Kenai National Wildlife Refuge
Soldotna, Alaska

Annual Narrative Report
Calendar Year 1982

Standing L to R: Hedrick, Blaylock, Johnston, Fencl, Bangs, Richey, Delaney, Kivi, and Heath.
Kneeling L to R: Chio, Tom Hester (1983 Volunteer), Bailey, and Boylan.
(Staff Photo)

1982 PERSONNEL

Permanent

1.	Robert L. Delaney	Refuge Manager	GS-13 PFT		
2.	Vernon D. Berns	Asst RM, Enforcement	GS-11 PFT	Trans	2/20/82
3.	Michael B. Hedrick	Principle Asst RM	GS-12 PFT	EOD	6/14/82
4.	Robert A. Richey	Asst RM Oil & Gas (Pilot)	GS-12 PFT		
5.	Linda K. Gintoli	Supv. Recreation Planner	GS-11 PFT	Resign	5/14/82
6.	Michael F. Boylan	Supv. Recreation Planner	GS-11 PFT	EOD	11/1/82
7.	Theodore N. Bailey	Fish & Wildlife Biologist	GS-11 PFT		
8.	Richard K. Johnston	Recreation Planner	GS-09 PFT		
9.	Eugene P. Heath, Jr.	Administrative Officer	GS-09 PFT		
10.	Edward E. Bangs	Wildlife Biologist	GS-09 PFT		
11.	Leslie G. Blaylock	Accounting Technician	GS-05 PFT		
12.	Richard D. Kivi	Equipment Operator	WG-10 PFT		
13.	Benjamin R. Chio	Facilities & Equip. Mechanic	WG-09 PFT	EOD	6/1/82
14.	Patricia A. Fencl	Clerk/Typist	GS-03 PPT		

Temporaries

				EOD	TERMINATED
1.	Robert M. Campbell	Laborer	WG-03	04/05/82	01/07/83
2.	Albert V "Bud" Marrs	Laborer	WG-03	04/05/82	10/29/82
3.	Heather M. Bardy	Clerk/Typist	GS-02	04/12/82	10/01/82
4.	Mary F. Portner	Biological Tech.	GS-05	05/03/82	10/01/82
5.	Walter J. Jakubas	Biological Tech.	GS-05	05/03/82	10/01/82
6.	William P. Eickhoff	Park Technician	GS-05	05/17/82	09/17/82
7.	Donna M. Bartman	Park Technician	GS-05	05/17/82	10/15/82
8.	Donna M. Kafka	Park Technician	GS-05	05/17/82	10/15/82
9.	Peter J. Stortz	YCC Supv Grp Ldr	GS-07	05/17/82	08/20/82
10.	Lori J. Landstrom	YCC Group Ldr	GS-05	05/17/82	09/03/82
11.	13 individuals	YCC Enrollees		06/14/82	08/06/82

Volunteers

		TYPES OF WORK	EOD	TERMINATED	HOURS
1.	William J. Theisen	Recreation Planning	05/17/82	07/31/82	398.5
2.	Amy B. Jacobs	Recreation-Canoe System	05/17/82	08/20/82	528
3.	Patrick C. Reed	Wilderness Planning	06/01/82	11/09/82	924
4.	Lisa C. Macchio	Recreation-Canoe System	05/19/82	09/01/82	546.5
5.	Suzann D. Bush	Assisting-Biology	03/08/82	08/17/82	339.5
6.	John A. Jackson	Janitorial	04/05/82	12/14/82	100
7.	Rocky J. Dills	Laborer	05/17/82	07/23/82	272
8.	Jeromy Chio	Laborer	07/15/82	07/23/82	40
9.	Myron D. Mathison	Laborer	02/23/82	03/25/82	177
10.	Gardner R. Benson	Natural Resource Asst	08/20/82	09/30/82	336
11.	David Westerman	Trail Clearing	11/07/82	12/03/82	40
12.	Gary Hendrickson	Janitorial	06/01/82	01/18/83	75

Review and Approvals

Robert L. Delaney 3/3/83

Submitted by Date

Regional Office Review Date

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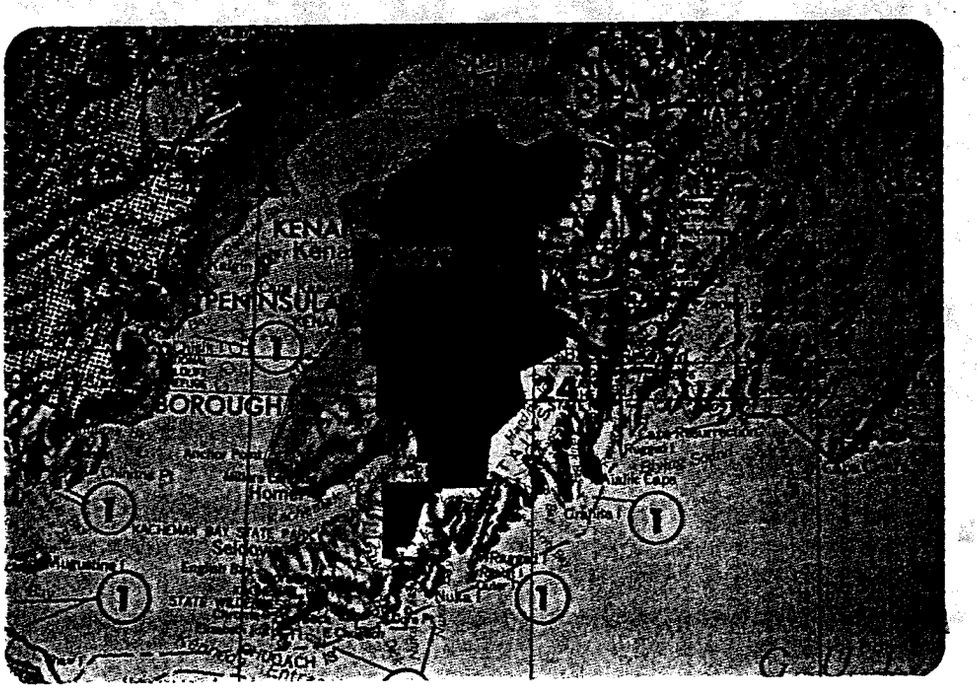


Configuration of the Kenai NWR after ANILCA. Dotted portions indicate designated wilderness. (Staff Photo)

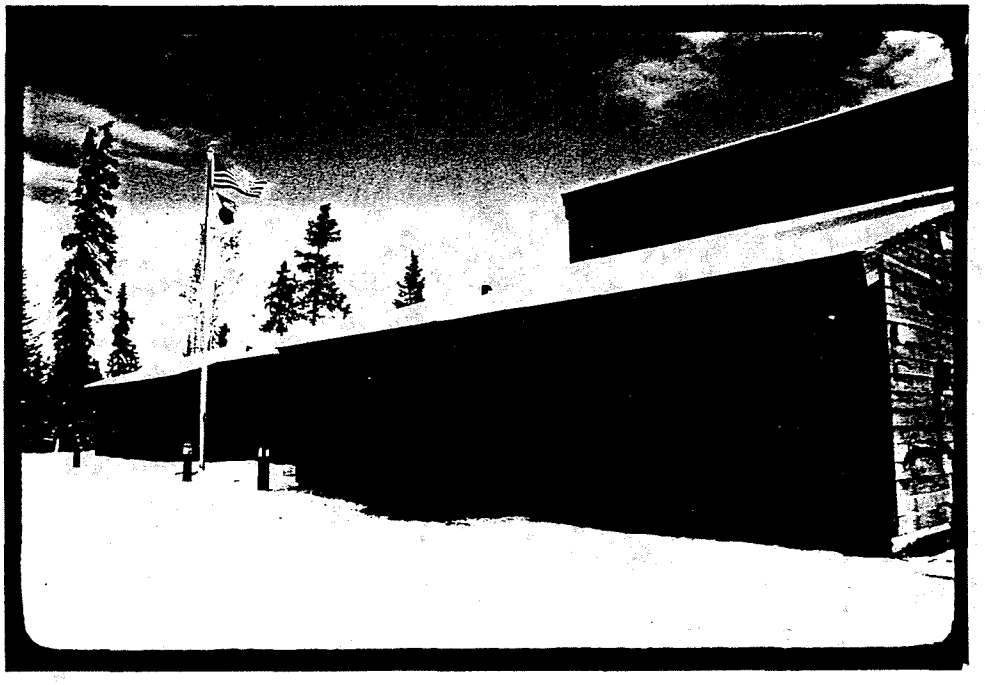
A. HIGHLIGHTS

The refuge staff, with Regional Office Planner, Norm Olson, completed the draft Kenai Comprehensive Conservation Plan this year. The refuge staff served as the planning team and worked nearly full time on the draft prototype from June through November, enabling the December date for Washington Office review to be met (Section D.1).

