past and present brown bear distribution, salmon abundance and distribution, and present land status on the Kenai Peninsula.

6. To monitor human use and human/bear encounters within a recreation area on the Kenai Peninsula (the Russian River/Resurrection River trail system) receiving heavy use by both humans and bears.

7. To attempt helicopter capture and radiocollaring of brown bears along salmon streams and alpine areas.

All objectives were met in 1984 and are summarized in a progress report prepared by USFS Technician John Bevins and other team members. The USFWS funded and had primary responsibility for the aerial survey and helicopter capture aspect of the study (Table 8). Based upon the limited success of both aerial surveys and brown bear capture efforts, the feasibility of the brown bear capture portion of the study will continue through the 1985 field season. The procedures used to address other study objectives will also continue through the 1985 field season.

WB Ed Bangs with the first female brown bear collared during the interagency bear study.
(7/84, CCS)

Table 8. Brown Bear Aerial Surveys on the Kenai Peninsula, Alaska, 1984.

Date		Hours	Bears Observed	Habitat	Average Bears/hr.	Notes
July 6	P.M.	2.9	3	2 Alpine 1 Stream		
July 13	P.M.	1.0	0			
July 18	P.M.	1.5	2	2 Alpine		
July 20	P.M.	1.0	8	8 Stream		
July 25	P.M.	2.4	6	6 Stream		
Subtotal		8.8	19		2.16	
August 3	P.M.	3.3	4	4 Stream		Female .001 darted but lost sow in brush.
August 3	P.M.	4.3	0			
August 7	A.M.	2.0	3	3 Stream		
August 8	A.M.	3.0	3	3 Stream		
August 9	A.M.	3.9	6	6 Stream		Darted one 2-1/2 yr old .002.
August 20	P.M.	2.3	6	6 Stream		
August 22	A.M.	2.8	3	3 Alpine		
Subtotal		21.6	25		1.16	
September 10	P.M.	3.5	0			
September 22	P.M.	2.5	1	1 Alpine		Boar .035 darted, no tattoo
September 24	P.M.	4.0	0			
September 25	P.M.	2.5	0			
Subtotal		12.5	1			
October 16	P.M.	2.2	3	3 Stream		
October 17	P.M.	1.5	1	1 Stream		
October 26	P.M.	1.7	0			
Subtotal		5.4	4		0.74	
Total				41 Stream 8 Alpine		

TOTALS - 19 Flights, 48.3Hrs, 49 Brown Bear = 1.01 bear/hour

Brown bear were difficult to locate and capture on the refuge despite their "supposed" abundance.
(7/84, EEB)

m. Wolf-Lice Investigations on the Kenai National Wildlife Refuge - Investigators: USFWS Kenai NWR: (M. Hedrick, T. Bailey, E. Bangs), and ADF&G: (T. Spraker)

Twenty-two wolves from four different packs on the refuge were captured, examined for lice (Trichodectes canis) during 1984. Twenty-one were ear tagged and/or radio collared, injected with Ivermectin, and released (Table 9). Another wolf with lice from the Point Possession Pack was treated in November 1983. In addition, pups from the Elephant Lake pack were examined in June and two were taken by Alaska Department of Fish and Game for lice infestation study purposes. By the end of the 1983-84 winter, wolves from at least three packs on the refuge (Point Possession, Swanson River and Skilak Lake) and one pack off the refuge (a small pack near Hope) were known to have lice. All captured wolves were treated with Ivermectin and released and Ivermectin-treated baits were dropped from aircraft near several kills particularly in the Point Possession pack's area.

By late fall of 1984, wolves with lice were still being taken by trappers, but only in the Point possession area. Wolves taken from the Swanson River, Bear Lake, and Skilak packs did not have lice.

Because there are radiocollared and eartagged wolves that cannot be accounted for, there is a high probability that wolves from packs with lice will disperse to other areas. For example, one wolf from the Swanson River Pack was later trapped in 1984-85 in the Caribou Hills area. Two wolves with lice were later taken (in February, 1985) in the Caribou Hills area. Although attempts will be made in 1985 to document the presence or absence of lice in selected packs and wolves will be radiocollared in order to determine pack and territory size, the full success of the treatments will not be known for at least another year. In the meantime, more cases of the same parasite in domestic dogs on the Kenai Peninsula and elsewhere in Alaska have been reported by veterinarians.

Biological volunteer Liz Sharpe with immobilized wolf. Monitoring of radiocollared wolves is the more reliable method of determining the size of the northern refuge's wolf population. (7/84, TNB)

Table 9. Wolves captured and treated with Ivermectin on the Kenai NWR during the winter, 1983-84.

Date	Color	Sex	Age	Pack	Lice	Radio
11/22/83	grey	F	Pup	Pt. Possession	yes	150.590
02/13/84	black	F	Adult	Skilak Lake	yes	150.211 (old) 164.611
02/13/84	gray	M	Pup	Swanson River	yes	164.151
02/13/84	gray	F	Yearl.	Swanson River	yes	164.251
02/15/84	gray	M	Adult	Swanson River	yes	164.690
02/15/84	gray	F	Pup	Swanson River	none found (probably)	164.140
02/26/84	gray	F	Adult	Skilak	no	164.650 (old) (sn 7806)
02/26/84	black	F	Pup	Skilak	yes	164.500
02/26/84	black	F	Pup	Skilak	yes	164.600
02/24/84	bk/gr	F	Yearl.	Not Tagged	?? probably retagged	
03/03/84	gray	F	Yearl.	Pt. Possession	none noted	150.590
03/03/84	gray	F	Pup	Pt. Possession	yes	Ear tag 867 & 868
03/03/84	gray	M	Pup	Pt. Possession	yes	Ear tag 2045 & 2046
03/02/84	gray	F	Adult	Pt. Possession	yes	164.550
03/02/84	gray	M	Adult	Pt. Possession	yes	164.325
03/02/84	gray	M	Yearl.	Pt. Possession	yes	Ear tag 2033
03/02/84	gray	F	Adult	Pt. Possession	yes	Ear tag 840 & 841
03/02/84	gray	M	Yearl.	Pt. Possession	yes	164.492
03/08/84	gray	M	Yearl.	Elephant Lk	none	164.476
03/08/84	gray	F	2-Yr.	Pt. Possession	yes (Snare cut throat Sacrificed)	164.540
03/08/84	gray	M	Adult	Skilak	yes	164.080 (old) 164.880
08/28/84	gray	M	Adult	Pipeline	no	164.780
08/26/84	gray	F	2-Yr.	Pipeline	no	164.431
23 wolves				4 Packs		18 Radiocollars

n. Lynx and Snowshoe Hare Investigations - Investigators: USFWS, Kenai NWR: (T. Bailey, E. Bangs, M. Portner, J. Malloy, R. McAvinchey and biological volunteers M. Kesterson, C. Paez and E. Sharpe).

Lynx and snowshoe hare investigations continued through 1984 in attempt to obtain information on the apparent poor response of lynx to abundant habitat and prey on the refuge. A summary of preliminary information as of September 1, 1984 follows:

Lynx harvest on the refuge during cyclic peak years declined over 80%, from 245 in 1973-4 to 38 in 1983-4 with fewer lynx taken despite increased trapping effort. Sixty-six percent of the harvest between

1977-84 was from remote, poorer quality habitat instead of accessible, high quality habitat. Radiocollared adult females used 50-89 km^2 areas, adult males 64-783 km^2 areas, and juveniles dispersed up to 49 km. Lowland (129m) 36-37 year-old forest and upland (346 m) transitional habitats were favored by lynx. Radiocollared lynx mortality, primarily from trapping (67%), increased from 40 to 86% during 2 trapping seasons and totaled 73,74, and 64% for juveniles, 1-2 year-olds, and adults, respectively. Snowshoe hare densities were high, up to 1000/km^2, in a 36 year-old forest, but pellet densities indicated fewer hares in transitional, 14 year-old forest, and mature forest habitats, respectively. Estimated low lynx numbers and harvest, and other data, despite abundant habitat and prey indicated a depressed population.

Lynx such as this juvenile are radiocolled and ear tagged in order to determine mortality rates, movements, and numbers on the refuge. (12/84, TNB)

Because of the depressed lynx population, the ADF&G emergency closed all lynx trapping north of the Kenai River and shortened the season from 4 months to 47 days south of the Kenai River and in GMU7 (the entire Kenai Peninsula). A census technique devised by ADF&G is currently being

evaluated by ADF&G and the USFWS, and the Service is cooperatively working with trappers to radiocollar more lynx to determine their mortality rates, incidental catch, movements, and home range sizes. By the end of the year 2 lynx north and 4 lynx south of the Kenai River had been released with radio collars.

FWB Ted Bailey with lynx prior to its release with a radio collar. Mortality rates of marked lynx on the refuge were high prior to 1984 primarily because of trapping. (12/84, MBK)

E. ADMINISTRATION

1. Personnel

Back row: Bailey, Johnston, Hedrick, Ward, Bangs, Chio, Toppa, O'Guinn, Richey, Kivi, Delaney. Front row: Boylan, Fencl, Portner, Blaylock. Missing: Larned (2/85 MFB)

1984 PERSONNEL

Permanent

1.	Robert L. Delaney	Refuge Manager	GM-13	PFT	
2.	Michael B. Hedrick	Deputy Refuge Manager	GS-12	PFT	
3.	Robert A. Richey	Asst RM Oil & Gas (Pilot)	GS-12	PFT	
4.	William W. Larned	Fire Mgmt. Officer (Pilot)	GS-12	PFT	EOD 1/9/84
5.	Michael F. Boylan	Supv. Recreation Planner	GS-11	PFT	
6.	Theodore N. Bailey	Fish & Wildlife Biologist	GS-11	PFT	
7.	Benjamin R. Chio	Facility Manager	GS-11	PFT	
8.	Richard K. Johnston	Recreation Planner	GS-09	PFT	
9.	Leslie G. Blaylock	Budget Assistant	GS-6/7	PFT	Prom 9/6/84
10.	Anne M. Toppa	Accounting Technician	GS-4/5	PFT	EOD 2/27 & Prom 12/9/84
11.	Edward E. Bangs	Wildlife Biologist	GS-09	PFT	
12.	Richard D. Kivi	Equipment Operator	WG-10	PFT	
13.	Elvin "Al" O'Guinn	Maintenance Mechanic	WG-08	PFT	EOD 2/13/84
14.	Patricia A. Fencl	Clerk/Typist	GS-03	PPT	
15.	Candace D. Ward	Park Technician	GS-06	PPT	EOD 8/20/84
16.	Cynthia K. Sanders	Clerk/Typist	GS-03	PFT	Resigned 11/30
17.	Robert P. Campbell	Maintenance Helper	WG-05	PPT	Resigned 11/2

Temporaries

				EOD	TERMINATED
1.	Mary F. Portner	Biological Tech.	GS-05/01	04/02/84	
2.	Richard McAvinchey	Biological Tech.	GS-05/08	05/17/84	08/31/84*
3.	Robert Knight III	Biological Aid	GS-04/01	05/21/84	08/17/84*
4.	William P. Eickhoff	Park Technician	GS-05/01	05/17/84	09/21/84
5.	David K. Kenagy	Park Technician	GS-05/01	02/07/84	09/30/84
6.	Karen P. Farrar	Park Technician	GS-05/01	05/17/84	09/28/84
7.	Ronald A. Levy	Park Technician	GS-05/01	05/17/84	09/21/84
8.	Donna M. Bartman	Laborer-Intermit.	WG-03/02	04/30/84	10/05/84*
9.	Albert "Bud" Marrs	Laborer	WG-03/03	04/05/84	10/29/84
10.	James Farrar	Laborer	WG-03/01	05/17/84	09/28/84
11.	James Travelstead	Laborer	WG-03/01	04/30/84	09/21/84
12.	Peter Stortz	Soc. Serv. Asst-YCC	GS-05-10	05/29/84	06/08/84
13.	Candace Ward	Soc. Serv. Asst-YCC	GS-05/01	05/29/84	08/19/84
14.	Douglas Emery	Soc. Serv. Asst-YCC	GS-05/01	05/31/84	08/10/84

*Resigned

YCC Enrollees

EOD 06/10/84

1. Shirley Backus
2. Rebecca Bailey
3. David Bear
4. Lisa Congdon
5. James Edelen
6. Janet Egbert
7. Suzette Gillespie
8. Ken Grimes-Crew Leader
9. Paul Larsen
10. Michelle McCown

Terminated 8/04/85

11. Troy Minogue
12. Alfred Orth
13. Dave Titus
14. Jennifer Wardell
15. Amber Spearin
16. Victor See
17. Michael Mitchell
18. Dean Carignan
19. Shannon Jones*
20. Emily Satathite*

*Both enrollees received minor knee injuries during the first week of camp preventing continued work in the field on the canoe systems, etc.

During 1984 the Kenai NWR added one new permanent full-time position, Fire Management Officer/Pilot. William W. Larned transferred into this position effective January 9, 1984. He reported for duty at the Kenai NWR on March 30, 1984 from Jacksonville, Florida after attending the 12 week basic Federal Law Enforcement Training Center (FLETC) in Glynco, Georgia. Attending FLETC at Glynco prior to his move saved the Government approximately $1,500. Bill's family arrived June 27, after his children completed the school term in Florida.

Candace Ward, a temporary Social Services Assistant (YCC Group Leader) was selected for the new permanent part-time Park Technician position effective August 20, 1984. This position took nearly 2 years to fill due to the various hiring problems encountered.

Elvin "Al" O'Guinn was hired effective 2/13/84 to fill the vacant Maintenance Worker position.

Anne M. Toppa was hired effective 2/27/84 to fill the vacant Accounting Technician position.

Budget Assistant, Leslie Blaylock was promoted from a GS-6 to a GS-7 effective 9/6/84 and Accounting Technician, Anne M. Toppa was promoted from a GS-4 to a GS-5 on 12/9/84.

Robert P. Campbell, Maintenance Helper, resigned on 11/3/84 to go into business for himself operating a mobile tire changing firm. Cynthia Sanders, Clerk/Typist resigned effective 11/30/84 to seek employment for higher pay.

During the past three year period, a larger and larger role of expanding refuge administrative functions from office duties to biological studies have been met through an aggressive volunteer program. This becomes obvious by a review of staffing in Table 10. We are, however, at the point that additional permanent or temporary staff will be necessary to adequately plan and supervise any additional volunteers.

Table 10. Staff Breakdown from FY 1978 to FY 1984.