An extensive General Refuge leaflet was completed and several thousand copies printed for distribution to refuge visitors (Section H. 1).

The long awaited interpretive displays for our Visitor Center were completed, installed, and operational by year's end. The displays are the finest of their type in Alaska, and will greatly benefit the refuge program and public appreciation and understanding of the FWS role and mission at Kenai (Section H. 6).

The last of Kenai's BLHP facilities were completed at the Headquarters Site and included a new maintenance shop, storage building, fuel facilities, residence, and a bunkhouse for temporary employees (Section I. 1).



Our 3 year old Refuge Headquarters/Visitor Center provides excellent facilities for exhibits, interpretation and the expanding staff. (Staff Photo)

The year 1982 marked the end of the Young Adult Conservation Corps (YACC) program on the refuge, but we embarked on an extensive volunteer program which ranged from volunteers who conducted all janitorial duties

during the year to a Ph.D. candidate who prepared a draft Wilderness Policy Review document for application to Alaska refuges. We utilized a total of twelve volunteers in various capacities throughout the year (Section E. 4).

ARCO Oil Company, under contract to the Cook Inlet Regional Corporation, who owns several thousand acres of subsurface estate within the refuge, initiated a new exploratory well drill near Wolf Lake. The well site was chosen after an extensive two-year seismic program and, if the exploratory operation is successful, it could result in major expansion of oil and gas activities and facilities on the refuge. (Section E. 8)

The Regional staff frequently visited the refuge headquarters concerning Service function and other VIP's also visited the refuge headquarters. These included:

June 23,	FWS Director Robert A. Jantzen Regional Director Keith Schreiner ARD/WR Jan Riffe ARD/FR Jon Nelson ADF&G Commissioner Ron Skoog
July 7,	Washington, DC Legislative Staffers Jeff Curtis Steve Whimberg Brad Erickson Linda Findley Martha Pope
July 12,	FWS Chief Budget Officer Jim Leopold RO Chief B&F, Fred Nolke RO Budget Analyst, Don Lindberg
July 21,	Asst. Secretary Ray Arnett Asst. Dan Smith RD Keith Schreiner National Park Service RD John Cook
July 22,	Secretary Alaska Rep. Vern R. Wiggins
July 26,	WDC Wilderness Society Rep. Summnar Pingney
August 9,	Associate Director (WR) Dr. Bob Putz Staff Specialist John Carlson ARD/WR Jan Riffe RO, Refuge Supervisor Don Redfearn RO, Chief Wildlife Operations Skip Ladd
August 24,	Deputy Director FWS Eugene Hester RD Keith Schreiner
September 4,	Chief Secruity Bobby R. Williams (Sec. Watt)
September 23,	WDC, Acting Chief of Planning Linda Nebel

No biological highlights? JGB

NOT MANY REFUGE HAVE THESE ANYMORE WRC

You scare a threat the dignitaries during nice weather! TGB

B. CLIMATIC CONDITIONS

This year continued a three-year trend of below normal snowfall on the Kenai Lowlands and above normal winter temperature conditions. Indeed, December proved to be the mildest on record at Kenai with only a trace of snow and temperatures as high as 46 degrees. Total precipitation for the year was 15.56" which represented 4.35" below the normal of 19.91" (Table 1). Snowfall was less than one half the normal of 68.7" with only 32.6" recorded.

Table 1. Monthly temperature and precipitation data*.

Month	Temperature		Precipitation	
	High	Low	Total	Snow
January	32	-26	.15"	2.0"
February	41	-19	.58"	Trace
March	44	- 4	.76"	4.9"
April	49	10	.02"	1.3"
May	62	28	.49"	Trace
June	68	38	.99"	0
July	75	36	1.55"	0
August	72	33	2.00"	0
September	64	23	6.13"	0
October	50	- 6	1.36"	9.2"
November	45	-10	.93"	15.2"
December	46	-30	.60	Trace
38-Year Averate Total			19.91"	68.7"
Total for 1982			15.56"	32.6"

*Reported by FAA at Kenai Airport.

Primarily as a result of the past three years of mild weather conditions, the refuge moose population has increased by 45%. The 1982 winter moose population survey resulted in an estimated 5,000 moose, an increase from the last count in 1979 of 3,350 moose. Low snow depths allow the moose herd access to all available browse plants and movements are unrestricted.

The large lowland Skilak and Tustumena Lakes did not become ice covered until January 10. By mid-March almost the entire lowlands were free of snow.

Cold temperatures prevailed throughout March and April producing a near normal spring breakup period. Headquarters Lake became ice free on May 9 (normal), three weeks later that during 1981. The Kenai River became ice free on April 9, as compared to January 21, in 1981. Shore ice was still present along the Kenai River by mid-May. Swanson River became ice free on April 20.

A killing frost occurred in the Moose River Flats and the lower Funny River drainage on July 4 and 5. The frost killed new leaf growth on trees, particularly aspen.

September was abnormally cool and wet with over 6 inches of rain occurring. The wet cold conditions greatly reduced moose hunter activity hours and hunter take.

The first snowfall on the lowlands occured on October 7, and all lakes, except Skilak and Tustumena were ice frozen by the end of November.

C. LAND ACQUISITION

1. Fee Title

a. Alaska Native Claims Settlement Act (ANCSA)

1) Kenai Native Association, Inc. (KNA) - Under ANCSA, KNA was conveyed 18,083 acres of refuge lands March 21, 1980. Negotiations between KNA and the FWS regarding a possible land exchange culminated in a document "Agreement for the Exchange of Lands" executed by KNA January 22, 1982. Section 1302 of the Alaska National Interest Lands Conservation Act (ANILCA), provides for land exchanges between Native Corporations and the FWS.

This agreement provided for the return of 6,562 acres to the refuge in exchange for "clear title" to the remaining acreage, i.e., a title incumbered by the constraints of Section 22(g) ANCSA. In addition, KNA would have the right of free use of sand and gravel for the development of those lands and would receive as well title to the old Kenai National Moose Range Headquarters site and facilities in Kenai.

A public hearing April 26, 1982, to discuss this land exchange proposal between KNA and FWS, was held at the Kenai Peninsula Borough building in Soldotna. The negotiated land exchange instrument provided as one condition to the Unites States, the right to enter into this agreement within six months from the January 22, 1982 execution date. Unfortunately, this six month deadline lapsed and the KNA Board of Directors at an August 20, 1982 meeting decided to end all negotiations regarding this land exchange. That exchange agreement is now dead.

KNA has indicated interest in again pursuing the land exchange earlier negotiated following the election of new Board members and a new President, former KNA President George Miller.

2) Cook Inlet Region, Inc. (CIRI) - Under the Terms and Conditions for Land Consolidation and Management in the Cook Inlet Area, as clarified August 31, 1976, CIRI selected 10,240 acres of refuge lands adjacent and near the Kasilof River and Tustumena Lake. Following the Beaver Creek Settlement Agreement of May 18, 1981, this selected acreage was reduced to 7,040 acres in consideration for certain subsurface rights associated with land conveyances to other Native Corporations and

some lands adjacent to existing oil and gas field unitized areas. There were, however, no changes to this land status during the period and until conveyance occurs, lands remain under refuge management.

CIRI has selected under 14(h)(1) ANCSA several sites within the refuge as historical places. Five of these selections involve 365 acres of refuge lands located at: Russian River/Kenai River (5N, 4W, Sec. 32, 33; AA-11100); Upper Russian River (3N, 4W, Sec. 10); Hidden Creek (4N, 5W, Sec. 18 approximately 60a; AA-11099); Skilak Outlet (4N, 7W, Sec. 4 W/2, Sec. 5 SE/4; 40.5a.; AA-11102); Swanson Creek Village (8N, 10W, Sec. 15, 16a.; AA-11845). In addition, an unnamed site on Chickaloon Bay (AA-11819) and an unnamed cove on Skilak Lake (AA-11817) were unlocateable and recommended ineligible by the Bureau of Indian Affairs (BIA). Also, Chickaloon's Grave Site (9N, 4W, Sec. 8; AA-11821) was unlocated and disapproved as a cemetery site by BIA.

3) Tyonek Native Corporation - Since convenance of approximately 32,938 acres of refuge lands to the Tyonek Native Corporation under Interim Conveyance No. 173 dated April 6, 1979, there has been no change in the status of those lands. They remain as originally conveyed from the refuge.