	Permanent		Vacant as of 12/31	Temporary	Volunteers
	Full-Time	Part-Time			
FY80	13*	1	2	5	0
FY81	13*	1	2	3	1
FY82	12	1	1	5	12
FY83	12	2	2	16	26
FY84	14	3	1	14	25

*Includes career seasonal positions.

2. Youth Programs

Kenai's YCC program in 1984 reached an all-time high in terms of budget and enrollees. This year's budget was $42,693, compared to last year's $28,693. Whereas we hired 15 enrollees last year, 20 were on board at the start of the season, although only 18 finished the entire eight weeks (two voluntarily resigned due to knee injuries which could have become seriously aggravated by backcountry labor). Total food bill for feeding 18 teenagers and three adults for eight weeks was $3,360, which averaged $5.27/person/day. Considering Alaskan costs, food was an extremely well-budgeted item. Another $1,200 was spent on much-needed equipment. Due to the remote wilderness of Kenai's YCC projects, it is extremely important that these young people be provided with good food and sound equipment -- their lives could depend on it.

As in the past, the travel time required to reach distant work sites on a 2 million acre refuge means that a special work schedule is essential. A 9-to-5 Monday-Friday work week for YCC at Kenai would allow then enough time to reach the site, unpack, eat lunch, and start home. As a result, Kenai's YCC'ers, although technically "non-residential" work and live on the refuge for 10 days, then get four days off.

The YCC'ers eight-week session is divided into three of these 10 on/4 off sessions with a shortened four-day session at the end. Enrollees and staff preferred this and the continuity afforded long-term work projects made such a schedule in the interest's of the refuge.

This year's three 10-day "spike camps" consisted on (#1) three days at the refuge environmental education camp, followed by seven days at lower Ohmer campground; (#2) ten days on Headquarters Lake working on cross-country ski trails; and (#3) ten days in the Swanson River canoe trails repairing portages, etc.; and finally, (#4) a 4-day spike at Hidden Lake campground.

The emphasis of YCC work projects in 1984 was campground and trail maintenance. By summer's end, enrollees had brushed, corduroyed, gravelled, removed stumps, widened, and leveled some 50 miles of trail. They also cleared fire pits and did general campground maintenance in half-a-dozen campgrounds and built portages and ramps at eight strategic locations along the canoe trails.

1984 YCC proudly display the last of 20 spruce stumps chopped out by hand during a cross-country ski trail project. (7/84, DWE)

In addition to work projects, environmental awareness was an important "official" component of this year's camp after being an extra-curricular activity last year. Environmental awareness field trips in 1984 included: a tour of Alaska's oldest producing oil field, the Swanson River Field; a wildlife lecture/slide show by refuge biologist Ed Bangs; field trip to see spawning salmon at Russian River falls led by an Alaska Department of Fish & Game fisheries biologist; gold panning/Alaska history field trips led by a local "sourdough"; Kenai River float trip and a trip to the ADF&G Moose Research Center on the refuge. In addition to these activities, evening sessions using refuge EE materials including Project WILD and GREEN BOX added to the education effort. But, as the YCC's final report states, "close encounters with loons, eagles, beaver, land otters, and wolves, followed by sharing discussions provided the most meaningful education moments."

1984 YCC observe migrating red salmon jump Russian River Falls as an environmental education activity. (7/84, DWE)

The major problem for this year's YCC camp was the same which faced last year's, namely, lack of staff. For the past two years, positions have been advertised so late and for such a short time that only a handful of qualified persons apply. In 1984, the problem was compounded by OPM

changing the job title from YCC Group Leaders to Social Services Assistants. By the time we contacted the half-dozen names on the list of eligibles only two were still available. Fortunately, both were exceptional employees who weren't interested in accepting other positions. Doug Emery, local junior high teacher, and Candace Ward, who would later become Kenai's permanent park technician, provided stable, responsible leadership for YCC all summer. As happened in 1983, one of our volunteers stepped forward to fill-in as the third staffer. Sara Krejcha had a degree in environmental education and proved an exceptional group leader all summer. Since we could not pay her other than the $10/day subsistence rate volunteers receive, at summer's end Sara received a $500 honorarium from Alaska Natural History Association

profits in recognition of her exceptional efforts. This is the second year a volunteer has served as a YCC group leader. This annual dilemma is a symptom of the year-to-year nature of YCC funding. It is essential that we advertise our YCC positions sufficiently early to get adequate numbers of applicants and then have sufficient time to select from that list. YCC staff positions are much too critical to be left to chance. The YCC program at Kenai has been our best public relations effort as well as strengthening our ties among local teachers, counselors, students, and parents. In an area of high seasonal unemployment where the few summer jobs are often taken by transient college students, it is vitally important that local high school students have an opportunity for meaningful summer employment.

4. Volunteers

Kenai's volunteer program offers persons interested in working on the refuge two options. Local volunteers are the backbone of our program; these persons are required to contribute at least 16 hours a month. In return for their services, they receive 1) an honorary membership in the Alaska Natural History Association good for a 15% discount on all books, cards, posters, etc. sold at cooperating association outlets throughout Alaska; 2) free admission to adult education courses offered at the refuge; 3) uniform provided by the refuge; 4) complimentary Kenai NWR T-shirt; and 5) periodic "volunteer appreciation night" with awards, free pizza, soft drinks, and certificates.

Volunteer Cynthia Paxon provides information to refuge visitor. (4/84, DKK)

Our other category of volunteers consists of "seasonal" volunteers who are required to contribute 40 hours a week for at least three months. We are able to provide these volunteers with free housing in a four-bedroom, two bath home adjacent to the headquarters/visitor center as well as $10 a day per diem travel allowance since these persons are from outside the local area. Since Alaska is a mecca for budding natural resources professionals, Kenai is able to attract highly-qualified persons with a variety of educational backgrounds and experiences.

Volunteer Mechanic Rey Gibson keeps our equipment running in good condition. (8/84, BRC)

During 1984, Kenai had 34 volunteers on duty. Of these, 10 were "seasonal" volunteers who contributed 40 hours a week while 24 local volunteers contributed at least 16 hours each month. By year's end, these people had totalled over 13,000 hours or the equivalent of more than six years of work on the refuge in duties such as visitor information, hiking and ski trail maintenance, youth programs, biological research, geological surveys, and vehicle maintenance. Special volunteer projects included clean-up of the canoe trails, selected refuge cabins, and the headquarters entrance road by local scouts. After the latter, they were rewarded with a pizza party and waterfowl identification class.

Outdoor Recreation Planner Boylan spent a week in Washington with other field persons assisting National Volunteer Coordinator Irene Magyar in preparing a FWS Volunteer Handbook for distribution in 1985. Also in 1984, Kenai contracted with the Student Conservation Association (SCA) as a source of volunteers for 1985. While we have been extremely fortunate in acquiring ample volunteers for field biology, we are short of persons trained in interpretation-recreation skills. Hopefully, our SCA alliance will provide a source of trained personnel for these areas while giving these young people a chance to participate in one of this country's most beautiful,albeit challenging resource management areas.

As 1984 closed, our volunteer orientations had a new look as the Kenai Volunteer Handbook made its debut. Compiled by Park Technician Candace Ward, the handbook alphabetically lists major subject areas volunteers need to know about to answer the public's questions. It should provide a handy reference for our visitor information personnel and help them to understand the myriad programs, activities, policies, and regulations that comprise Kenai NWR.

5. Funding

Table 11 displays Kenai's funding and manpower status from FY 1980 through FY 1984.

Table 11. Kenai National Wildlife Refuge funds and position patterns - FY 1980 through 1984.

FISCAL YEAR	1980	1981	1982	1983	1984
PERSONNEL					
PFT Positions	9	9	12*	12	14
Vacant PFT 12/31	5	5	10	10	8
P-Career Seasonal	4	4	0	0	0
PPT Positions	1	1	1	2	3
Vacant PPT 12/31	0	0	3	2	1
Temporary	5	3	5	16	12
Temp. Intermittent	2	0	0	0	1
YCC Staff Positions	0	0	3	3	3
Vacant YCC Staff			1	1	1
YCC Enrollees	0	0	13	18	20
YACC Camp	2-10	5-22	0	0	0
Volunteers	0	1	12	26	25
O&M FUNDS					
MB	71,000	92,000	145,000	290,000	
MNB	296,000	297,000	334,000	439,000	936,000**
I&R	191,000	190,000	190,000	241,000	
Fisheries	0	0	0	0	10,000
Exp. for Sales	37,000	49,000	55,000	54,000	62,000
Subtotal	595,000	628,000	724,000	1,024,000	1,008,000
OTHER FUNDS					
I&R-Fee Area	7,500	7,300	7,300	0	0
BLHP	75,000	1,494,000	0	0	0
I&R Fee Area Rehab	0	0	52,700	0	0
ARMM	0	0	0	40,000	264,000

*Conversion of 2 Career Season to PFT.
**MB, MNB, I&R all combined into 1260 program funds in FY 83.

Station Accelerated Refuge Maintenance Management (ARMM) funding increased significantly this year and greatly assisted in priority programs of facility and equipment maintenance. ARMM funds were used to purchase a front-end loader, a new heated storage building, a makeup/exhaust air system for the shop, and signs. ARMM funds also were used to replace three vehicles and a motor grader. The completed Kenai Comprehensive Conservation Plan identified a need for nearly 10 million dollars to rehabilitate existing facilities and an additional 8 million dollars for facility expansion and construction.

6. Safety

Safety meetings were held on a monthly basis with each staff member presenting a topic of their choice.

The dates and topics of Safety Meetings from January through December 1984 are listed below:

Date	Chairperson	Topic
01/16/84	Robert Richey	Winter Walking
02/13/84	Ted Bailey	Moods in Safety
03/19/84	Leslie Blaylock	Hearing Conservation
04/16/84	Jim Friedersdorff	Drowning - A Preventable Alaska Tragedy
05/21/84	Ed Bangs	Stress Management
06/18/84	Rick Johnston	Sound of Sound (Hearing)
07/16/84	Ben Chio	Static Electricity
08/20/84	Bill Larned	Fire Safety
09/10/84	Bob Campbell	At Home with Guns (Gun Safety)
10/29/84	Leslie Blaylock	Winter Driving
11/05/84	Dick Kivi	Hands at Work
12/17/84	Mike Hedrick	Chainsaw Safety

Safety Officer Ginny Hyatt and Chief Engineer Rudy Berus visited the refuge to inspect the vehicle shop area for possible high levels of air contaminants following complaints by several staff members of headaches and related symptoms.

Result of the safety inspection: a ventilation system heat make-up unit was installed in the maintenance shop and wood working shop.

Ginny Hyatt, Safety Officer, presented Defensive Driving, First Aid, CPR, and water safety. All summer staff and permanent employees that needed the training attended. The U.S. Coast Guard Auxiliary also presented Boating Safety. ARM Bob Richey presented Aircraft Safety.

A chain saw safety course was presented by Facilities Manager Ben Chio to three staff members including a film on chain saw operation. Students disassembled, cleaned, adjusted, sharpened chains, and reassembled chain saws. They also sawed up a tree that was blown down by high winds. Safety protection gear was demonstrated and worn.

Three maintenance staff and the Refuge Fire Management Officer were certified on safety, operation, and maintenance of the crawler/dozer, and front loader/backhoe.

Our old unsafe tire changer was replaced with a new FMC tire changer.

There were several aircraft accidents/incidents occurring on the refuge, mostly during waterfowl/moose hunting season. No injuries have been reported and all aircraft have been removed from the refuge.

There were two YCC knee injuries, while three staff members received injuries, one to his back, one an ear, and one a knee.

F. HABITAT MANAGEMENT

2. Wetlands

Eight National Wetlands Inventory Maps covering the area adjacent to the Kenai River on and adjacent to the refuge were digitized during 1984. This is part of a joint information gathering process between the U. S. Fish and Wildlife Service and the Army Corps of Engineers. This data is available on computer tapes through the IRM section of the Anchorage Regional Office. Digitized maps include the following quadrangles: Kenai B1, B2, B3, B4 and Kenai C1, C2, C3, and C4.

3. Forests

No commercial timber sales were made during 1984. Commercial timber permits may be issued in the future in certain intensive and moderate management zones but it will be de-emphasized in favor of prescribed fire and personal use firewood and houselog harvest.

Two commercial Christmas tree permits were issued in 1984 at 80¢ per tree. About 150 trees were cut along the Mystery Creek Access Road. Most local residents cut their own trees, for which no permit is required.

Personal use firewood permits were handled the same as in 1983, with two distinct seasons split by spring breakup and moose hunting season. Five hundred thirty six permits were issued in 1984, compared with 594 in 1983.

Two woodcut areas were open this year, one on Finger Lakes Road and one on Funny River Road. The Finger Lakes Road area will be closed next year as the wood supply is nearly exhausted, but Funny River Road has several remaining stands.

The Funny River Road area will eventually be combined with a slash-burning project to reduce fuel hazards adjacent to private lands.

9. Fire Management

This was the second year that the Alaska Division of Forestry provided fire protection for the refuge and surrounding lands. Detection and suppression of fires on the refuge were accomplished quickly and efficiently through the use of patrol planes and an experienced helitack crew.

The crews responded to seven fires on the refuge, totaling 14 acres. All were man-caused except for an early-June spotfire on upper Jean Lake caused by a lightening strike. Our biggest single fire was a 12-acre prescribed-burn "slop-over" which was suppressed as a precautionary measure on June 11, in the Skilak Loop area.

The major cause of wildfires on the peninsula is fireworks but we may see a change as fireworks bans are being discussed at State and local levels.

The Kenai Peninsula Interagency Fire Management Plan, begun in 1983 by a planning team led by DRM Hedrick, was completed and signed in May, 1984, and put into operation for the remainder of the 1984 fire season. The plan worked well and changes made during the annual meeting in November were limited to minor land status updates. The real test of the plan on the refuge came on September 16, when an escaped campfire was reported at Loon Lake. Loon Lake is in "modified" protection which reverted to "limited" on September 15, so the smoldering fire was monitored but allowed to burn. It was declared out on September 20, having consumed less than 0.1 acre.

Fire Management Officer/Pilot Bill Larned arrived in March after completing law enforcement training in Glynco, Georgia. Bill's first project on the refuge was planning and conducting a prescribed fire to consume 600 acres of spruce slash produced by a timber-crushing habitat improvement project in the Skilak Loop area. The burning operation and the crushing was funded by Alaska Department of Fish and Game for the purpose of fuel hazard reduction and increased browse production.

The emphasis of the 1984-85 Skilak Loop habitat improvement project was on leaving a natural-looking mosaic with islands of trees left standing for cover and edge effect. (1/84, TNB)

The prescribed burning plan was signed off in May, and the initial attempt at burning the first 300-acre unit began June 11. To insure a safe first burn a D-7 bulldozer put a 10 foot firebreak around each unit. The fire crew included refuge staff, Alaska Division of Forestry, Alaska Department of Fish & Game, the U.S. Forest Service, and the Seward Skill Center -- a real interagency effort! Unfortunately, this first attempt was discontinued when weather conditions exceeded prescription and the fire jumped the cat line and burned a few acres outside the unit.

A second attempt was made in late July using hand drip-torches instead of the helitorch used in June. Conditions were at the low end of the prescription and a lot of work produced very few burned acres the first afternoon. But next morning the sun dried the fuels and the unit responded with an excellent burn mosaic by early afternoon.

FMO Bill Larned lights the prescribed burn at Skilak Loop in late July. (7/84, MFB)

Frequent rains prevented further burning until the end of August. Three attempts were made on unit 2 but it had discontinuous spruce fuel and would not carry a fire. On August 30, the operation moved to the last unit's 150 acres of continuous spruce. This burned quickly, safely, and completely, with a crew of five refuge and five Division of Forestry personnel.

Aerial shot of the last phase of the prescribed burning program at Skilak Loop in late August. (8/84, WWL)

Overall, fuel reduction objectives were met on two of three units and effects on browse production are encouraging. The Alaska Department of Fish & Game installed moose exclosures and photographic stations to monitor vegetation changes over years. High costs (about $25/acre) revolves from extreme precautionary measures and inexperienced crew. We can burn for less than half that cost. The 1984 prescribed burn was valuable to assess building a sound fuels and habitat management program for the refuge.

Remote automatic Weather Station at Skilak Loop for prescribed burning operation. (7/84, WWL)

FMO Larned attended eight fire management courses in 1984, acting as student instructor for one. Bill was also appointed team leader for the Kodiak/Alaska Peninsula Interagency Fire Management Planning Team, whose suppression plan is due in April, 1985.

10. Pest Control

Spruce bark beetle-killed trees at Upper Skilak Campground were removed by a Special Use Permit holder between February 7, and March 30, 1984, for public safety and visual appearance purposes. About 325 spruce trees were removed from 4.5 acres.

12. Wilderness and Special Areas

In 1983, a draft Kenai Wilderness Administrative Guide was received after a six month internship by Colorado State University doctoral candidate Patrick Reed. In August, 1983, a one-year contract was awarded to Patrick Reed and Advisor, Glen Haas, Ph.D., of Colorado State University to complete the work. The contract directed research, expert review, and expansion into wilderness management concerns of Alaskan refuges.

A final draft of the "Kenai Wilderness Management Guide" (KWAG), was received in early December 1984. When approved, the KWAG will provide excellent guidance for management of the Kenai Wilderness.

Simultaneous with the development of the KWAG, a regional task force formed to amend 6 RM 8 to reflect changes in ANILCA and provide wilderness direction for Alaska. Refuge staff participated in this effort and a draft was completed. Hopefully, these efforts by the task force and the Colorado State contractor will result in a comprehensive wilderness guide for managers.

Wilderness was a primary topic of discussion when the refuge's preferred Comprehensive Conservation Plan's preferred alternative was revised. Several new minimal management areas (proposed wilderness) were included in the preferred alternative based on public input. At the top of the list was the Chickaloon Flats area, recognized as a "special value" of the refuge with wilderness being the preferred designation for protection. Other modifications made in the interest of wilderness management such as boundary adjustments and consolidation of complete ecosystems underscored the refuge's role for the future as guardian rather than gardener.

Backcountry Park Technician Dave Kenagy contributed to field work as regular wilderness patrols were conducted for the second year. While aerial reconnaissance is fairly extensive, the presence of a full time seasonal backcountry patrolman has made a significant positive impact.

Outdoor Recreation Planner Johnston and Park Technician Kenagy reviewed management of other agencies' backcountry trails. Trail policies, construction standards, and helpful hints were obtained from Denali NP, Mt. Ranier NP, Isle Royale NP, and Boundary Waters Canoe Area.

Park Technician Kenagy completed a basic cabin inventory for most of Kenai's remote cabins including color photos, floor plans, locations, structural condition, and management suggestions.

A remote cabin inventory was conducted during 1984. This cabin, located on the north shore of Tustumena Lake within Kenai Wilderness was included in that inventory. (7/84, DDK)

G. WILDLIFE

1. Wildlife Diversity

As part of the refuge's purpose of maintaining natural wildlife diversity, meetings were held with the Alaska Department of Fish and Game and a proposal was prepared to re-introduce caribou in the central or benchlands region of the refuge during the spring of 1985. Historical records and old caribou antlers revealed caribou were present in the central and southern regions of the refuge in the late 1890s and early 1900s. The last natural herd of caribou were reported in the area in 1912. Since then, caribou have been introduced in the northern refuge and have successfully become established in two herds, a Kenai Mountains upland herd and a Kenai Peninsula northern lowlands herd.

Concern about the poor response of lynx to a high snowshoe hare population, low harvest of lynx by trappers, and the information obtained during the refuge's lynx study, prompted the Alaska Department of Fish and Game to emergency close the lynx trapping season in GMU15A (the northern refuge) and shorten the season to 47 days throughout the remainder of the Kenai Peninsula. The refuge concern is that trapping pressure over the last 10 years has prevented the lynx population from naturally responding to an abundance of prey and that the distribution as well as numbers of lynx, especially on the northern refuge is being limited by man.

2. Endangered and/or Threatened Species

Notice of Review Comments were solicited for a number of mammals throughout Alaska during 1984. Category 2 candidates for the NOR on the Kenai Peninsula included the red fox (Vulpes vulpes kenaiensis), marten (Martes american kenaiensis), and wolverine (Gulo gulo katschemakensis), all of which, according to Hall and Kelson, Mammals of North America, are subspecies unique to the Kenai Peninsula.

3. Waterfowl

Snow geese arrived on the Kenai River Flats on, or about, 4 April 1984. Between 10 April and 1 May 1984, snow geese distribution and abundance were ascertained from the road crossing Kenai River. Peak numbers were observed on 20 April 1984, when approximately 4,600 geese were observed on the flats (Table 12). The most heavily used areas were NW, NE and SW of the bridge. Other waterfowl utilizing the area included Canada and white-fronted geese, pintails, widgeon, mallards and green-winged teal. The last snow geese were seen on May 1, but continued monitoring through May 11, revealed use of the flats by Canada geese and over 100 sandhill cranes. Compared to 1983, the snow geese arrived and departed the flats one week earlier.

Table 12. Snow geese and other waterfowls observed on Kenai River Flats during the spring (April 4-May 11) 1984.

	DATES															
Species	4/4	4/6	4/10	4/11	4/12	4/13	4/17	4/18	4/20	4/23	4/24	4/25	5/1	5/2	5/7	5/11
Snow Geese	6	30	62	486	1140	795	3800	4290	4571	800	576	195	69			
Canada Geese		6	33	54	118	20	40	6	33	12	142	36	100	6		
White-fronted Geese													73			
Mallards									2							
Pintails					147		400	1200	610	3000	493	210				
Sandhill Cranes									4				63	93	126	30
Bald Eagles			2			2										
Gulls					45						95	5				
Widgeon									26		8		1			
N. Harriers											2	1				
Shovelers													3			

Thirty-two pairs of trumpeter swans successfully produced broods from at least 46 nests (70%) during 1984 (Table 13). One hundred and eight cygnets in 32 broods averaged 3.38 cygnets/brood. The early brood survey in July revealed 93 cygnets in 27 broods for an average of 3.44 cygnets/brood. Ninety cygnets in 31 broods averaged 3.1 cygnets per brood during the late brood survey on 12, 17, and 21 September.

Table 13 . Locations of trumpeter swan nests and numbers of cygnets observed on the Kenai Peninsula, 1984.

Nest Location	Cygnets	Nest Location	Cygnets
N. of Kenai R.			
Tony's Lk	7	N. Pepper Lk	5
Bishop Cr	0	Moose Lk	5
Beaver Lk	4	Suneva Lk	0
Donkey Lk	2	Elephant Lk	0
Quill Lk	1	Mink Cr Lk	3
Camp Island Lk	4	Swan Cr	3
Grebe Lk	4	Moose R	2
W. of Hook Lk	5	Kenaitze-Phalarope Lk	4
SE of Finger Lks	0	Angler Lk	0
Dipper Lk (N.Dipper, E. Diamond)	3?	Chickaloon R #2	0
Warbler Lk	0	Chickaloon R #1	1
NW of Lonesome Lk	2	S of Daniel's Lk	0
Lonesome Lk	4	Doroshin Lk	1
Ck NW of Scenic Lk	5	Near Crane Lk	0
Trapper Joe	4	S of Otter Cr	0
Chickaloon R Slough	0	Curlew Lk	4
Gray Cliff	1	S of Dipper Lk (Trigger)	0
		E of Grebe Lk	1
S. of Kenai River			
Brown's Lk	5	Big Bay	3
Bay Lk	4	Windy Lk	2
Harvey Lk	5	Clearwater Slough	4
Clam Gulch Lk	4	Fox Lk	5
Pollard's Lk	1		

5. Shorebirds, Gulls, Terns and Allied Species

On July 31, 1984, and August 1, 1984, Mary Portner assisted John Trapp, Art Sowls, and Mimi Hogan (Wildlife Assistance, Regional Office), with banding glaucous winged-herring gull hybrid chicks at the Skilak Lake nesting colonies. At this time approximately 50% of the chicks were already fledged but 198 of the remaining chicks were easily captured using a Zodiac and long handled net. The chicks were fitted with yellow and black visual bands (i.e. E34) on the right leg and standarized metal USFWS bands on the left leg.

A young herring x glaueous-wing gull hybrid is leg-banded on a nesting colony in Skilak Lake to determine movement patters of gulls on the Kenai Peninsula. (7/84, MFP)

6. Raptors

Forty-seven nests of bald eagles were located in 1984 (Table 14). Thirty-seven of these were active (79%). This compares to 41 nests located in 1983, 80% of which were active. In 1982, 33 nests were located, 82% of which were active.

Table 14. Location of Eagle nests and number of eaglets/nest on the Kenai Peninsula, Alaska, 1984.

Area	Active	Inactive Nests	Eaglets
Afonasi Lk	x		2
Bear Lk		x	
Bedlam Lk		x	
Beaver Lk		x	0
Big Indian Cr	x		2 Ad, 1 Incubating
Birch Hill Coastal	x		2
Bishop Cr (3)	x	x	1
		x	
Camp Island	x		1
Campfire Lk	x		0
Camper's Lk (2)	x	x	2
Coyote Lk	x		1
Daniel's Lk		x	0 (Osprey nest)
Gavia Lk	x		2
Gene Lk	x	x	0
Kenai R (College Is)		x	
Loon-Clam Lk	x		0
Mink Cr Lk	x		0
Moose Lk	x		0
Moosehorn Lk		x	1(Red Tail Hawk using nest)
Moose R (Lowest Rid)		x	
Moose R (M.Fk Spr Tree)		x	
Moose R (M.Fk Aspen Tr)	x		3
Moose R (West Fk)	x		2
Otter Cr	x		1
Pincher Cr	x		2
Oilfield Road		x	
Sucker Lk	x		0
Suneva Lk (2)	x	x	1
Swan Lk	x		1
Torpedo Lk	x		0
Juneau Cr	x		2
Bear Cr	x		2
Harvey Lk/Killey R	x		0
Kenai R (Powerline)	x		2
Kenai R (Skilak Inl)	x		0
Kenai R (Jim's Lndg)	x		2
Kenai R (RR Burn)	x		2
Killey R (Lower)	x		0
Killey R (Upper)	x		0
Russian R	x		2
Skilak Glacial Flats	x		1
Bradley R	x		1
Clearwater Slough	x		1
Fox R (Upper)(2)	x	x	0
Nikolai Cr	x		1
Sheep Cr	x	x	2
Lower Fox R		x	

Surveys flown - May 2 and 5, 1984, June 18, 1984, and July 5, 1984.

A productivity survey on June 18, and July 5, 1984, revealed 39 eaglets in 24 nests (1.6 eaglets/successful nest or 1.05 eaglet/active nest). Active nests, discovered in new locations, include Kenai River (Jim's Landing) and Juneau Creek. Four additional inactive nests which were located in 1984, and may or may not have been checked prior to 1983 include Bear Lake, Bedlam Lake, Oilfield road and the Lower Fox River.

7. Other Migratory Birds

The Alaska Breeding Bird Survey was conducted along two routes in 1984. The Swanson River route was surveyed by FWB Ted Bailey, Bio Tech Mary Portner, and several volunteer observers on June 14. Results of the survey, as shown in Table 15, indicate the most commonly observed birds were the common redpoll (82), Swainson's thrush (56), and the alder flycatcher (43). A total of 398 birds of 36 different species were observed. For the first time, the refuge was responsible for surveying a route along the Sterling Highway and Skilak Loop Road. The survey was conducted on June 15 and 19 by Mary Portner, WB Ed Bangs, and 2 volunteers. Survey results indicate the most commonly encountered birds included the common redpoll (81), Swainson's thrush (73), and the white-crowned sparrow (43) (Table 16). A total of 500 birds of 36 different species were observed along the Skilak route.

Table 15. Birds recorded during the Alaska Breeding Survey on June 14, 1984. This is a 25-mile route along Swanson River and Swan Lake Roads.

Species	#	Species	#
Common loon	11	Ruby crowned kinglet	8
Arctic loon	7	Northern shrike	1
Sharpshinned hawk	1	Yellow warbler	2
Sandhill crane	1	Orange-crowned warbler	23
Greater yellowlegs	7	Blackpoll warbler	12
Common snipe	4	Northern waterthrush	16
Great horned owl	1	Yellow-rumped warbler	24
unid. woodpecker	4	Rusty blackbird	1
Alder flycatcher	43	Pine grosbeak	2
Olive-sided flycatcher	5	Common redpoll	82
Tree swallow	9	White-winged crossbill	9
Gray jay	3	Savannah sparrow	4
Common raven	3	Dark-eyed junco	17
Black-capped chickadee	1	White crowned sparrow	10
Boreal chickadee	1	Song sparrow	8
American robin	3	Pine siskin	1
Varied thrush	5	unid crossbill	6
Swainson's thrush	56	Bald eagle	1
Gray cheeked thrush	4	unknown	2
		TOTAL	398

Species = 36

Table 16. Birds recorded during the Alaska Breeding Bird Survey on June 15 and 19, 1984. This is a 25-mile route along the Sterling Highway and Skilak Loop.