4) Salamatof Native Corporation - Interim Conveyance No. 554, dated October 4, 1982, conveyed, to the Salamatof Native Corporation, 14,492 acres of refuge lands. Included were lands north of the Funny River Road, west of the Sterling Highway near Refuge Headquarters, 9,120 acres surrounding Elephant Lake and an additional 2,560 acres west of the Beaver Creek Oil/Gas Field.
The Salamatof Board of Directors approved access across their land and the removal of sand and gravel (title of which remains with the United States) in support of the proposed ARCO/CIRI Funny River Well No. 1 to be developed on refuge lands two miles south of Funny River Road.

5) Point Possession, Inc. (PPI) - Point Possession was denied certification as a village under ANCSA and did not appeal. The denial became final. A proposed Point Possession Settlement/Land Exchange was generally agreed to by PPI, CIRI, FWS, and Kenai Peninsula Borough representatives at a February 25, 1982 meeting. This exchange would require the conveyance of 304.32± acres of refuge lands to PPI (T 11 N, R 6 W, Sections 17 and 20), and the subsurface estate to CIRI.

A BIA letter, dated 29 November 1982, attached the BIA ANCSA Office report for the Point Possession Native Group (BLM No. AA-11128) recommending a Certificate of Eligibility be issued to PPI, "A Native Group Corporation, for the Point Possession group area."

Since the agreed to Land Exchange developed in March 1982, the PPI group has not yet submitted the agreement for final processing and approval.

2. Easements

The Homer Electric Association (HEA) removed pole structures and electric lines from the vicinity of Ski Hill Road. Those facilities had been utilized some years earlier in support of a public down hill ski tow under special refuge permit.

3. Other

a. Oil and Gas

1) Beaver Creek Field - Drilling operations continued on Beaver Creek Unit (BCU) No. 6 Well to a total depth of 15,928 on April 15. Brinkerhoff Drill Rig E-54 was pulled down and removed from Beaver Creek Well No. 6, after nearly eight months of drilling activity and a cost of more than nine million dollars. Both the Hemlock and G Zones were tested for commercial crude without success and both zones were abandoned. The well was plugged back to 7,550 feet and completed September 5 as a gas well.

A gas gathering pipeline system was installed throughout the Field, together with production facilities to handle produced gas. A 12-3/4 inch trunk gas line was also installed from the field area and generally paralleling the access road 3.34 miles to a connection location with Alaska Pipeline Company's (APL) 8-inch Royalty gas line in the NW/4 Section 7, T 6 N, R 10 W, S.M. During November all gas wells (1-A, 2, 3, 6, 7) were tested for a period of six days to verify the integrity of the system. Prior to testing, workover operations, using a small portable rig, were conducted on wells 1-A, 2, 3, and 7 to place them in condition for production.

The two crude production wells, 4 and 5R, together produce about 500B/D. Cummulative production through November 30, was 2,687,403 BBLs. All produced crude continues to be transported from the Field in 200 BBL tanker trucks to a North Kenai refinery.

Gas production from the BCU began for the first time in November. Approximately 20,000 MCF/Day are being produced to satisfy APL needs. Up to 40,000 MCF/D may be required during cold weather demands.

During September, an electrical distribution system was installed between the production facilities and well pads 1-A, 2, 3, and 7. This system provides the power necessary to operate the gas gathering equipment at each of these well pad locations in addition to inside/outside lighting.

Realignment of certain road curves along the BCU access road commenced March 18. The original access road, in support of early exploration activities, was constructed in 1967 and several spur roads have since been constructed. Removal of three 90 degree curves and road realignment at two locations resolved vehicle safety problems. The bridge, spanning Beaver Creek to Well No. 2, was replaced with a new steel supported wood deck structure.

The Marathon Oil Company, operator of the Beaver Creek Field, was high bidder on a 400 acre leasing parcel within the BCU unitized area, offered by the BLM in their September 1, drainage sale. The unleased acreage was offered for protective leasing purposes due to possible drainage of Federal lands from surrounding producing wells and to comply with the Unit Agreement that both the amount of resource produced and

land area under lease, provide the royalty structure and therefore amount of funds to the Federal Government.

Marathon's bid of $4,519,000 was one of five received for the tract. It was the first drainage sale the BLM has held in Alaska.

2) Swanson River Oil Field - This proved to be an unusually busy year on the "oil patch," in addition to the drilling of seven sidetrack/workover wells, for the first time in many years, two grassroots wells, SCU 31-8 and SCU 13-9 were drilled to completion. Nonetheless, for the time, money, and effort expended the resulting production proved disappointing. Cost of the two wells was nearly $6 million and they are still not productive.

This year was the 25th Anniversary of the Swanson River Field oil discovery. Celebrations July 21, at "Discovery Well" (Swanson River No. 1, now SRU 34-10), marking this event were attended by Assistant Secretary Ray Arnett, his assistant Dan Smith, Regional Director Keith Schreiner, and the Secretary's Alaska representative, Vernon R. Wiggins. Also in attendance were numerous oil officials, local dignitaries and the press. The Interior group later visited refuge headquarters and then attended a banquet in Kenai where Assistant Secretary Arnett was the principal speaker.

Why no mention of the subject of the speech! LRF

The Assistant Secretary, at the time oil was discovered in 1957, was the chief geologist in the Field for Richfield. During his talk he said, "The oil industry and wildlife are not an either/or proposition, but can exist in harmony." He continued by saying, "the Kenai area and Swanson Field should be an example for the rest of the country of how oil and wildlife can co-exist." We will strive to make his wish come true.

A trip to D'Arbonne would change his tune! LRF

A major modification and expansion of the Field's high pressure (5,700-6,000 gpsi) gas lift facilities required the workover of some compressor units and the installation within previously cleared rights-of-ways of nearly 39,000 lineal feet of 2, 3, and 4-inch pipe in support of this system. These extensive modifications expanded the gas lift facilities for certain formations within the Field. Approximately 325,000 MCF/D are reinjected into formations throughout the Field to maintain downhole pressures and subsequent crude production. Propane production is a spin-off of gas recovery/compression operations and is sold commercially. About 6,500 gal/day was produced during the year.

Field production continues to drop 10-12 percent annually and now averages about 7,800 B/D (barrels per day). Cumulative production for the past 25 years through December was approximately 195,352,000 barrels or about 43.2 percent recovery of the estimated original in-place crude. All revenue crude is shipped via Kenai Pipeline's 8-inch line facility terminating 19.6 miles west at a Nikiski tank farm.

Rebuilding of the 1-33 tank setting facilities was completed this period. The collapse of a 5,000 barrel water holding tank five years earlier began a chain reaction which burned and destroyed three buildings and four additional tanks and led to the rebuilding effort.

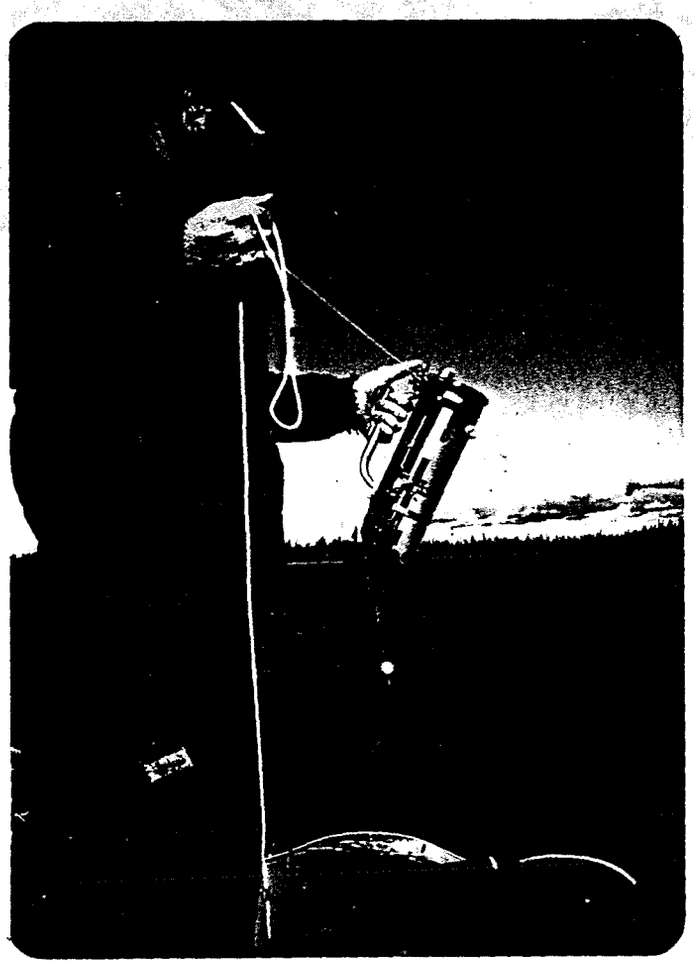
"Discovery Well," Swanson River No. 1 was nominated by the State of Alaska to the National Register of Historic Places. This well, still flowing, has produced more than 275,000 barrels of oil during its

In August, the Kenai Pipeline Company installed a new annode bed adjacent the old bed north of the 1-4 tank setting. This cathodic protection system prevents undue erosion of the underground pipeline transmission facilities.

In addition to the restoration of numerous disturbed areas associated with oil and gas activities throughout the Field, a major restoration project,covering several acres at the gravel pit source area near well pad SCU 21-8 was satisfactorily completed by Bob Tachick.

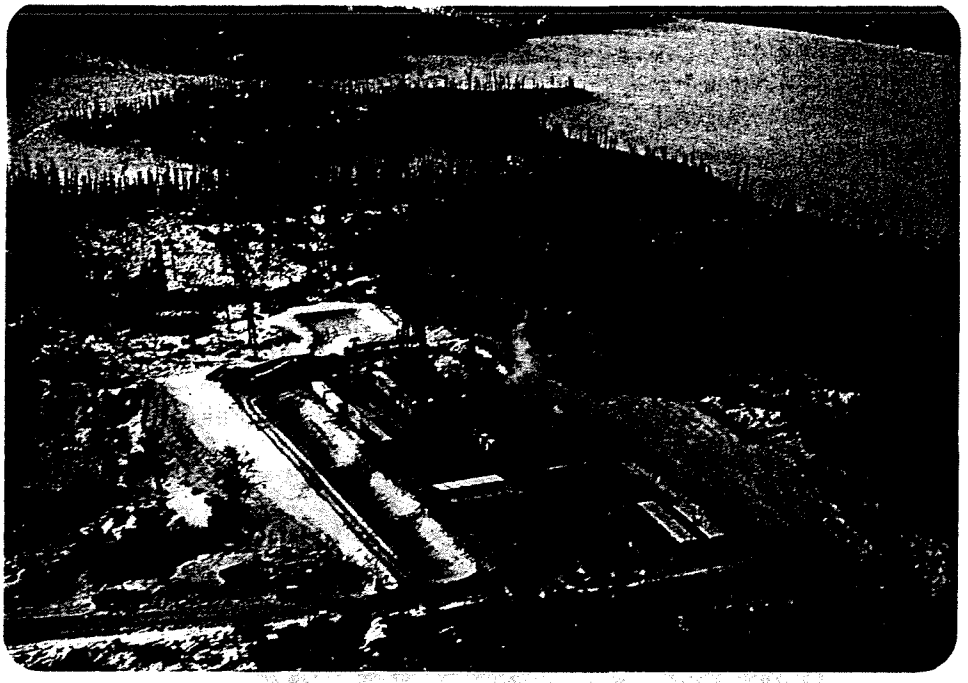
3) Alaska Pipeline Company (APC) - The APC receives for transport new gas produced for the first time from the Beaver Creek Field. This gas, transported from the Field through Marathon's 12-3/4 inch, 3-1/2 mile gas line, is accepted at APC's newly constructed "Measurement Building" near the 8-inch Royalty gas line. Gas received is accurately measured for payment as it passes through this building and continues into the 8-inch line and supporting transportation system to Anchorage users seventy miles north.

4) ARCO EXPLORATION COMPANY (ARCO) - Under agreement with Cook Inlet Region, Inc. (CIRI), ARCO is to explore for oil and gas within CIRI's partial subsurface estate. The first of three exploration wells was spudded-in December 6, at the ARCO/CIRI Wolf Lake No. 1 well site.



Assistant Fishery Project Leader Jim Freidersdorff, Kenai Station, determining water quality in Wolf Lake prior to ARCO's drilling. (Staff Photo)

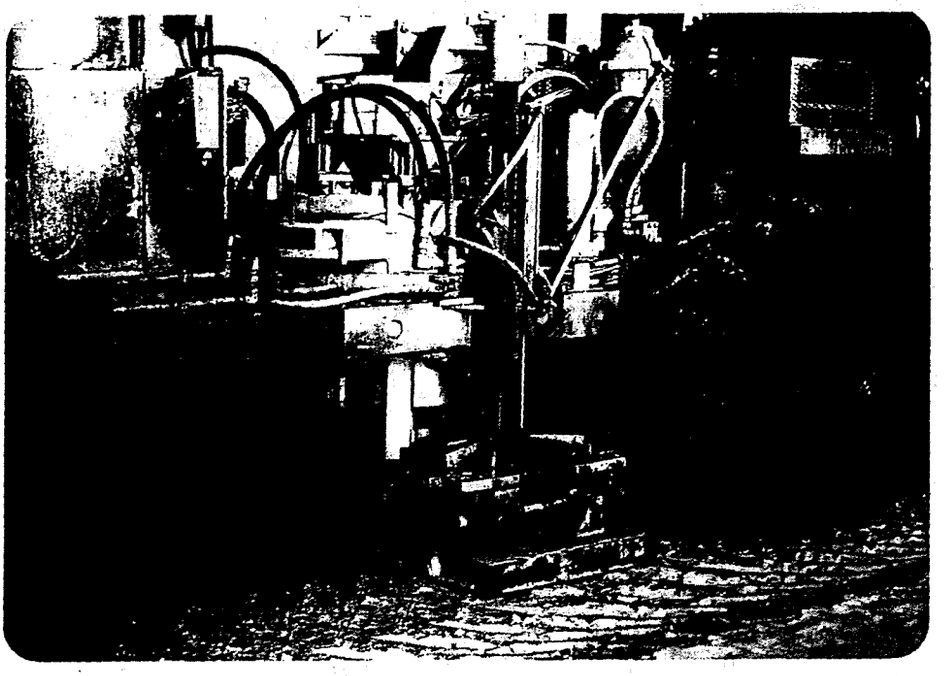
Access to this location was provided by the existing refuge road to the abandoned SCU 22A-32 well, drilled in the early 1960's by Standard Oil of California. The November construction of a 0.7 mile road spur and drill pad using 35,000 yards of gravel was necessary to support the Rowan drilling Rig No. 29, trucked from the North Slope after several years work in that region. It is interesting to note Rig 29 was returning "home" as one of the drilling rigs used during the early development of the Swanson River Oil Field 25 years ago.



ARCO/CIRI Wolf Lake Well No. 1. First oil/gas well drilled on the refuge by this Native Corporation. (Staff Photo)

5) Geophysical Operations - ARCO Exploration Company, under contract with CIRI to explore their subsurface estate for commercial deposits of oil and gas, completed a 560 mile seasonal three year seismic program April 7. This portable winter program was conducted using helicopters and, no off-road vehicle use or vegetative clearing was authorized. Certain portions of this program utilized vehicle mounted vibrators when existing roads were available and along selected seismic line routes. The results of this effort were acceptable, both to ARCO/CIRI and refuge interests. Formation mapping results provided at least two likely locations for exploration drilling, the now active Wolf Lake No. 1 well site and a proposed location 2 miles south of Funny River Road.

Vehicle mounted vibrator units conducting Vibroseis operations along Funny River Road. (Staff Photo)



Vibrator unit with extended 4x8 pad supports most vehicle weight. Pad shakes the ground through programmed frequencies to record transmitted energy reflected from subsurface formations.

The Swanson River Oil Field 40-man camp, located on abandoned pad SRU 22-23, was again utilized to support this season's program.

D. PLANNING

1. Master Plan

The Kenai comprehensive conservation plan is scheduled for completion December 1983, the first rough draft was completed in August 1982. This draft was edited and reviewed and forwarded to Washington for FWS review in December 1982. Key refuge staff members served as the planning team under the guidance of Regional Office Planner Norm Olsen. Staff members spent nearly full time on the plan from mid-May to August. The Assistant Project Leader at the Kenai Fishery Resources Station was designated as the planning team's fishery representative and most of his time during FY 1982 was devoted to this task.

The draft plan was generally well received in terms of content and range of alternatives considered. The plan's format will be restructured during final revisions in early 1983 and public hearings will be held in June-July, 1983. The format used for redrafting the Kenai Plan will be the model for future refuge plans in Alaska.