Species	#	Species	#
Greater-yellowlegs	4	Swainson's thrush	73
unid. shorebird	2	Gray-cheeked thrush	32
Mew gull	1	Golden crowned kinglet	1
Herring gull	1	Ruby crowned kinglet	15
Herring x glaucous-winged hybrid	1	Bohemian waxwing	2
Arctic tern	2	Yellow warbler	1
Great horned owl	1	Orange crowned warbler	12
Belted kingfisher	1	Blackpoll warbler	18
unid. woodpecker	3	Northern waterthrush	1
Alder flycatcher	26	Yellow rumped warbler	42
Olive sided flycatcher	8	Rusty blackbird	1
Tree swallow	19	Common redpoll	81
Bank swallow	1	White winged crossbill	1
Gray jay	10	Savannah sparrow	12
Common raven	7	Dark-eyed junco	37
Black capped chickadee	1	White-crowned sparrow	43
Boreal chickadee	7	Song sparrow	6
American robin	9	Pine siskin	1
Varied thrush	73	TOTAL	500

Species = 36

8. Game Animals

a. Moose - Fall moose composition counts were conducted by refuge staff in the 1969 Burn (Table 17) and by ADF&G in the Skilak Loop. Bull:cow ratios in the 1969 burn were below 6 bulls/100 cows and in the Skilak Loop were about 3 bulls/100 cows, (N=78). These data reflect the decreasing number of bulls north of the Kenai River due to increasing hunter pressure despite an increasing moose population. The ADF&G and USFWS have agreed to develop a plan in FY 1985 to recommend modifications in moose harvest strategies and habitat management programs to prevent continued overexploitation of bull moose on the Kenai Peninsula, including the refuge. A winter density count was not conducted in 1984.

Table 17. Fall moose composition count data from the Finger Lakes burned area on the Kenai National Wildlife Refuge from 1978-1984. Numbers in parenthesis are the percentage of bulls in each antler-size group.

Survey Date	Sample Size	Bulls/ 100 Cows	Number Adult Bulls +114 cm	Number Adult Bulls -114 cm	# Yearlings
11/24-29/78	188	26.5	10 (33)	12 (40)	8 (27)
12/20-21/79	245	51.2	11 (13)	41 (49)	31 (37)
12/16-23/80	243	32	12 (27)	11 (25)	21 (48)
11/06/81	220	16	13 (43)	12 (40)	5 (17)
11/16-22/82	235	16	9 (27)	15 (46)	8 (25)
11/17-18/83	595	13.9	12 (23)	20 (39)	19 (37)
12/13-14/84	262	5.4	2 (20)	6 (60)	2 (20)

b. Caribou - The composition of the upland caribou herd is believed to be similar to last year, although the numbers were up to 340 animals. A 3-permit hunt for lowland caribou was rejected by the Game Board. The refuge has opposed hunting these animals since they are highly visible to the public. A large bull was poached by oilfield workers who were apprehended. One man received a $1,250 fine and 70 days in jail, his accomplice was sentenced to 120 days community service and fined $250.

c. Dall's Sheep and Mountain Goats - Dall's sheep and mountain goats were not surveyed by ADF&G on the refuge in 1984. This is the first year since surveys were started by the refuge staff in 1949 that sheep were unsurveyed. Both populations are believed to be on the upswing due to relatively mild winter weather the past 5 years. For the first time in several years dispersing mountain goats were seen in the lowlands including one photographed along the Kenai River near Sterling which is at least 28 miles from the nearest occupied goat habitat.

d. Brown Bear - The interagency brown bear team developed a strategy to build a brown bear data base on the Kenai Peninsula. The feasibility of aerial survey and helicopter capture was evaluated in 1984. The relative importance of 23 salmon spawning areas to brown bear was also investigated. The results of these activities were summarized in an annual progress report. Field work will continue in 1985. An overview of the Interagency Brown Bear team formation and efforts were presented at the 1st Alaska Interagency Bear Biology Conference and Workshop in Anchorage, December 5, 1984.

e. Black Bear - ADF&G research biologist Dr. Chuck Schwartz continued his research on black bears although his project is scheduled to wind down in 1985. Bear baiting permits were not required by ADF&G in 1984, so the refuge instituted the permit system for bear baiters. Twenty permits were issued in 1984, but less than five bears were believed to have been taken over bait. Numerous persons are believed to have baited bear without permits and many stands were built and abandoned along with bait containers and plastic bags.

f. Wolf - Poor snow cover and lack of functioning radiocollars in several packs prevented an accurate estimate of wolf numbers in GMU15A prior to the 1984-85 trapping season. Counts of pack sizes revealed at least 38 wolves in the northern region of the refuge. The Skilak Lake Pack had at least 14 wolves, the Bear Lake Pack 6, Swanson River Pack 6, and the Point Possession Pack at least 12 wolves. Numbers in the Elephant Lake pack were unknown although it is known that the pack produced a litter during 1984 in the previous year's den. Little is known about wolf packs or numbers in GMU15B and 15C. Two observations of an extremely rare white wolf were reported during 1984 in GMU 15B: one near Slikok Lake and the other near Benjamin Creek. Trappers took at least 9 of 21 radiocollared wolves on the northern refuge as of March 1, 1985. The status of 5 are unknown and 7 are assumed to be alive. Pack sizes were reduced up to 85% by trapping which continues to control wolf numbers on the refuge.

g. Beaver - A complete aerial survey of all the lakes and ponds in the Skilak Loop area was conducted on October 16, 1984 (Table 18). Five lodges with food caches were observed: Hidden Creek, Upper Ohmer, unnamed pond southeast of Hikers Lake, Engineer Lake, and the east fork of the Moose River. Four of these five lodges are road accessible and could be excellent wildlife viewing areas. In addition to the Skilak Loop area, all lakes and ponds within the Swan Lake and Swanson River Canoe Routes and 17 lakes and ponds adjacent to the Swanson River and Swan Lake Roads were aerially surveyed for active beaver lodges. These are the road accessible lakes and ponds which receive the highest public use and provide unique opportunities to view wildlife.

Change in distribution and numbers of active lodges (especially in the Swan Lake Canoe System) over the last 5 years suggest trapping may be impacting the population. We will attempt to determine how many of the active lodges observed in October 1984 were trapped in 1985 and the number of active lodges remaining in the fall of 1985.

Table 18. Active Beaver Lodge Survey, 1984.

Area	Date	Observers	Time	Active Lodges	Lakes & Ponds Surveyed
Skilak Loop	16 Oct 84	Bailey/Larned	2.4 hrs	5[1]	20
Swan Lake Canoe Route	16 Oct 84	Bailey/Larned	2.4 hrs	7	28
Swanson River Canoe Route	16 Oct 84	Bailey/Larned	2.4 hrs	6	28
Roadside Lakes	16 Oct 84	Bailey/Larned	2.4 hrs	2	17
				20	93

[1]Includes 2 active lodges on creeks (Hidden Cr. & East Fork Moose River)

Active beaver lodges such as this one are easily surveyed from the air in late fall. Most active lodges on large lakes in the refuge are trapped by trappers using aircraft. (10/84, TNB)

h. Furbearers - Refuge furbearer populations are primarily monitored by the mandatory furbearer harvest report which is a condition of the refuge's trapping permit. One hundred and fourteen permits were issued for the 1983-84 season. Harvest reports indicate that over half of the trappers obtaining permits caught furbearers (Table 19). The catch of coyotes indicated the highest number since records have been kept, probably a reflection of the high numbers of trappers and hares. Probably due to price and effort, the catch of beaver and weasel was down while the mink catch was a record high. The lynx catch was down despite an increasing prey base and trapper interest. After a five-year discussion, ADF&G finally agreed with the refuge that there was a problem and the 1984-85 lynx season was closed in GMU15A and reduced to a December 15-January 31 season over the remainder of the Kenai Peninsula. In previous years, the season ran from November 10-March 31. Trapping methods were also modified (see Sheets A and B).

Although harvest reports indicate relative changes in furbearer catch, and may provide long-term trends, they provide little information on furbearer population sizes or trends unless there are major changes. Even then, the harvest data are subject to a wide variety of opinion whether they reflect population changes and the causes of the changes.

Sheet A.

SPECIAL CONDITIONS TO CONSERVE THE LYNX RESOURCE

1. The Alaska Department of Fish & Game (ADF&G) closed the trapping of lynx in GMU 15A and established a December 15-January 31 lynx season over the remainder of the Kenai Peninsula.

2. Furthermore, as a condition of this permit, and in cooperation with ADF&G, trapping or attempting to trap lynx on the Kenai NWR north of the Kenai River, including GMU 15A and that portion of GMU 7 within the refuge, is not authorized.

3. Cubby and flag sets and traps, set within 30' of exposed baits, may not be used except in areas that are open for lynx trapping and then only during the December 15-January 31 lynx season.

4. 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 incidentally captured lynx and assist trappers in safely releasing lynx.

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

6. 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.

7. Please do everything you can to reduce the incidental capture of lynx such as setting coyote snares at least 18" off the ground, and avoiding all cat lures or lures with a strong castor base.

8. Lynx captured on the refuge during the legal season in areas open for lynx trapping, GMU 15B and 15C, December 15-January 31, will be purchased alive for radiocollaring on a willing seller basis for $300.00 per cat. Biologists will be on call 24 hours a day.

Sheet B.

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, assuming the present high snowshoe hare population "crashes" within the 1984-85 or 1985-86 winters. 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. If for some unexpected reason the snowshoe hare population remains high for the next 3 years on the refuge, and the lynx population greatly increases, lynx trapping will probably be reopened. 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.

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Table 19. Estimate of the economic value of the Kenai NWR furbearer harvest during the 1983-84 trapping season.

Species	Number Captured	Average/ Trapper	Seattle Fur Exchange Avg Price/Pelt Spring 1984	Est. Value in Dollars
Wolf	30	0.26	$189	$ 5,670
Coyote	87	0.76	27	2,349
Lynx	38	0.32	349	13,262
Wolverine	2	0.02	204	408
Marten	3	0.03	48	144
Weasel	29	0.25	5	145
Mink	268	0.35	24	6,432
Otter	18	0.16	29	522
Beaver	43	0.38	22	946
Muskrat	39	0.34	3	117
				$29,995*

114 permits were issued, 106 trappers reported
37 trappers did not trap 35%
15 trappers did, but caught nothing 14%
54 trappers caught furbearers 51%

*Probably a high estimate due to usually poorer quality fur on the Kenai Peninsula.

9. Marine Mammals

Sometime around Thanksgiving an endangered Fin Whale washed up on the beach during a very high tide above the Forelands in Cook Inlet. The 60-foot male provided the local community some excitement even though he washed up in a remote location. Refuge staff responded to several inquiries about possession of whale parts (baleen) and a request from the Pratt Museum in Homer to obtain the skull. Some baleen was removed by Marine Fisheries, the rest by unknown persons.

FWB Ted Bailey stands beisde a beached 60-foot fin whale on the shoreline of Cook Inlet near Nikiski. (11/84, Brian Bailey)

10. Other Resident Wildlife

Small mammal trapping was conducted at Willow Lake from October 2-5 (Table 20). The Willow Lake crushed area had more shrews that the uncrushed area but vole numbers were similar. The catch rate per 100 trap nights was the highest recorded since trapping began in 1977 (Table 21).

Small mammal populations have fluctuated greatly from year to year for unknown reasons.

Table 20. Small mammal trapping at Willow Lake October 2-5, 1984, 360 trap nights/area.

Area	Red-backed Voles	Masked Shrew	Vagrant Shrew	Catch/ 100 TN
Mature Crushed	55	10	2	18.6
Mature Uncrushed	57	1	0	16.1

Table 21. Average September-October small mammal trapping success on the Kenai NWR, 1977-1984.

Year	Effort (Trap Nights)	Red-back voles/ 100 Trap Nights	Masked shrews/ 100 Trap Nights	Other/ 100 TN	Total/ 100 TN
1977	2880	4.9	5.6	1.2	11.7
1978	4320	12.6	1.8	0.4	14.8
1979	1440	10.8	4.0	1.9	16.8
1980	1080	7.2	1.3	0.6	9.2
1981	1800	12.3	3.9	0.3	16.5
1982	540	4.2	4.1	0.4	8.7
1983	2160	1.7	3.6	0.0	5.3
1984	720	15.5	1.5	0.3	17.4

11. Fisheries Resources

The fisheries projects on the refuge during 1984 have already been summarized under Research and Investigations. The majority of studies emphasized salmon because they are of commercial and sport fishing importance. These studies, primarily conducted by ADF&G, are confined to the Kenai River and Kasilof-Tustumena Lake drainages because this is where the largest salmon runs occur. Prior to 1983, very little work had been conducted and thus little fisheries information was available on salmon runs in other drainages (Chickaloon River, Swanson River, Moose River, and Fox River) or on resident fish populations throughout the thousands of fresh water lakes on the refuge.

Major efforts to obtain fisheries information from other areas of the refuge were continued (Remote and Roadside Lake Study) or initiated (Investigation of Fisheries Resources in the Chickaloon River Basin, Kenai National Wildlife Refuge) during 1984 by the Kenai Fishery

Resources Station. These studies are providing baseline information that will be needed to develop a meaningful refuge fishery management plan. As development occurs on the Kenai Peninsula, especially on off-refuge lands adjacent to the Kenai River, the importance of the Kenai NWR as spawning and rearing habitat for salmon and for supporting numerous resident fish populations will become more apparent and hopefully appreciated. These studies become important as the potential for altering natural stocks of fish on the refuge increases due to commercial and sport fishing pressures and stocking and enhancement programs.

Salmon spawning and rearing habitat on the lower Chickaloon River. (8/84, RKJ)

High eroding bank serving as a source of spawning gravel for the Chickaloon River. (8/84, RKJ)

12. Wildlife Propagation

A draft proposal was prepared to reintroduce caribou into the central and southern regions of the refuge. Historical reports and old caribou antlers indicate caribou once occupied the area. The last natural herd of caribou in the region was seen in 1912. In cooperation with the Alaska Department of Fish and Game, it is proposed that 40-60 caribou from the Nelchina Basin be captured and released on the refuge. The region between Skilak and Tustumena Lakes is first priority for the release and if sufficient caribou are available, a second release will occur in the Caribou Hills. All released caribou will be ear-tagged and fitted with visual, numbered collars. Twenty caribou will be fitted with radio collars and intensively monitored for up to at least 2 years following the release. The proposed reintroduction is scheduled for mid-April 1985.