3. Public Participation

On June 1-4, a series of planning workshops were held in Soldotna concerning the Kenai Comprehensive Conservation Plan. The workshops were designed to collect resource expertise in wildlife, fisheries, or recreation, specific to the Kenai Peninsula, from outside the USFWS. Participants came from State, local, and Federal agencies, as well as private interests. At the workshops, the experts critically reviewed our inventory and, using their own experience and knowledge of the area and its resources, refined and added to it. They also identified various management options for resolving the problems they felt the comprehensive plan should address. A copy of the planning bulletin discussing these workshops is attached as an appendix to this report.

5. Research and Investigations

a. Wolf-Louse Study - Investigators: T.N. Bailey, E.E. Bangs, M.B. Hedrick, T.N. Spraker, R. Zanke, B. Taylor, C. Schwartz.

In the fall of 1981, a biting louse was found on 11 wolves (representing 3 packs) and one coyote that were harvested on the refuge. This observation was the first documentation of this louse in Alaska. The parasite is extremely irritating and caused affected canids to rub guard hair off their groin and upper back. Some loss of underfur was also noted. In 1982, the Alaska Department of Fish & Game, fearing the infestation would spread, recommended eliminating all wolves associated with G.M.U. 15A, totaling 40 to 80 individuals, through helicopter gunning. The FWS requested that the distribution of the problem be more fully identified, outside experts be contacted, other alternatives be considered, and public meeting be held. As a result, twenty-three wolves, representing 9 different packs, were captured and radio collared. Subsequent monitoring indicated the number of wolves on the refuge was approximately 20% lower than ADF&G track counts estimated,

the only infested packs in 1982 were those infested in 1981, pups were much more heavily infested than adults, and the louse did not appear to significantly effect wolf condition on the Kenai.

Public meetings indicated that many people wanted something done, but there was substantial opposition to killing wolves. An anti-parasitic drug (Ivermectin) was obtained and tested on three captive louse infested wolves. One wolf was given the drug in a meat cube, one by oral injection, and one by intermuscular injection. None of the wolves had lice when examined 10 and 20 days later. Acting upon this information, and ADF&G recommendations, all known infested wolves were treated with the drug by capture and hand injection. In 1983, treated baits will be placed near wolf killed moose to treat loner wolves, wolves untreated by injection, and possibly infested coyotes.

ADF&G Biologists Ted Spraker and Bill Taylor and PARM Mike Hedrick gather data from two wolves immobilized from the Quartz Creek pack. (Staff Photo)

b. Moose Research Center Studies - Investigators: A. W. Franzmann and C. C. Schwartz, Alaska Department of Fish and Game.

Research continued on the black bear project that was initiated in 1977. Black bears were captured in the vicinity of the Moose Research Center in the spring and monitored throughout the summer and fall. During the winter, bears were drugged in their dens and physiological data collected.

An experiment in moose reproductive biology, started in 1979, was attempted again in 1982. The experiment was to test the effect of late

breeding in moose. All bulls were removed from a one square mile enclosure in which 6 tame cow moose were held. The plan allowed cows to go through their first estrus cycle unbred, then a bull was introduced. This should test the effect of late breeding on moose calf production.

In May-June 1982, 35 moose calves were captured in the 1969 Burn and fitted with mortality radio-collars. Data indicated that mortality patterns in the 1969 Burn were almost exactly the same as occurred in the 1947 Burn study. Approximately 60% of the calves were killed by predators in the first six weeks after birth. Black bears accounted for 70% of the mortality, 10% by wolves, 10% by brown bears, and 10% by unknown predators or other reasons. This information disproves the hypothesis that bear predation is lower in open habitats. This study will be repeated in 1983.

c. Kenai black bears and cranberries - bear food habits and density. Investigators: Paul Smith. ADF&G and University of Alaska, Fairbanks.

This Master's thesis study deals with the food habits of black bears on the Kenai Peninsula lowlands with special emphasis directed at determining the importance of lowbush cranberry in bear diets. Also examined is the relationship between cranberry production and bear density. Thesis completion is scheduled for summer 1983. Kenai Peninsula bears appear to eat more animal material than indicated in other black bear food habit studies.

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

This project is being conducted by refuge personnel under a grant from Atlantic Richfield Company. The project started in November, 1980, with the capture, and collaring, of 60 moose, 30 in each of two study areas. In the Slikok Lake area, moose were tracked and observed to assess their response to a 4-month long seismic exploration program being conducted by ARCO for the Cook Inlet Region Corp. In the control area near Finger Lakes, there was no seismic program and moose were monitored to obtain data for comparison to the Slikok Lake area. The radio-collared moose were tracked from aircraft as often as weather permited. The final report to ARCO was completed in July 1982 and distributed to interested parties. Seismic activity did not appear to affect moose distribution or behavior. Radio tracking is continuing through 1983.

Ten radio-collared moose have died so far in the study, but some causes of mortality were unexpected. Four cows were killed by cars, three bulls were killed during hunting season, and another cow was poached during the moose season. One cow was killed by a brown bear and another had its leg caught in a tree fork and died. The latter moose, when found, had been dead two weeks but had not been fed on.

e. Alaska Department of Fish and Game Fisheries Projects

1) Hidden Lake - The Hidden Lake fisheries project was comprised of four separate phases in 1982:

a) Smolt Outmigration Phase - a record high number of sockeye smolt, estimated at 222,673, were produced by the Hidden Lake system in 1982. In addition, 18,790 cohoe or silver salmon smolt were also estimated to have passed down Hidden Creek.

b) Adult Escapement Phase - A weir on Hidden Creek was used to enumerate adult sockeye entering the Hidden Lake system. A total of 8,648 sockeye were counted with a peak between July 25-27 when over 4,000 adults (51.7% of total) passed through the weir. Of these, 150 adults were from 1978-fin-clipped hatchery fry, which suggested that hatchery released fish contributed 12.5% to the 1982 escapement.

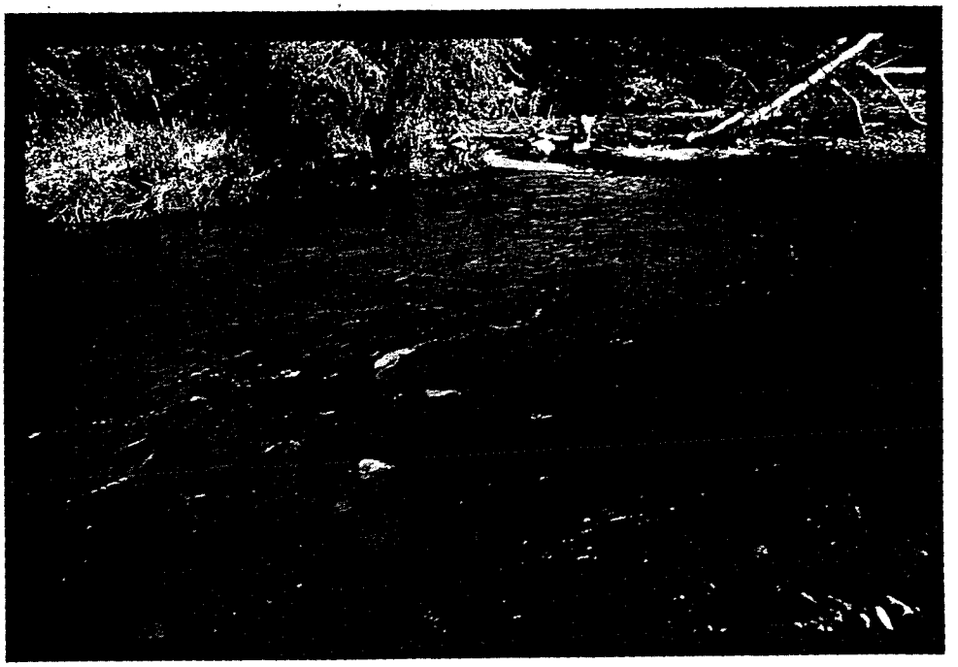
c) Sockeye Egg Take - An estimated 1,517, 964 eggs were taken from adults entering the Hidden Lake system in 1982. The goal was 3,000,000 eggs. No hatchery-reared sockeye fry were released into Hidden Lake in 1982.

d) Limnological Studies - Limnological studies designed to access the productivity of Hidden Lake were continued during 1982. These included studies of chemical and physical properties of the water and studies of plankton.