16. Banding and Marking

The numbers of birds and mammals banded or eartagged as part of refuge funded investigations in 1984 are shown in Table 22. All banded and ear-tagged specimens have been reported to the Bird Banding Laboratory (migratory birds) and the Alaska Department of Fish and Game.

Table 22. Numbers of birds and mammals banded or eartagged on the Kenai National Wildlife Refuge, Alaska, 1984.

Species	Number
Snowshoe hares	184
Wolves	22
Lynx	7
Trumpeter swans	13
Bald eagles	4
Brown Bears	3
TOTAL	233

18. Injured Wildlife

In an attempt to address the increasing number of injured wildlife turned into or reported to the refuge, the refuge is working in cooperation with a local veterinarian, Dr. Bart Richards, who decides through physical examination, x-ray, and various tests whether an injured creature can be released. Those requiring intensive care or rehabilitation are cared for by seasonal biological technician Mary Portner. Many of the injured individuals have been shot or caught in steel traps. Of the 27 individuals examined in 1984 (Table 23), 13 were successfully released into the wild. Five non-releasable animals were sent to research, educational, or zoo facilities, and 9 were euthanized or died of traumatic injury.

An adult female goshawk, whose wing had been amputated, was rehabilitated, and is being used for educational purposes for visiting school groups.

Table 23. Number of animals and species rehabilitated in 1984.

Species	Number
Bald eagle	4
Great-horned owl	3
Northern goshawk	1
Sharp shinned hawk	1
Tundra swan	1
Canada goose	1
Mallard	1
Common snipe	2
Glaucous winged gull	1
Common raven	5
Northern shrike	1
Varied thrush	1
Bohemian waxwing	1
White-winged crossbill	2
Red squirrel	2
TOTAL 15 Species	27 individuals

Biological Technician Mary Portner holds rehabilitated bald eagle prior to its release. Many injured wildlife are reported to or brought into the refuge office each year. (12/84, MBK)

H. PUBLIC USE

1. General

The refuge's public use program continued to emphasize maintaining the quality and appearance of existing facilities and programs rather than initiating new ones. The visitor center, which became a community focal point for wildlife information/education activities continued that role in 1984. The year-round weekend wildlife films brought in over 5,000 persons. This slight drop from last year can be attributed to lack of advertising directly related to lack of personnel. As a result, attendance waned until the addition in September of Park Technician Candace Ward revived interest in the film series. The growing popularity of the visitor center required an employee to staff it. The Park Technician not only relieved beleaguered secretarial staff of duties such as issuing permits, answering questions, and selling books but added vigor and direction to the interpretive/environmental education effort.

All campgrounds and trails were designated by routed redwood signs in 1983. In 1984, we repaired these signs and tried to stay one step ahead of the vandals. Since signs suffer from indiscriminate shooting during October-May and with insufficient personnel to repair them or catch the perpetrators we have adopted a policy of simply removing non-essential signs after the tourist season, i.e., late September. The Forest Service covers their signs but our procedure has the same effect while enabling us to bring signs inside for maintenance. Since many locals use the refuge this time of year the lack of signs is not critical. During the first year of this policy, we received a commendation from the R.O. attesting that refuge signs never looked better. But maintenance is only half the answer; the lack of a supplier for routed signs for Alaska is a problem. Since we have the equipment, we're prepared to route our own signs conforming to FWS specifications. The only alternative is to do without.

Better use of personnel also improved the look of the refuge this year. Laborers were assigned to the busiest areas from mid-May through September with each responsible for their maintenance needs. Seasonal park technicians provided guidance in keeping these areas shipshape. Specialized maintenance functions such as garbage pick-up and pumping of outhouses continued on a contractual basis.

Refuge visitation continues to grow annually with estimates topping the 300,000 mark in 1984. The Kenai Peninsula, dubbed "Alaska's Growth Peninsula," recorded a population growth of 50% from 1980-84. It's also called "Anchorage's playground" since its proximity to Alaska's largest city brings many residents here throughout the year for fishing, sightseeing, or hunting. And when they come to the Kenai Peninsula, they come to the Kenai National Wildlife Refuge. With high visitation and multiple public use facilities, including avisitor center, contact station, campgrounds, trails, and canoe routes, Kenai shares the problems of popular lower 48 refuges.

The Kenai Peninsula has grown 50% since 1980 and the pressures of more people and development are being felt by the refuge. (6/84, MFB)

Cement boat ramps replaced vintage (and dangerous!) WWII aircraft landing mats at busy campgrounds. All campgrounds received new bulletin boards as well. Winter recreation took on a renewed emphasis as old cross-country ski trails were re-designed to start at the visitor center. The new trails were groomed by local volunteers using a track setter from the Kenai Peninsula Community College. From early November, 1983, until the first week of March, over 4,000 skiers used the trails. Well-groomed and well-signed, the ski trails became the newest and most popular form of local winter recreation. Volunteers managed to maintain the trails all winter. An indication of the enthusiasm with which the trails were received was evident when two local men walked into the visitor center and signed up as ski trail volunteers -- on August 17!

Cement boat ramp, replacing old WWII aircraft landing mats, being maneuvered into place. (7/84, BRC)

Attendance at the refuge's visitor contact station was down slightly from 1983, due mainly to a relatively poor late salmon run which brought fewer people past the one-room log cabin. Despite the slow-down, the cabin still saw an average of 55 visitors from Memorial Day through Labor Day. Completely staffed by volunteers during its 7-day a week - 10 hours/day schedule, the contact station's second full year of operation proved as rewarding as last year.

2. Outdoor Classrooms - Students

Some 2,500 students participated in the refuge's environmental education program in 1984, an increase of 66% over last year. Some 60% of the students in grades 3-6 within a 50-mile radius of the visitor center are currently using the facility for EE. Teachers are required to attend one of our twice-monthly orientations, scheduled September through May, before bringing their class for a visit. Orientation sessions last for two hours and teachers participate in the same activities their students pursue during their visit.

A typical school visit lasts from 9:00 A.M. until 2:00 P.M. Students see an introductory film "Denali Wilderness" which, although set in Denali National Park, matches refuge exhibits dealing with concepts of adaptation, interdependence, communities, succession, etc. After the film, students search the exhibit area with clipboards and quizzes, to answer questions on the various exhibits.

Children use exhibits during a learning activity on a school field trip. Since 1983, over 7,000 students have visited the Refuge Visitor Center on field trips. (1/84, MFB)

There are three levels of quizzes for grades 3-4, 5-7, and 8 and above. After a lunch break at Headquarters Lake, students return to their clipboards, pencils, and trail leaflets, and set out on the "Keen Eye Trail" where they answer questions at various stops along the way. The addition of the trail and accompanying leaflet enables classes to spend a full day at the refuge, and in 1984 a good number of local teachers did.

The refuge sponsored a poster contest to celebrate "Alaska Wildlife Week" in mid-April. This year's theme, "Wildlife Needs Wetlands," and was well received by local teachers since 80% of Alaska is classified as wetlands. First place winners and teachers received an airplane ride over the refuge, a book of their choice from our bookstore, and a free Kenai T-shirt. Second place winners received books and shirts, and 3rd place T-shirts only.

3. Outdoor Classrooms - Teachers

Kenai continued to offer twice-monthly teacher orientations for most of 1984. Teachers were required to attend one of these two-hour sessions prior to bringing their class for a visit. Since many local elementary teachers attended an orientation in 1983, the number of teachers was down with an average of 10 at each session.

Class visits were up from the previous year with returning teachers supplemented by a crop of new teachers. Among these new teachers and group leaders were those from private schools, pre-schools, and scouts as well as classes from as far away as Palmer (200 miles), Homer (75 miles), and Anchorage (175 miles). During April and May, the visitor center averaged one class each day with the first classes arriving in February. Our aim is to promote the refuge program as a year-round opportunity rather than just a site for spring field trips. But school finances, traditional patterns of behavior, weather, etc. are factors.

On Saturday, May 19, ORP Mike Boylan, seasonal park technician Karen Farrar, and YCC group leader Candace Ward went to Alaska Pacific University in Anchorage for a workshop on "Project Wild" environmental education materials, sponsored by Alaska Department of Fish & Game. In October, Candace Ward, who had been hired as the refuge's park technician, volunteer Sara Krejcha, and Boylan conducted a Project Wild workshop during the Kenai Peninsula Borough's in-service. Despite competition from less demanding workshops, "how-to" courses, and more entertaining sessions, the 8-hour course filled to capacity with 30 teachers participating. This turnout was a testimony to: 1) the motivation and professionalism of local teachers, and, 2) the refuge's reputation for offering worthwhile teaching materials. We plan to host at least one "Project Wild" workshop each year based on this year's success.

Also in October, Park Technician Ward attended a 2-day workshop in Anchorage for the National Wildlife Federation's new "Class Project" materials in preparation for a spring workshop.

6. Interpretive Exhibits/Demonstrations

This year saw the arrival of a hoary marmot to our visitor center thereby completing the exhibits installed two years before. Other improvements included new video tapes on topics including wolves, waterfowl, duck stamps, and endangered species added to the visitor center's videoplayer through the technical expertise of RO Audio-visual Production Officer Bob Olendorff.

Our most popular exhibit, the "Sounds of the Kenai" with its recordings of loons, wolves, woodpeckers, and ravens, received such heavy use that the cheap earphones were broken within a year. In 1984, we replaced the earphones with durable telephone-quality receivers and the exhibit has been trouble-free since.

This year, the refuge received a portable slide exhibit and tape player, transferred from Yukon Delta NWR. We're working with Lake Clark and Kenai Fjords National Parks to create a cooperative slide/tape program which will be set-up in the Kenai Airport to accompany the joint photo exhibit installed last year.

7. Other Interpretive Programs

The refuge's most popular interpretive program continued to be the weekend wildlife films shown year round. While the films introduced many local people to the refuge when the showings began last year, by 1984 the weekend movies were a local institution and, despite a lapse in publicity, they still managed to attract over 5,000 visitors.

Regrettably, a shortage of seasonal employees required the refuge to forego the evening interpretive programs we had conducted the previous summer. While our summer seasonals and volunteers were able to sustain basic visitor information, maintenance, and field biology duties, none of those available had sufficient interpretive background to conduct programs. It is hoped we can re-institute this popular program next summer using volunteers from the Student Conservation Association with formal interpretive training.

8. Hunting

Hunting is one of the most popular pasttimes on the refuge. Hunters had a fairly good year in 1984, and greatly assisted in the management of wildlife populations on the refuge (Table 24). Due to increased human population growth in southcentral Alaska, hunting is becoming more highly regulated on the refuge. Nearly all wildlife populations are being harvested at the maximum acceptable rates, consequently for some wildlife species the social structure has been greatly altered. The best news is that hare hunting continues to be excellent.

Table 24. Harvest statistics for big game on the Kenai Peninsula, 1984 season.

Species	Unit 15A	Unit 15B	Unit 15C	Total Unit 15	Unit 7	Estimated Peninsula Total
Moose*	21 Cow 111 bull	53 bull 30 (Trophy)	149 bull bull	-- --	52 bull	625
Caribou				0	52	52
Dall's sheep	115 hunters reporting			8	9	17
Mountain Goat	63 by lottery permit - 49 male, 15 female 64 by registration - 44 male, 20 female					128
Brown Bear	--	3 Fall	2 Fall	5	2	7
Black Bear*	49	30	66	145	71	223
Wolf**				40	10	50

*All harvest reports not in.
**Only combined data available at this date.

Moose hunter check stations were operated during the 1984 moose season. Moose hunting over most of the refuge is for any bull. The season runs from September 1 to 20. In addition, 30 cow moose tags were issued for the 1969 burn area which is accessible from both Swanson River Road and Marathon Road. Hunting pressure was up due to more hunters and good weather. Harvest in 1983 was 818 moose. In 1984, harvest reported to date is just over 600 moose. The bull/cow ratio also dropped in 1984 which indicates that the lower hunter success was due to fewer bulls available for harvest. Currently, the bull/cow ratio is about 6 bulls/100 cows over much of the lowlands on the refuge, which is 3 times lower than ADF&G minimums and 5 times lower than refuge objectives being established in the soon to be finalized Kenai Comprehensive Plan. Correcting this situation will be a complicated process because of different FWS and ADF&G goals and local opposition to regulation. ADF&G and FWS biologists will begin working on a cooperative program to increase bull numbers once the Kenai Comprehensive Plan is finalized and we have established, written goals.

9. Fishing

Sport fishing is perhaps the most influential activity occurring on the Kenai Peninsula and the Kenai National Wildlife Refuge. All of the refuge's high use management situations and/or facilities are related to sportfishing, particularly anadromous sport fisheries. While fishing occurs year around at numerous locations, the most challenging management situations occurs during the relatively short peak salmon runs of the summer months.

A state-wide harvest report published during 1984 said Kenai Peninsula fresh water sport fisheries supported 375,090 man-days of effort. Including the Russian River and the Kenai River, Kenai Peninsula lands provided approximately 15% of the total Alaska fishing effort. Hidden Lake accounted for .3%, Swan Lake and Swanson River Canoe Route lakes and rivers saw .4%, and Russian River alone had .9%. Statistics indicate that 7.2% of all Kenai Peninsula fishing days take place on the refuge. Kenai Peninsula fishing effort accounts for almost 40% of the state total and involves many additional fish which spawn and rear on Kenai NWR.

Management of sport fishing methods and means, seasons, and bag limits is primarily the responsiblity of the Alaska Board of Fisheries with management advice from the Alaska Department of Fish and Game, other agencies, and the public. Kenai Peninsula sport fishing regulations have become more conservative in recent years. Primarily because of increased effort, rainbow trout seasons have been reduced, limits reduced, and methods of harvest curtailed. In seven years, the rainbow season in rivers has been reduced from a 12 to 4.5 months. The majority of proposals accepted by the fisheries board for increased protection of rainbow trout and other sport fish were initiated by private citizens and sport fishing guides. In general, the refuge has supported this trend in sport fishing regulations. While there is no proof that rainbow stocks are dwindling, increased sport fishing has generated a conservative attitude. Several refuge locations, including the Russian River, Upper Kenai River, Skilak Lake, and portions of the lower Kenai River experienced more protective restrictions in 1984.

Fishing for sockeye and other salmon was excellent in the upper Kenai River and Russian River during 1984. Harvest and escapement of sockeye salmon runs were well above 1983, and well above average for both the first and second runs (Tables 25 and 26).

This Russian River salmon fisherman gets much needed advice from a future fisherman, "Keep your pole bent, Dad. Hey! whose that guy taking our picture?" (7/84, RKJ)

Table 25. Estimated sockeye salmon harvest, effort and success rates on Russian River, 1963-1984.

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
1963-84 Mean	11,005	12,153	23,158	29,6410	0.174	

* 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.

Table 26. Differences between weekday and weekend day fishing pressure and rates of success at Russian River, 1964-1984.

	Mean Angler Counts		Catch/Hour		Mean Hours Fished	
Year	Week-days	Weekend Days	Week-days	Weekend Days	Week-days	Weekend Days
1964	29.6	70.6	0.444	0.209	3.3	3.9
1965	31.7	78.1	0.305	0.223	4.5	5.4
1966	53.2	143.1	0.297	0.183	4.8	5.5
1967	68.9	110.5	0.171	0.100	5.3	5.4
1968	71.5	124.9	0.153	0.107	5.3	5.8
1969	64.5	111.7	0.110	0.074	4.9	5.1
1970	83.5	127.8	0.140	0.100	4.8	4.7
1971	87.9	157.2	0.194	0.189	4.8	5.3
1972	73.3	138.5	0.203	0.187	4.0	4.4
1973	147.1	195.0	0.113	0.088	4.8	5.5
1974	123.8	144.4	0.164	0.085	4.7	5.7
1975	65.0	149.6	0.145	0.136	4.5	5.1
1976	72.5	134.4	0.165	0.161	3.5	4.5
1977	201.7	438.6	0.172	0.164	3.9	4.3
1978	264.1	425.7	0.205	0.191	3.9	4.2
1979	190.6	276.8	0.158	0.117	3.8	3.9
1980	299.1	317.8	0.270	0.210	4.2	4.7
1981	195.6	238.5	0.167	0.141	4.1	4.1
1982	256.0	423.4	0.210	0.144	4.3	4.5
1983	205.1	307.6	0.208	0.151	4.6	4.6
1984	217.1	342.3	0.261	0.211	4.8	4.7
1964-1984 Mean	129.2	205.7	0.200	0.151	4.4	4.8

Peak fishing at Russian River remained extremely dense with boat fishermen speeding downstream to find less crowded places to fish. Also, bank fishermen are using the north side of the Kenai River below the Russian-Kenai confluence more than ever and with relatively good success.

Boat fishing at the Kenai River below Skilak Lake has continued to grow in popularity and extends well into November for late season silvers, rainbows, and Dolly Varden. Including king salmon fishing, an estimated 41,442 persons used this stretch of the Kenai River for sport fishing in 1984 with many camping along the shoreline (Table 27).

Table 27. Kenai Peninsula Freshwater Sport Fisheries, 1983.

	Days fished	Est. % occurring on KNWR
Kenai River - (Soldotna Bridge to Moose River)	52,206	7%
Kenai River - (Moose River to Skilak Outlet)	41,442	15%
Kenai River - (Skilak Inlet to Kenai Lake)	26,453	70%
Russian River	35,018	70%
Kasilof River	16,675	5%
Swanson River	2,124	90%
Other Rivers	9,106	20%
Hidden Lake	6,671	100%
Canoe Lake System	7,014	100%
Other Lakes	16,443	50%
FRESHWATER TOTAL	375,090	

The above statistics represent survey data for 1983, and were published in 1984. Although there was an overall 1-2% increase in most fisheries, the poor 1983 run at Russian River made the 1983 total less than 1982.

Spring fishing for rainbow trout remains closed in the Kenai River above and below Skilak Lake due to intensive sport fishing which was found to be impacting spawning rainbows.

Lake fishing on the refuge remains high quality and relatively low density. Numerous lakes are available for both open water and ice fishing. Sport fishing methods and means, seasons, and bag limits are more liberal for lake fishing due to relatively slight, more dispersed fishing effort.

Skilak Lake, a glacial lake, experienced reduced glacial melt runoff during 1984 and visibility was the greatest on record. Several persons were observed trolling for lake trout in this generally unfishable lake. Lake water temperatures also rose significantly during 1984 as a result of reduced glacial runoff. Because the runoff from Skilak was clearer, the Kenai River downstream from the Skilak outlet to the Killey River confluence remained clear. While this clarity attractive to fishermen and boaters, the water was so clear that trout were more easily spooked by shadows and passing boats.

Fishing in the upper Kenai River continued its upward trend despite spring closures. The Alaska Department of Fish and Game (in response to increased harvest in this area) continued to protect spawning stocks of rainbows via closures. The Kenai River, from the Moose River confluence to Kenai (excluding Skilak Lake), was closed from April 29 to June 14.

Year round fishing activity continues to be an important activity at several locations. Ice fishing at roadside lakes along the Swanson River Road, Swan Lake Road, Sterling Highway, and Skilak Lake Road provides the most outstanding opportunities in Southcentral Alaska. Winter ice fishing activity is general low density day-use by local fishermen.

10. Trapping

Trapping continues to be a popular winter pasttime on the refuge. Last year, 114 permits were issued (Tables 28 and 29). As trapping pressure has increased since the designated trapline system was abandoned in the mid-1960's, more and more problems have resulted from both a resource and public use perspective. The furbearer management plan will hopefully be implemented before next trapping season. This year represents the second year we have delayed implementing a furbearer management plan pending completion of the Kenai Comprehensive Plan. Last season the number of problems between trappers and other recreationists increased. As the Peninsula continues to grow, the level of conflicts will rise as will the potential for resource degradation.

Table 28. Total reported land furbearer harvest and average per permit holder on the Kenai National Wildlife Refuge (Moose Range), 1960-1984.

		Land furbearer reported harvest									
		Lynx		Coyote		Wolverine		Weasel		Wolf	
Season	Total permits	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	--	---
1061-62	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

*Includes 9 lynx, radiocollared and released for study.
**Includes 1 lynx, radiocollared and released for study.

Table 29. Total reported aquatic furbearer harvest and average per permit holder on the Kenai National Wildlife Refuge (Moose Range), 1960-84.

		Aquatic furbearer reported harvest							
		Beaver		Otter		Muskrat		Mink	
Season	Total permits	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

11. Wildlife Observation

Kenai has a variety of landscapes and wildlife/wildland observation opportunities throughout the refuge. Scenic driving occurs in several areas and traffic volume is increasing on most roads. Thousands of wildlife/wildlands observations occur along refuge 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 visitation. The most recent (1983) annual traffic volume statistics for refuge roads are indicated in Table 30.

Table 30. Annual Traffic Volumes and Daily Averages, 1982

Annual Traffic Volumes (1982)	Average Daily Traffic	Annual
Sterling Highway (Approx. Watson Lk)	1,900	693,500
Sterling Highway (2 Mi. west of Russian River)	1,900	693,500
Skilak Rd-Sterling H.-L. Skilak Cpg.	130	44,800
L. Skilak-Upper Skilak	105	37,500
U. Skilak-Hidden Lk Road	105	37,500
Hidden Lk Rd-Junc. /Sterling H.	105	37,500
Hidden Lake Road	75	27,375
Lower Skilak Campground Road	60	21,900
Upper Skilak Campground Road	60	21,900
Swanson River (Refuge Boundary)	185	64,875
Ski Hill Road	50	13,775
Funny River Road	450	93,000
Tustumena Campground Road	55	23,725

Note: The above includes vehicles traveling both directions.

During 1984, several programs were initiated or continued intended to enhance wildlife viewing opportunities and appreciation of these resources. The Skilak Lake Special Management Area (SMA) was identified in the Kenai NWR Comprehensive Conservation Plan as a "wildlife viewing area" and the cornerstone of future opportunities for non-consumptive recreation. It is the refuge goal to maintain wildlife habitat so that populations are not depleted, while at the same time providing interpretive exhibits, facilities, and trails to enhance viewing opportunities.

A designated viewing area on the refuge has been discussed for over 20 years. Public demands to see wildlife on Kenai have become so frequent they cannot be ignored. The proposed Skilak Loop Special Management Area will provide viewing opportunities, wildlife information, and interpretation of management techniques, while prohibiting hunting and

trapping. This designated area should prevent future conflicts such as occurred in May. A young black bear was walking near the roadside. Several vehicles pulled off and cameras clicked as adults and children got a close look at the bear. That is, until three hunters happened by. Within their legal, if not ethical, rights, the hunters chased the bear a short distance into the woods where it was killed. We'll never know if the bear learned anything from this experience. The people watching the bear certainly learned that a refuge in not necessarily what it seems. And the refuge? We've learned, if we didn't already know, that we can provide hunting and viewing opportunities but not in the same place at the same time.

May 5, 1984, 1:15 P.M.
A young black bear wanders out of the woods on the Kenai National Wildlife Refuge as cameras click and cars stop. . . (RKJ)

May 5, 1984, 1:20 P.M. . . .
Until a truck load of hunters ends any viewing opportunities this bear might have provided. . .
(RKJ)

At interagency and public meetings the Skilak area's variety of viewing opportunities was emphasized. In addition to roadside opportunities, Skilak Lake SMA offers the most accessible backcountry settings, numerous hiking trails less than 3 miles in length, dozens of miles of lake shoreline accessible by boat, and excellent opportunities for short trail development outside of designated wilderness. It's 42,000 acres of unsurpassed scenery, mountains, lakes, and potential for wildlife viewing (with appropriate restrictions) could make the Skilak Lake SMA a true refuge within this "refuge".

12. Other Wildlife-Oriented Recreation

Excellent snowfall during early 1984 and improved maintenance made the headquarters cross-country ski trails very popular from November 1983 to March 1984. Volunteers from the local community college continued to set cross-country ski tracks after each fresh snowfall during the winter. The visitor center provided an excellent staging area for skiers and most skiers combined a ski trip with a walk through the visitor center. Many skiers reported seeing wildlife along the various trails. The local high school began holding a cross-country ski class daily with 15 students using the trails daily from January-March.

More than 4,000 x-c skiers used the re-designed trails in 1984, including these members of a local high school class. (1/84, MFB)

The Kenai Peninsula Audubon Society's second annual Christmas bird count was a success, despite harsh weather. Participants counted 14 species and over 500 individual birds.

Consistent with southcentral Alaska recreation surveys and past trends, boating and water-based activities become more popular annually. Floating the upper Kenai River has become so popular that on any given weekend dozens of floaters can be seen on river stretches paralleling the Sterling Highway.

Refuge portions of the lower Kenai River continue to receive tremendous amounts of boating use (see fishing statistics). The State of Alaska established a Kenai River Special Management Area under the jurisdiction of Alaska Division of Parks. A Fish and Wildlife Service representative was named to the Kenai River Special Management Area Advisory Board to address refuge management and other issues. The refuge initiated an exchange with the City of Kenai that would bring the Kenai River Flats within the refuge in trade for the former "Moose Range" headquarters within the city's business district. If the trade is consummated, the foremost viewing area on the peninsula for caribou, snow geese, and other waterfowl, will gain needed protection.

Snow geese heavily use wetlands along the mouth of the Kenai River during spring migration. The refuge is currently trying to obtain these wetlands as part of a land trade with the City of Kenai.
(4/84, MFB)

The Swan Lake and Swanson River Canoe Routes continued to be well-signed and well-maintained for refuge canoeists. Volunteers, seasonal employees, and refuge staff patrolled the 150 miles of water trails and portages as often as personnel would allow during the 1984 season. Visitor use of the canoe trails was estimated at 15,300 visits based on self-registrations.

Efforts to reduce wildlife displacement in the canoe system continued to be a concern. For the third year in a row, eagles successfully nested on one of the most popular lakes. Despite an increase of aircraft landings on closed canoe lakes due to the ANILCA 1110(a) regulation problem, the canoe trails continued to be one of the refuge's best opportunities to view wildlife in a wilderness setting. As this area grows more popular, various techniques will be needed to prevent further wildlife disturbance.

13. Camping

Efforts to display refuge regulations and interpretive information in campgrounds were helped by installation of new bulletin boards maintained by seasonal staff.

Providing clean restrooms, safe drinking water, campsite pads, fire grates, garbage containers, public safety patrols, and information continued to be a priority. Several campgrounds, including Jim's Landing, Dolly Varden, Rainbow, Kelly-Petersen, and Upper Skilak, received new entrance road gravel and basic upkeep maintenance. It's apparent that necessary improvement of existing facilities will require funds substantially above and beyond annual operation funds.

Campground problems are related to peak weekend crowding, aggravated by outdated or poorly designed facilities. A committment was made at the end of the year to solicit bids for an $80,000 Architecture and Engineering Plan for the 42,000 acre Skilak Lake SMA. If this is to remain the refuge's foremost public use area it will be a worthwhile investment.

During peak salmon runs, the Russian River campground/access area continued to require inordinate personnel demands as two park technicians, several volunteers, one refuge law enforcement officer, one special agent, and, an occasional State Trooper were needed to maintain order at various times.

Entrance road counters recorded 11,500 vehicles entering the Russian River facility with an average of 2.8 persons per vehicle, or 32,200 individuals. Many of these came to the area not to fish, but to sightsee or accompany fishermen. Recreational use fees collected were $12,590, as compared to $7,319 during 1983, and $7,884 during 1982. The increase in fees collected reflects a long and continuous salmon season, increased fee compliance by visitors, and an increased efficiency in fee collection. An unsuccessful attempt to convert the parking lot to a consession contract is still being pursued in the interest of more efficient use of personnel.

15. Off-Road Vehicles

January and February of 1984 were excellent for snowmobilers, if not for those who must tolerate them. Late 1984 was a significant contrast with the previous winter with little snowfall. The '84-'85 snowmobile season had not yet been opened by the refuge manager by the year's end.

Areas of particularly high use continued to be the alpine area within the Caribou Hills and certain seismic lines and waterways such as the Moose River. Considerable illegal snowmobile use occurs wherever several residences adjoin the refuge. As private residences are developed within and adjacent to Kenai as a result of conveyances and subdivision the problem of illegal ORV use will accelerate.

Three-wheeled ATV's are illegal everywhere on the refuge but continue to grow in popularity on the Kenai Peninsula. In light snow 3-wheeler tracks can be seen prominently. Citations issued for unauthorized 3-wheeler use on the refuge more than doubled this year.

At issue concerning snowmobiles on the refuge is their "traditional" use. "Traditional" could mean for trapping or for ice fishing perhaps but does sightseeing constitute "traditional" use? What will pass as "traditional" will certainly affect the future of snowmobiling at alpine locations as the Caribou Hills. Are hundreds of snowmobiles racing through wilderness participating in "traditional" activities? Does even a "traditional" activity become "non-traditional" as numbers of participants increase? These and other questions must be addressed if snowmobile use is to be held in check.