2) Swanson River Rainbow Trout Egg Take - Approximately 73,000 eggs from rainbow trout were taken by ADF&G, F.R.E.D. personnel in 1982. These are being used to provide brood stock for hatcheries throughout the State because Swanson River rainbows appear to have those genetic traits desired for rainbow trout stocking programs in Alaska.

f. Fisheries Research

A fisheries project on the use of Kenai River tributaries by juvenile salmonoids was initiated by Special Studies Fisheries Biologist George Elliot. Tributaries investigated include Slikok Creek, Soldotna Creek, and Beaver Creek. This project involved intensive stream surveys and mapping of wetlands areas connected to the tributaries.



Numerous refuge

The Kenai River king salmon studies under Carl Burger, Fisheries Research, continued in 1982 with emphasis on the early run. This third year of data on the early run and fourth year of data on the late run confirmed that the Killey River, which is totally on the refuge, is the most important early-run spawning area. The radio tagging of 60 early-run kings also indicated increased use of the Funny River in 1982 and at least one tagged fish in Quartz Creek. No use of the Russian River by tagged king salmon was documented. Some tagged kings remained in the Kenai River as late as the last week of June.

Fisheries Research crew on the Killey River. (Staff Photo)

E. ADMINISTRATION

1. Personnel

During 1982, the Kenai NWR had a staff of 12 permanent full time employees, 1 permanent part-time, 10 summer seasonals, and 12 volunteers. Our staff increased significantly since 1981 with the additional summer seasonals and volunteers (Table 2). The permanent full time staff has increased in recent years by two positions. However, the increase was only because of conversions of two career seasonal employees to full time permanent employees. In the past we have always had three to four additional employees in the career seasonal category but currently have none. We currently have less permanent employees than we have had in the past although our program has greatly expanded.

Table 2. Staff Breakdown from FY 1978 to FY 1982.

	Permanent			Temporary	Volunteers
	Full-Time & Career Seasonal		Part-Time		
FY78	9 FT	3 CS	0	8	0
FY79	10 FT	3 CS	1	9	0
FY80	10 FT*	4 CS	1	4**	0
FY81	10 FT*	4 CS	1	4**	1
FY82	12 FT	0 CS	1	10**	12

* (1 FT vacant due to lack of funds)
** (1 Temp. janitor vacant due to lack of funds)

Assistant Refuge Manager/Law Enforcement Vernon D. Berns transferred to the Alaska Peninsula NWR on February 20, 1982, and Asst. RM/ Interpretation and Recreation Linda K. Gintoli resigned effective May 14, 1982. Three new permanent employees entered on duty in 1982, Principle Asst. RM Mike Hedrick from Charles M. Russell NWR in Montana, Facilities and Maintenance Mechanic Ben Chio from Branch of Engineering, Atlanta, Georgia, and Supervisory Recreation Planner Mike Boylan from San Francisco Bay NWR.

All station position descriptions were rewritten in the Factor Evaluation Format System. Four positions were reclassified as follows: Wildlife Biologist GS-486-11 became a Fish and Wildlife Biologist GS-486-11, Administrative Clerk (typing) GS-301-5 became an Accounting Technician (typing) GS-525-5, Asst RM Interpretation and Recreation GS-485-11 became an Outdoor Recreation Planner GS-023-11, and Asst RM Oil and Gas GS-485-11 became Asst RM Oil and Gas (Pilot) GS-485-12.

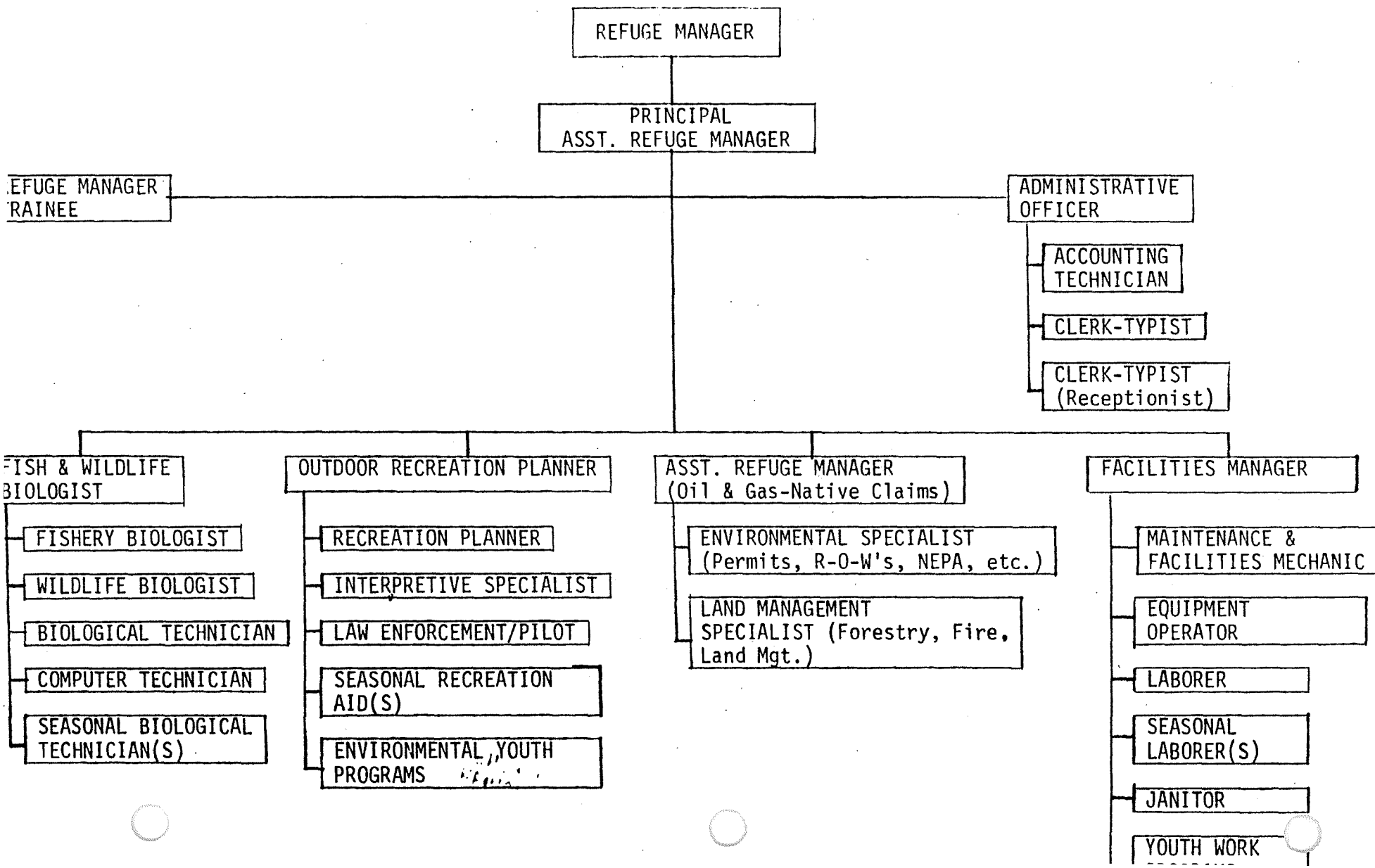
Effective May 30, 1982 Wildlife Biologist Edward Bangs was promoted from a GS-7 to a GS-9 Wildlife Biologist.

During 1982, one Incentive Award was presented. A Quality Step Increase was effective on December 27, 1982 for Accounting Technician Leslie Blaylock for her sustained exceptional performance during FY 1982.

Minor changes were made to our staffing pattern in 1982. Receptionist and Seasonal Typist was changed to Clerk/Typist (Receptionist), YCC under Recreation was changed to Environmental Youth Programs, and YACC under Facility Manager was changed to Youth Work Programs. Table 3 shows this refuge's current organizational chart.

November 23, 1982

Table 3. KENAI NATIONAL WILDLIFE REFUGE
ORGANIZATION CHART



2. Youth Programs

YCC

Although the nation-wide Youth Conservation Corps program was discontinued, the U.S. Fish & Wildlife Service chose to fund several YCC-type camps including one on Kenai NWR. Though there were some new features such as a less formal environmental education program, the new program was very similar to the familiar YCC.

Recruitment - Recruitment for the Kenai National Wildlife Refuge 1982 Youth Conservation Corps non-residential program was focused on two areas; Soldotna High School and Kenai Central High School. School guidance counselors distributed application forms and developed interest in the summer program.

Applicants were randomly selected by the YCC staff shortly after the school visits. Students were contacted by telephone and later by mail to inform them of their selection and to ask for their commitment in the eight-week program.
Kenai was assigned 15 YCC positions. Thirteen enrollees were initially selected for the program.