17. Law Enforcement

Kenai's four refuge law enforcement officers increased patrol operations 200 to 300 hours over the 4,000 hours logged during 1983 in vehicles, boats, foot patrol, and snowmobiles. Special Agent Wally Soroka and other FWS agents contributed significantly to the refuge LE efforts even though Soroka's administrative duties allowed him to participate less than in previous years. While refuge patrols increased, cases decreased in 1984. The decrease in the number of citations can be attributed to fewer cases by S.A. Soroka, lack of enforceable access regulations, and issuing more parking warnings than in previous years (Table 31).

Park Technician Bill Eickhoff takes information for a parking violation at Russian River Access Area.
(6/84, KPF)

Table 31. Violations on the Kenai National Wildlife Refuge for years 1978 through 1984.

Violation	'78	'79	'80	'81	'82	'83	'84
Snagging of fish	--	--	--	27	24	26	23
Fishing in closed water	--	--	--	13	4	13	4
Overlimit of fish	--	--	--	3	3	6	3
Fishing without a license	6	3	6	12	4	1	1
Other fishing violations	--	--	--	--	--	7	4
Snowmobiling violation	1	1	0	0	4	6	2
Motor boat in prohibited area	1	1	0	0	0	0	0
Unauthorized use of motor vehicle	16	4	11	7	10	9	20
Parking in No Parking Zone	0	21	15	19	13	2	12
Dropping objects from airplane	0	1	0	0	0	0	0
Lndg aircraft in prohibited area	0	4	4	1	4	6	0
Shooting fireworks/selling	1	1	0	0	1	4	2
Violation of State game reg.	4	1	1	3	0	1	1
Migratory Bird hunting violations	--	--	--	--	--	10	2
Littering	1	0	0	5	0	3	2
Illegal camp/boats/cabin	3	0	9	3	1	0	0
Unauthorized advertising	0	0	1	0	0	0	0
Illegal wood cut/cut green trees	0	0	3	3	4	5	2
Speeding	0	0	0	1	0	5	3
Reckless operation of machine	0	0	0	1	0	0	0
Unattended fire	0	0	0	1	0	0	0
Interference with employee	0	0	0	1	0	0	0
Destruction of Gov't property	0	0	0	0	1	0	0
Failure to comply with refuge SUP	0	0	0	0	1	2	2
Violation of Coast Guard Reg.	--	--	--	--	--	5	0
Totals	33	37	50	100	74	111	83

Meanwhile, law enforcement patrols continued to be conducted on Skilak and Tustumena Lakes as well as various portions of the canoe system. The Kenai River received regular patrols mainly from State Parks personnel as well as State Fish and Wildlife Protection Officers. Actual hours in the field are few by refuge officers to deal with increasing law enforcement and public safety needs.

Three new Chevrolet S-10 vehicles were received in late 1984 and one was equipped with a low profile light bar, public address system, and a siren. Equipping the vehicle with professional equipment increased the visibility of the primary refuge patrol vehicle and significantly enhanced the officers' safety during patrol operations.

Hunter check stations were operated for the fifth year on Swanson River Road (September 1-10, 15, and 16); and on Mystery Creek Road (September 1-5). Marathon Road (September 1-3) also had a check station for the second year. Refuge seasonal employees, volunteers, and permanent staff ran the check stations which were essential as hunter effort on Swanson River Road increased substantially. For example, over 80 vehicles were counted the opening morning of moose season at Swanson River Canoe Landing. During 12 days at Swanson River check station, personnel checked approximately 1,400 hunting parties and 2,400 hunters. Fifty four bull moose, 10 cow moose, and three black bear were taken. Mystery Creek Check Station counted 428 parties and 12 moose during its five days of operation. Marathon Check Station recorded 11 bulls and two cows in three days. One hundred eighty-two parties were counted.

Refuge personnel contacting these hunting parties helps decrease violations, deter serious violations and poaching, and aids in apprehension of violators.

Refuge volunteers and seasonal employees set up sheep hunter observation camps at Twin and Green Lakes accompanied by Alaska Fish and Wildlife Protection officers. Only one sheep was reported taken at Green Lake, and none were taken at Twin Lakes during the opening weekend.

18. Cooperating Associations

The refuge's Alaska Natural History Association (ANHA) sales outlets continued a healthy growth pattern increasing sales from $9,000 in FY 1983 to $11,500 in FY 1984 (an increase of 22% over last year's sales). This occurred despite decreased volunteer and seasonal employees for Visitor Center staffing. The strain on an overburdened clerical staff to handle sales and visitor questions enabled a new park technician vacancy to be filled in August. Candace Ward, a former park ranger/naturalist with state and national parks, was selected for this position, which included operating the visitor information desk, handling ANHA sales, coordinating the daily environmental education program, and managing the community volunteer program.

Visitation increased from 15,000 (1983) to 16,500 (1984) at the Visitor Center and remained at a constant 6,000 at the Sterling Highway Visitor Contact Station. The stable visitation at the Visitor Contact Station resulted from a poor July red salmon run at Russian River. The success of the Visitor Contact Station operation was due to the dedicated efforts of several 40 hour/week volunteers including Laurie Fenner, John Wilber, and Sara Krejcha.

The refuge carries some 30 sales items with the new 6-color T-shirt the most popular. Other new items include: The Alaska Almanac, Guide to Wildife Viewing in Alaska, Alaska Wild Berry Guide and Cookbook, Birds of North America (National Geographic), and The Wolf by Mech.

Visitors purchase natural history books from Park Tech Patty Mueller. Book sales are sponsored through the Alaska Natural History Association. Proceeds from sales help fund refuge education programs. (5/84, MFB)

The Visitor Center sales outlet was enhanced by a new T-shirt display and a handcrafted wooden notecard rack. The Visitor Contact Station initiated an outdoor, after-hours brochure and information rack.

Association aid to the area included a $500 honorarium to volunteer Sara Krejcha for outstanding work done as group leader for the Youth Conservation Corps. Monetary assistance from ANHA also enabled the refuge to obtain materials for educational workshops and volunteer recognition.

19. Concessions and Special Use Permits

An unsuccessful attempt was made to free our seasonal park technicians and volunteers from being parking lot attendants by converting the Russian River parking area to a concession contract. Converting the parking area (Recreation Fee Account Area) to a concession contract

would: 1) allow FWS employees to do more meaningful work than be parking lot attendants; 2) provide the government with a better return on its investment by gaining a percentage of more fees since they would be collected more efficiently; and 3) provide the public more in the way of interpretive services, law enforcement, health and safety, etc.

As 1984 closed, we were still sampling contracts from other regions in order to assist CGS in putting together what will hopefully be our first concession contract on the Kenai.

Request for new outfitter/guide special use permits again surpassed the previous year's request. Several new permits were written for float fishing and sightseeing on refuge portions of the Kasilof River. The dramatic increase in requests for refuge outfitter guide SUP has led to a freeze on new SUP's for certain locations and a conservative policy on several other areas. No new permits were issued after late spring for the upper Kenai River and Tustumena Lake. Kenai Wilderness SUP applications are carefully screened to insure that outfitter/guide SUP's do not exceed projected public demand.

Special Use Permit holders for the upper Kenai River were required to use non-motorized watercraft for the first time in 1984. The program was well accepted and refuge visitors reported excellent catches and an outstanding fishing experience. New SUP's for the Kasilof River were also being required to use non-motorized drift fishing boats.

Two special event SUP's were awarded during 1984. The Peninsula Sled Dog Racing Association conducted several races and training events, as well as the State Championship Sled Dog Race. Through the intervention of Senator Stevens, a permit was again issued for the 120-mile foot race, Alaska Mountain Wilderness Classic. As in previous years, safety concerns developed before, during, and after the race and some conflicts with wildlife occurred. The issue of commercial contests in wilderness has yet to be resolved through formal policy.

Participant in the Hope to Homer race uses a pack raft to cross several rivers and lakes during the 110 mile race. (8/84, KPF)

Three fly-in commercial tent camps were phased out during 1984 and an additional camp became available. Phasing out of tent camps at Trapper Joe and Tangerra Lakes resulted when Alaska North Flying Service was sold. The camps were reevaluated according to the 1980 Tent Camp Policy and SUP's discontinued. A third tent camp on Neckshorta Lake was discontinued when the SUP holder failed to renew. A fourth camp on Sport Fish Lake has been voluntarily relinquished by Alaska Bush Carriers and will be assigned or discontinued according to the Tent Camp Policy.

During 1984, seven new outfitter/guide SUP's were issued, and 29 renewals for a total of 36 outfitter/guide SUP's. Other SUP's issued during 1984 were: Five permits for 17 fly-in tent camps, 14 permits for guiding on the Kenai and Kasilof Rivers and other boating operations, one permit for the operation of the Russian River Ferry, 11 permits for big game guiding and/or outfitting, nine permits for Swan Lake/Swanson River Canoe Route guiding, and two permits for organized races or special events on refuge lands. (The number of permits for individual areas do not equal the total because some of the SUP's authorize several activities.)

Veteran Swan Lake/Swanson River Canoe Route outfitter/guide John Stephan was cited for failure to comply with his special use permit regarding group size. Stephan had repeatedly challenged the constitutionality of refuge SUP's. He was sentenced to 300 days in jail and a $500 fine, with all but $250 suspended provided no further violations occur.

I. EQUIPMENT AND MAINTENANCE

1. New Construction

The refuge installed 24 new public use information bulletin boards in campgrounds and other high public use areas throughout the refuge.

New bulletin boards have been installed at several campgrounds. (11/84, BRC)

New fire pits were installed at camp sites in Dolly Varden and Rainbow Lake campgrounds.

A new ventilation system and heat make-up unit for the refuge maintenance shop was installed to remove carbon dioxide.

A new iron pipe gate was installed at the Schooner Bend campsite and at the entrance of the Ski Hill Access Road leading to the telecommunications towers.

In June, components for our new storage building arrived. In September, the contractor began site clearing and preparation for a new 40' x 50' heated storage facility.

New Storage Building (12/84, BRC)

2. Rehabilitation

Fifty picnic tables were brought into the shop from campgrounds in the Swanson River area, repaired, painted, and then returned to the campgrounds.

Spring break-up produced hazardous erosion conditions to some of our roadways and campgrounds. May and June were used to make these areas safe. Erosion and flooding continue to eat away the road and a few camping spurs leading in Jim's Landing Campground.

May, June, and July were a challenge for our maintenance staff as they cleaned up litter in campgrounds and along the roadways; painted barrier posts and sign posts, installed signs and repairing shot-up signs.

Dolly Varden and Rainbow Lake campgrounds were improved by removing overgrowth, lengthening and levelling parking spaces, adding gravel, dirt, and landscaping, and removing old barrier posts.

Several large birch trees were removed from the storage building site and transplanted around the Headquarters/Visitor Center complex. (Hope they survive.)

Trees being transplanted. (9/84, BRC)

Two mobile homes, used for seasonal housing near Russian River, were cleaned, skirted, and stained. The bunkhouse near refuge headquarters was also cleaned.

Mobile Home at Schooner Bend provides housing for seasonal employees in the Russian River-Skilak Loop area. (12/84, RDK)

During the last week in September, all refuge campground, wayside, trail head, and other public use signs were taken down and removed from their standards. The undamaged signs were placed in indoor storage for replacement in early spring. The damaged signs are being repaired. Last year a great number of our signs were extensively damaged, stolen, or destroyed during the fall/winter period.

Attempts were made to drill a new well at the headquarters area in hope of achieving better quality water. The well was abandoned, casing removed, and the hole filled with concrete due to low quality water.

3. Major Maintenance

Tustumena Lake Campground boat ramp was revamped. The old aircraft landing mat was replaced with concrete plank, spaced 3" apart and tied together with 1/2" braided cable.

The refurbished Tustumena Lake Campground boat ramp completed in 12/84. (12/84, BRC)

Over $91,000 of gravel was spread over refuge roads, campgrounds, and waysides. Refuge staff and equipment put the finishing touches on the newly-hauled gravel.

"Old" road grader assisting with the gravel spreading on the roads, campgrounds, and waysides. (5/84, BRC)

Engineer Lake was improved by graveling the parking area and placing concrete parking bumpers to limit vehicles to the parking area, transplanting birch trees and alder to conceal and revegetate illegal access roads, and replacing a toilet destroyed by some trigger-happy person.

Vehicle and equipment maintenance have received a great deal of attention throughout the year. With the hiring of a full-time maintenance mechanic, Elvin O'Guinn, and our volunteer mechanic, Rey Gibson, our vehicle fleet and equipment are maintained in excellent operating condition.

Mechanic Elvin O'Guinn at work. (9/84, BRC)

Domestic water system and water reserve tank continues to demand a great deal of attention from our maintenance staff. The iron bacteria level is so high that water softners can't remove it which requires much time to maintain the system. The high iron content also discolors shower stalls, toilets, and drinking fountains. (Tastes terrible, too.)

Summer laborers were busy maintaining public use campgrounds, hiking trails, roadways, signs, and waysides. Increased visitors make greater demands on recreation facilities and the requirements for cleanliness, litter, vandalism, and preventive maintenance continue to be a major task for all staff.

The refuge road grader was busy maintaining public roadways, parking areas, campgrounds, and closing illegal access areas by plowing a ditch to discourage such practices by the public.

4. Equipment Utilization and Replacement

All property (equipment and tools) was inventoried. A list of over 75 items was developed to either be placed on survey or surplus to our needs.

Replacement equipment added this year consists of three new S-10 Chevrolet 4x4 extended cab pick-up trucks.

S-10 extended cab pick-ups. (8/84, BRC)

We added a new 930 Caterpillar front-end loader to our heavy equipment. With the large 2-1/2 yard 3 in 1 bucket, we will have greater capability to pick up and place large rocks for natural barriers, load dump trucks for maintaining many miles of refuge roads and parking areas, and aid in snow removal efforts..

930 Caterpillar Loader (8/84, BRC)

Our new loader (included in the bid) was equipped with the latest type tire chains. This type of chain (TRYGG) has a much better grip and is safer than regular tire chains in that they will not fly off while travelling and are of higher quality steel. They are excellent on ice. The cost per set is $646.00 "F.O.B. Idaho".

We replaced our tired old road grader with a new 130G Caterpillar Road Grader this year. The little beauty was a welcomed addition in updating our heavy equipment needs. It was immediately checked from front to rear and put to good use. With nearly 50 miles of refuge road and numerous campgrounds to maintain, it will receive continual use.

130G Road Grader (12/84, BRC)

5. Communication Systems:

Telecommunications capability on the Wang OIS was activated and we can now communicate with Dialcom, the Regional Office and other Wang systems.

No changes occurred during the year with our VHF radio system. We installed a base station Motorola Micom .5 single sideband HF radio during the year in the office.