Orientation - A full week of orientation was started on June 14, 1982 at the Headquarters building in Soldotna. Goals of the Fish and Wildlife Service and YCC Camp were described. Enrollees were introduced to the Kenai staff and had an opportunity to see how each function related to the overall goals of the agency and camp.

Hard skills; tool use and safety, bear safety, survival skills, hypothermia prevention, and Red Cross eight-hour multi-media first aid course were developed. An equally important function of orientation was the demonstration and practice of soft skills. Effective listening and speaking, trust exercises, and group dynamics programs were used to develop group cohesiveness and es prit de corps.

Staffing/Supervisor - The Kenai Camp employed only two staff for the 1982 program. Almost all of the pre-camp planning, scheduling, and work project development was accomplished by the two individuals. The GS-7 position was filled by the camp director/supervisory group leader. A GS-5 position was used for the other leader slot.

Supervision was provided on a 24 hour a day basis while crews were participating in the ten-day tour using spike camps. Enrollees would return to their homes on a four day break between spike camps. Close group-living conditions and good staff/enrollee rapport resulted in very few discipline problems.

Environmental Awareness Program - There was a genuine interest by all enrollees for the environmental awareness program. Several structured field trips, presentations and field investigations were used to compliment the less structured daily topics. Students participated in the process of land management by attending the special public meeting on solid-waste disposal in the Kenai Borough. Problem-solving and

valuing were processes used at this meeting and in other YCC environmental education experiences. The Swanson River Oil Field, refuge moose pens, and Russian Lake salmon weir tours were some of the highlighted educational opportunities.

Both staff and enrollees agreed that too little time was invested in the EA program. Unfortunately, work production and accomplishment took greater precedence. For the first time since the YCC program has been founded, enrollees were paid a full 40 hour per week. This is compared to the old standard of 30 hours per week pay with ten hours of non-compensated environmental awareness activities.

Work Projects - Work projects were oriented around ten-day tour of duties. Work would begin on a Tuesday and progress through ten-days on the second Thursday of a pay period. Crews would not return home each night after work, but would 'spike out,' camping at the work site. Four days of leave were granted at the end of a spike, Friday through Monday, when enrollees would return to their homes.

This schedule had several significant benefits for the YCC program. Distance to work projects usually required long travel times. Using ten-day tour, work production was enhanced tremendously over a regular five day tour. Transportation was limited to the first and last day of the spike camp only. A full eight hours were available on the remaining eight days.

Our YCC crew improving an access point on the Swanson River Canoe Route. A bridge formerly crossed the river at this point. (Staff Photo)

In the more traditional schedule of Monday-Friday where crews returned home each afternoon, at least a quarter of the time was invested in travel to and from work projects. With the ten-day tour, there was the flexibility to work an additional hour to complete a project in the afternoon. This saved unnecessary start up time the following day.

It can be easily stated that work production was maximized and vehicle mileage and gasoline were minimized with the ten-day spike operations.

Numerous subjective benefits also developed with spike operations. In addition to obvious outdoor living skills, enrollees had opportunities in a close group-living environment to learn social skills. After the eight-week program, most enrollees had increased abilities of interacting with others; listening and speaking, giving and receiving feedback, and becoming more aware of their own values and ethics. Respect and understanding was encouraged between all enrollees especially when differences in social issues, values, or lifestyles developed.

The routine of daily camp chores was shared equally on a rotating basis. Menu planning, food preparation and clean-up and the responsibility for group sanitation were new experiences for most enrollees. For most, it was the first experience of actually cooking edible food for more than themselves. Some early attempts of cooking were later overshadowed with delicious successes!

The Kenai YCC Program lacked actual camp facilities for a residential program. The amenities of a residential program were made possible, at least to a degree, by using the ten-day spike operation. It is recognized that the activities and less structured time after regular work hours required additional planning and time investment for the two YCC staff. Both staff agreed that the after hours shared with the group may have been the most significant in regards to long lasting impact and benefit to each enrollee.

A YCC crew constructing a woodshed at the Swanson River Environmental Education Center. (Staff Photo)

Appraised values were estimated by using salary structure for WG-3 laborer positions and GS-5, Park Technicians positions. Cost of materials, travel time to and from projects and actual work time compared to similar projects accomplished by Refuge personnel were used in the computations. All appraised values have been reviewed and considered reasonable and accurate for this Refuge. Total appraised value for all projects is $16,415.00. Environmental work/learning hours total 3517.5.

4. Volunteers Program

The volunteer program became an important aspect of the Kenai National Wildlife Refuge staff during 1982. The volunteer program, though quite new, contributed significantly to the public use, wilderness management, and biological programs.

In most cases, volunteers were recruited to aid in the accomplishment of specific annual work plan goals. Specifically, volunteers contributed to the following projects during 1982: wilderness policy and management planning; back country trail patrol; maintenance on the Swan Lake and Swanson River canoe routes, Funny River horse trail, Skilak Lookout trail, Hidden Creek trail, Skyline trail, Fuller Lakes trail, and the Headquarters ski trails; public relations and information; general duties at Russian River Access Site; development of methodology, technical assistance and decision making for comprehensive planning; environmental education; audio visual program development, brochure development; moose hunter check stations; wildlife survey data compilation and wildlife surveys; biological examinations, habitat surveys, and wildlife transects; and clerical assistance.

A total of 3,218 person-hours were contributed during the year. Academic backgrounds of participants varied from high school education to two past Masters Outdoor Recreation Specialist. Two volunteers from Colorado State University were participating in student internships, one for completion of a Bachelor of Science degree and one for work toward his Ph.D. The Ph.D. candidate, Patrick Reed, was involved in a high level administrative and policy internship.

5. Funding

Table 4 displays Kenai's funding and manpower status from FY 1978 through FY 1982.

Table 4. Kenai National Wildlife Refuge funds and manpower patterns - FY 1978 through 1982.

FISCAL YEAR	1978	1979	1980	1981	1982
YACC Camp	N/A	N/A	2-10	5-22	0
PFT Manpower	9	9	9	9	12*
PPT Manpower		1	1	1	1
Career Seasonal	3	3	4	4	0
Temporary	4	6	5	3	5
Intermittent	3	1	2	0	0
Volunteers	0	0	0	1	12
YCC Staff	7	5	0	0	2
YCC Enrollees	30	20	0	0	13
MB	43,000	61,000	71,000	92,000	145,000
MNB	250,000	310,000	296,000	297,000	334,000
I&R	180,600	192,400	191,000	190,000	190,000
Exp. for Sales	32,000	32,000	37,000	49,000	55,000
Subtotal	505,600	545,700	595,000	628,000	724,000
I&R-Fee Area	N/A	11,750	7,500	7,300	7,300
BLHP	1,300,000	0	75,000	1,494,000	0
I&R Fee Area Rehab	0	0	0	0	52,700

*Conversion of 2 Career Season to PFT.

Station funding increased modestly this year and greatly assisted priority programs of facility maintenance. Special I&R Fee Area rehabilitation funds were used to upgrade the Russian River Fishery Access Area which receives over 60,000 visitors each year. Interpretation and Recreation O&M funding remained constant from last year, however, and experienced a slight decrease from prior year's I&R funding. To maintain current Station I&R facilities and public services at Service standards will require an additional $300,000 in I&R funds for the Station. Recreational facilities and I&R programs will continue to decline with current funding levels.

Migratory Birds and Mammals and Non-Migratory Birds funding increases this past year have provided the essential funds to upgrade key items of equipment to support these programs.

With the new Visitor Center operational, the Visitor Contact Station along the Sterling Highway reactivated, and maintenance of recreational and other refuge facilities at Service standards, this station requires, as a minimum, a $1,200,000 yearly base budget.

6. Safety

In keeping with the past, all serious accidents were involved with the visiting public.

There were two reported aircraft crashes on the refuge in 1982. The first incident involved a Cessna 207 with six persons aboard which went down while on a sight-seeing trip near Skilak Glacier. All on board were injured, but there were no fatalities. The plane was destroyed. The second incident occurred when a Cessna 150 on floats stalled over Mull Lake and heavily damaged the left wing and floats. Two persons were involved and one was injured.

Personnel injuries totaled six reported accidents and were equally divided among YCC and refuge staff. All were minor in nature and ranged from cut fingers to strained backs.

Again, this year, we devoted three days to defensive driver and first aid training, plus general orientation for our summer crew (including safety and procedures for obtaining medical assistance). Various staff members participated in the orientation . Region 7 Safety Officer Ginny Hyatt handled the defensive driver and first aid training.

Monthly safety meetings were held with chairmanship rotating each month. The monthly chairman was responsible for the monthly safety meeting and completion of accident reports.