6. Computer Systems:

During early 1984, we upgraded our Wang System 5 to a Wang Office Information System 115-3. This word processing system will enable us to expand with additional workstations as needed which was not possible with the Wang System 5. We currently operate two workstations, but will expand to five as funds permit. The Wang System 5 was transferred to Raptor Management Studies in Juneau, Alaska.

In January, 1984, the Regional Office loaned us an old Beehive terminal to enable telecommunications with the MV8000 in the Regional Office to enter financial information. The terminal was connected only to a modem and we were unable to obtain any of the reports generated by inputting this information without having it mailed from the Regional Office. Using commercial long distance to enter financial information keystroke by keystroke proved an expensive and troublesome method to input this data.

During December, 1984, a Data General Model 10 micro-computer was installed. No software except word processing was made available.

7. Energy Conservation

The major cause of our increased energy consumption in electricity and natural gas was the utilization of the new shop, bunkhouse, and the 3-bedroom family quarters. These facilities, even though energy efficient, are larger and have many new conveniences which were unavailable in the old facilities. Another cause of increased energy was the opening of the visitor center on weekends and occasional nights. Example: field quarters in Cooper Landing was also used this year which increased electricity consumption. As shown on the following table electricity and natural gas increased by 13% and 8.2% respectively:

Skilak Guard Station, located on Skilak Loop Road, provided onsige housing for two seasonals.(11/84, RKJ)

Table 32. Energy use comparisons.

Product	Unit of Measure	Consumption FY84	Consumption FY83	Comparison/FY83 %Inc.
Electricity	KWH	155,804	137,830	13
Natural Gas	100 Cu. Ft.	22,342	20,625	8.3
Vehicle Gas	Gallon	11,263	10,104	11.4
Aviation Gas	Gallon	7,624	5,088	49.8
Propane	Gallon	623	209	198
Diesel Fuel	Gallon	1,266	751	68.6

During the past year we have been negotiating with the City of Kenai for transfer of our old headquarters/residence/shop facility in Kenai. The transfer has not taken place and we continued to use the residences for our increased volunteer staff. The old headquarters was used during the summer by volunteers and a Special Studies team from the Regional Office. The National Park Service began utilizing the facilities late in the fall for office space.

Our consumption of gasoline increased by 11.4% due to expanded maintenance and biological programs.

Propane use increased by 198% because field quarters at both Cooper Landing and Skilak Loop Road and the Visitor Contact Station were being used this year. Diesel increased 68.6% over last year because of greatly expanded road maintenance and campground maintenance activities.

Aviation fuel usage increased by nearly 50% due to greatly expanded flight hours associated with expanded biological monitoring programs involving radio tracking.

J. OTHER ITEMS

2. Other Economic Uses

a. Oil and Gas

1) Beaver Creek Field - For the second consecutive year, no drilling operations were conducted.

Due to a deficiency in electrical power generation capacity, a 230 kw generator was installed behind a 330 hp diesel industrial unit. To accommodate the new generator, a 12X16 foot addition was constructed.

Oil Wells Nos. 4 and 5RD were produced on gas lift supplied through the compression of solution gas. Make-up lift gas was supplied by Well No. 6.

Gas Wells Nos. 1A, 3,6 and 7 were put on production to Alaska Pipeline Company on January 8, 1983, via facilities and pipelines installed in 1982. Well No. 2 has remained shut-in as a reservoir monitor well.

Cumulative production through October 31, 1984 was:

3,006,784 barrels of oil.
1,182,303 MCF of solution gas.
17,074,698 MCF of gas well gas.

Production for the period November 1, 1983 through October 31, 1984 was:

159,334 barrels of oil.
103,535 MCF of solution gas.
8,935,773 MCF of gas well gas.

Production for the month of October, 1984, was:

13,355 barrels of oil.
7,642 MCF of solution gas.
940,048 MCF of gas well gas.

The Beaver Creek Field (BCF) is the 4th largest gas field in Cook Inlet Basin. Reserves are estimated at 239 billion cubic feet of dry gas and one billion cubic feet of associated gas. Gas produced at Beaver Creek Field is transported by pipeline three miles to the Alaska Pipeline Company (APC) Royalty Pipeline from where it goes to Anchorage. Average gas production from BCF is 25,000 MCF/DA with 32,000 MCF/DA winter. BCF with current production equipment can produce up to 40,000 MCF/DA. The Alaska Pipeline Company (APC) through its distributor ENSTAR, serves more than 63,000 customers in the Anchorage Basin.

Only 120 cubic yards of gravel were mined from the authorized pit area for use of field operations. The fair market price received was $180.00.

2) Swanson River Oil Field (SRF) - On July 21, the Swanson River Field, oldest oilfield in the State, celebrated its 27th birthday and production of the 200 millionth barrel of oil that day. Since "Discovery Well," July 23, 1957, this field had produced 201,207,847 barrels of crude by year's end and earned more than $800 million. Discovered by Richfield Oil Company, forerunner of ARCO Alaska, the field produced 36,000 barrels a day at its peak in 1967. Currently, it's pumping 6,900 barrels daily and reinjecting 285,000 MCF gas a day to maintain formation producing pressures. The Swanson River Field is one of the most productive in the nation and so far nearly 45% of all the oil believed trapped underground has been recovered. The average field yields 25 to 30%.

To increase the recovery of this reservoir, a new gas injection project began in January in the field's southernmost fault block. With the new system, Chevron USA hopes to extend the field's life into the early

1990's. The Company will use gas injection wells to push more natural gas back into the 12 square mile field boosting the pressures to 5500 PSI and recover an additional 2.9 million barrels. The injected gas will ultimately be recovered during "blowdown" of the reservoir.

Nearly 4,500 gal/day of propane were produced for commercial sale. This production is a spinoff of the normal gas recovery and gas compressor operations.

No new wells were drilled during the year although remedial work was conducted on SCU 41A-9 and SRU 32-33.

In support of field operations, 1870 cubic yards of gravel were mined within the Swanson River Field. These sales totaled $2805.

Following 22 years as Area Foreman, C. Wayne Wilson retired April 20, as Manager of the Swanson River Oil Field. The excellent cooperation between Field operations and refuge responsibilities was due in large measure to Wayne and his staff. Not new to the field is Wayne's replacement, Bud Kloppenburg.

3) Alaska Pipeline Company (APC) - APC is the transmission arm for Enstar Natural Gas Company of Anchorage, which provides natural gas to 63,000 residential and industrial customers in Southcentral Alaska. Two parallel gas transmission lines transport an average 80-90,000 MCF/DA during summer. During cold weather early this year demand peaked at 212,000 MCF/DA.

A review of the original BLM right-of-way grant to APC confirmed our understanding of APC's responsibilities for facility operations within this 38.1 mile refuge corridor. Highlights include:

a. The 50 foot right-of-way between M.P. 26.5 and 64.6 is entirely within the Kenai NWR. Maintenance of that right-of-way including roads, bridges, and other facilities is the direct responsibility of APC for the lifetime of the pipeline.

b. The access road (Mystery Creek Road) originating at the Sterling Highway and connecting with the pipeline right-of-way at approximately M.P. 38.3 and M.P. 40.2 has reverted to the sole jurisdiction of the FWS. The maintenance of that facility rests with the KNWR.

c. Airstrips outside the right-of-way belong to FWS. Future use of these facilities by APC in support of maintenance, new construction or emergencies may be authorized.

d. An emergency cabin facility near Burnt Island, helicopter landing area, and cathodic protection rectifier is installed near the cabin. These facilities are authorized and maintained by APC.

e. The "Mystery Creek" access road will remain open to the public during moose hunting season and a reasonable period beyond for authorized public activities. During bad weather when damage to the bridges or siltation into fishery resources might occur the access road and right-of-way may be closed.

4) Kenai Pipe Line Company (KPL) - No change. Nothing to report.

5) Tesoro Alaska Pipeline Company - No change. The Point Possession Native Group has selected under ANCSA those lands in which this right-of-way exists.

6) ARCO Exploration Company (ARCO) - Seismic field operations were conducted between January 2 and March 21, by Norpac Exploration Services, Inc. for ARCO Alaska, Inc. This was a continuation of ARCO's exploration for oil and gas on subsurface lands conveyed to Cook Inlet Region, Inc. (CIRI). A total of 73 miles of seismic data was acquired during the season. Using Vibroseis and helicopter portable methods with surface and minihole explosives. Approximately 689 miles of seismic data have been acquired under the ARCO/CIRI exploration agreement since 1979.

The drilling of the Funny River No. 1 exploration well by ARCO began in November using Pool Arctic Alaska's Rig No. 7, a diesel/electric drill rig with 25,000 foot capacity. Finding no commercial resources by April, the well was plugged and abandoned at 18,009 feet, the deepest well on the Kenai Peninsula. Rehabilitation of the pad, and gravel source, and access road completed August 23.

The October, 1983 abandonment and reclamation of the ARCO/CIRI Wolf Lake Well No. 1 drill pad and access road was completed June 28.

October 15, ARCO began reopening a portion of the reclaimed Wolf Lake No. 1 well/access road and construction of a new drilling pad for Wolf Lake Well No. 2. The well was began November 10, and by the 19th had drilled past 5,000 feet. This was the third of three wells drilled under agreement with CIRI, the subsurface owner of oil, gas, and coal resources in that area. The first two wells, Wolf Lake No. 1 and Funny River Well No. 1 were both dry, plugged, and abandoned. Wolf Lake No. 2 was also plugged and abandoned February, 1985.

Wolf Lake Well No. 2. the third well of three under an ARCO/CIRI agreement to explore CIRI's oil, gas, and coal subsurface conveyance. All wells were plugged and abandoned for lack of a commercial find.
(11/84, RAR)

3. Items of Interest

As always, Kenai continue to attract more than its share of notables on VIP trips throughout the year. This year's guest list included: Assistant Secretary G. Ray Arnett (several times); BLM State Director Mike Penfold, BLM Director Robert Burford and his wife, ex-EPA head Ann Gorsuch Burford; FWS Deputy Director Gene Hester; and a CBS camera crew from Charles Kuralt's "Sunday Morning" show filming a segment on Alaska's 25th anniversary of statehood.

4. Credits

All refuge staff participated in the writing and photography of the narrative. It was typed in its entirety by Pat Fencl, with assistance from Leslie Blaylock and Anne Toppa.

K. FEEDBACK

Item:

Kenai's heavy visitation allows it to be compared to popular conservation units managed by other agencies in Alaska such as the Forest Service and the Park Service. But the comparison is not favorable. Denali National Park, Chugach National Forest, and Kenai NWR are the three most heavily visited land units in Alaska with visitors (allowing for different recording methods) between 300-400,000.

Since the three areas are similar in size, visitation, maintenance, and personnel requirements (law enforcement, visitor information, permits, etc.), it's interesting to compare budgets. Denali's operating and maintenance (O&M) budget of $4.3 million supported a staff of 138 people (23 PFT and 105 seasonals) and Chugach National Forest's O&M budget of $4.9 million maintained 144 employees (94 PFT-50 seasonals), Kenai's O&M budget of $1 million barely sustained 28 employees (15 PFT-13 seasonals). It is interesting to note that two agencies -- the National Park Service and the U.S. Forest Service -- independently look at similar areas and arrive at almost identical personnel (144 vs 138) and budget requirements ($4.9 vs $4.3 million). How can Kenai, with similar visitation, operations, and maintenance needs, and such drastically dissimilar budget/staffing, continue to do the job? Bluntly, we're providing minimum services and our facilities are substandard and getting worse. When the costs of doing business in Alaska are considered the budget disparity between these other units and Kenai is even more telling.

Since passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980, federal agencies have mobilized to bring inter-agency visitor centers on-line in major cities. Other agencies have effectively lobbied for funds to create "showplaces" at units with heavy visitation. In FY 84, Chugach NF received an $8 million visitor center. In FY 85, Denali NP received $6.25 million for road construction. The completion of Kenai's Comprehensive Conservation Plan calls for a 100% increase in funding and staffing. Whether that remains theoretical or becomes a reality, only time will tell. . .

Item

As of 1982, refuge regulations regarding access were stable and generally accepted by the public. Access restrictions generally precluded overharvest problems without closures. Public hearings during development of the Kenai Comprehensive Conservation Plan reiterated the historical wisdom of existing access regulations.

A problem developed when two illegal aircraft landing cases came to the attention of the U.S. Attorney's office prior to trial. The U.S. Attorney's office held, in a pre-trial ruling, that ANILCA Section

1110(a) was to be strictly interpreted and that Kenai's regulations for aircraft, snowmobiles, motor boats, and non-motorized surface transportation methods for traditional activities were no longer in effect and would not be enforced until the refuge manager held specific public hearings. Kenai's existing regulations, unrevised since 1980, according to the U.S. Attorney's interpretation of ANILCA, are held to be invalid, as far as snowmobiles and aircraft are concerned. The refuge maintains existing access regulations should have been enforced until new regulations were published and that the hearings held for the Kenai Comprehensive Conservation Plan could have satisfied the ANILCA 1110(a) requirement for public hearing and notice.

Despite numerous violations no cases have gone to Court since the U.S. Attorney's interpretation. Despite leaflets, snowmobile regulations, aircraft brochures, and the outdated regulations published in the Code of Federal Regulations, the public is aware of the enforcement "window" and many have taken advantage of aircraft accessible trapping and hunting opportunities. According to Washington, public safety or "enforcement convenience" are not justification for new regulations. Only "biological" resources may justify closures but not public safety, recreational, visual, archeological, and other wilderness resources. Over 50 illegal aircraft complaints were received during August and September and several big game animals hunted supported by previously illegal aircraft landings. Even if new regulations were to immediately take effect it will take at least two years to rectify this situation. The refuge's credibility with the public may be the greatest casualty. Although this problem prevails on all Alaska refuges, the complexity of Kenai's public use makes regulations critical to resource protection and public safety.

Item

Seasonal park technicians contribute significantly to the refuge law enforcement program and assist refuge and State of Alaska officers with emergency and law enforcement matters. Kenai's program would be enhanced by commissioning seasonals who have the necessary qualifications. Although seasonal employees receive a basic orientation to refuge regulations, Title 50 Code of Federal Regulations, and emergency notification, a law enforcement commission would allow them to accept additional responsibilities and receive further law enforcement training. A number of our seasonal employees have received formal law enforcement training from other agencies or at their own expense. Yet unlike NPS or Forest Service, FWS has no way to recognize this expertise. During the busy summer season when the situation is most critical, it is our GS-5 seasonals doing defacto law enforcement while GS-11/12 officers are stuck behind their desks.