Regional Safety Officer Hyatt visited Kenai on four occasions (including YCC inspection) during 1982. Most visits involved safety inspections on our new headquarters facilities.

The annual pilot ground school, presented by OAS/FWS representatives, was conducted November 29 through December 3. RM Delaney, ARM Richey, and SA Soroka attend the week's important presentations and discussions with other Service, NPS, USGS, and FAA pilots.

7. Technical Assistance

Local elementary schools from Kenai, Soldotna, Ninilchik, and Sterling participated in "Sea Week" during the months of April and May. "Sea Week" is an environmental education program sponsored by the University of Alaska to familiarize students with the marine environment. The refuge staff attended planning meetings and provided displays, learning materials, assistance to teachers, orientation, and conducted bird field trips to the Kenai River Flats.

For the past four years, the Kenai staff has served as judges for the annual Sterling Elementary School Science Fair.

Refuge Manager Bob Delaney and other Kenai staff provided technical assistance to Alaska State Parks on several occasions including the management of the lower Kenai River.

F. HABITAT MANAGEMENT

3. Forests

a. Only one commercial timber permit was active during 1982. Special Use Permit (SUP 02-82) allowed R. Habighorst to operate in two areas in T 4 N, R 10 W, Section 11 (6 acres) and Section 14 (20 acres). There will be no further permits issued to commercial timber sales until the Kenai Comprehensive Conservation Plan is completed because the management zones permitting such activities vary among different management alternatives.

This commercial timber harvest will provide saw logs for rough lumber sale. (Staff Photo)

No permits to cut Christmas trees on the refuge were issued in 1982, despite an initial interest on the behalf of several operators in the Anchorage area.

b. The record number of firewood permits issued in 1982 indicates a rapid growth in the number of people using firewood for heating purposes. Because of the increasing demand, potential commercial timber harvest areas must be viewed with caution, if the refuge expects to keep up with the demand for personal use firewood along easy access routes close to Soldotna, Kenai, and Sterling.

Table 5. Free-firewood permits issued on the Kenai National Wildlife Refuge, Alaska, 1976-1982.

Year	# of Permits
1982	723
1981	549
1980	543
1979	290
1978	411
1977	204
1976	194

12. Wilderness and Special Areas

Wilderness management during the calendar year, two years after wilderness designation, has been largely monitoring of ongoing compatible activities that previously occurred in what is now designated wilderness. Ongoing activities were reviewed for compatibility with the Wilderness Act and ANILCA. Incompatable activities in certain cases were discontinued.

Wilderness boundaries are now included in all leaflets except the aircraft brochure. Wilderness boundary signs were received from the contractor and were placed at several locations during 1982.

Hiker's contemplating the Kenai Wilderness near Tustumena Glacier. (Staff Photo)

Because of many exceptions and ambiguities of the ANILCA concerning wilderness management, a project was undertaken to comprehensively review all Acts, Congressional Records, Fish and Wildlife Policies, and past policies affecting Kenai Wilderness. In order to write a legal and appropriate wilderness management plan, the refuge believed an Alaska Wilderness Policy document needed to be developed to guide the overall effort. While the Refuge Manual and 50 CFR address wilderness management in general, the new policy will review new research concerning wilderness management and will interpret changes for Alaska Wilderness, initiated by ANILCA.

Patrick Reed, a doctoral candidate from Colorado State University (C.S.U.) was recruited to complete the comprehensive literature review required and actually write a draft Wilderness Policy for Alaska. Reed's background was exceptional and he was fortunate to have Dr. Glen Haas for a University consultant. Dr. Haas recently completed the Maroon Bells-Snow Mass Wilderness Management Plan on an Interagency Personal Agreement with the U.S. Forest Service in Washington, DC. Mr. Reed worked under the direction of Recreation Planner Johnston for six months as a Natural Resource volunteer and, he was also aided by a study grant from the Shell Oil Foundation. Mr. Reed's agreement with the Shell Oil Foundation as well as C.S.U. was that he participate in a high policy level internship. His work for the refuge fullfilled that requirement.

Volunteer Reed conducted what is believed to be the most thorough literature review to date within the Fish & Wildlife Service concerning wilderness management and wilderness policy in Alaska. The first draft of the policy was completed in mid-November and is currently under review by Mr. Reed, now at Colorado State, and the refuge staff. When complete, the final product will guide wilderness management policy, subsequent development of the Kenai Wilderness Plan and may help direct wilderness management on other Alaska refuges. Reed also developed two cataloged volumes of data keying excerpts of the Congressional Records with appropriate sections of ANILCA.

Wilderness management also received extensive discussion within the context of comprehensive planning for the entire Kenai NWR. Wilderness policy researcher, Pat Reed, participated in all discussions concerning comprehensive planning and wilderness in order to avoid divergent management direction between the draft comprehensive plan and wilderness management.

Actual field involvement in wilderness management reached a new high during 1982, aided by backcountry volunteers and the Youth Conservation Corps. Backcountry aids were involved with public contact, campsite impact inventory, regulation compliance, garbage pickup, portage and trail maintenance, and sign placement.

G. WILDLIFE

1. Wildlife Diversity

Additional information was obtained on a rare species on the refuge - the marten - during 1982. Several trappers reported observing tracks of marten on the extreme eastern boundary of the refuge in the Russian River and Surprise Creek drainages. One adult female was also taken by a trapper on the USFS land near the Russian Lakes. This information suggests a few marten may occur on the eastern boundary of the refuge, but additional observations are needed to confirm their presence elsewhere on the refuge. Potential habitat includes the Benchlands, and south of Tustumena Lake.

2. Endangered and/or Threatened Species

Since the identification of the falcons inhabiting the refuge has yet to be confirmed, it is uncertain if an endangered species nests on the refuge.

3. Waterfowl

Twenty-two trumpeter swans produced broods from at least 31 nests during 1982 (Table 6). Fifty-two cygnets in 15 broods averaged 3.5 cygnets/brood during the early brood survey in July. The late brood survey in late August revealed 68 cygnets in 21 broods for 3.3 cygnets/brood. Compared to 1981, there were fewer nesting attempts, fewer cygnets observed the first survey, and more cygnets observed the late survey. Average brood sizes were lower in 1982 than 1981, nesting appeared to occur later in the year during 1982 than 1981, and a number of traditional nest sites were not used for unknown reasons (Beaver Lake, Mink Creek Lake, Timberlost Lake, Grey Cliff Lake, Warbler Lake). Regulations were proposed to prohibit aircraft use of lakes with nesting trumpeter swans during the nesting and early brood periods.

Sixteen trumpeter swan cygnets were banded on 7 lakes in 1982 (Table 7), with blue neck and leg bands. In addition, 5 of the neck-banded swans were fitted with radio-transmitters to determine the extent of areas used by broods, to locate key staging areas, and to attempt to document if such birds return with their parents to the refuge in the spring. Two cygnets were located near Cordova and Yakutak after leaving the Kenai Peninsula, but none were reported on the wintering areas as of 31 December 1982.

Looking good, Bob.

ARM/Pilot Bob Richey preparing to release a trumpter swan cygnet fitted with bands and a backmount Telonics transmitter. (Staff Photo)

Table 6. Locations of trumpeter swan nests and numbers of cygnets observed on the Kenai Peninsula, 1982

Nest Location	Cygnets	Nest Location	Cygnets
Donkey Lake	2	Two Island Lake	0
Finger Lake	4	Lonesome Lake	4
Cow Lake	1	NW Lonesome Lake	3
Tony's Lake	2	Mystery Creek	0
Seneva Lake Area	4	N. Scenic Lake	0
Hook Lake	4	N. Trapper Joe Lake	5
Quill Lake	2	Camp Island Lake	6
N. Curlew Lake	0	Bear Lake	0
N. Pepper Lake	3	Grebe Lake	3
Campfire Lake	5	S. Brown's Lake	3
Dipper Lake	0	Bag Lake	3
Phalarope Lake	3	Pollard's Lake	1
Kugayuk Lake	4	Fox River	0
Otter Creek	3*	Fox Lake	5
Windy Lake	0	Kolomin Lake	0
Moose River	2*		

* = no nest located

Table 7. Trumpeter swan cygnets banded on the Kenai NWR, 1982.

Location	Date	Neck Band Numbers	Leg Band Numbers (559-)
Fox Lake	8/21/82	81VA, 82VA, 83VA*	21681, 21682, 21683*
Grebe Lake	8/21/82	84VA	21684
Camp Fire Lk	8/20/82	85VA*	21685*
Hook Lake	8/21/82	86VA, 87VA*	21686, 21687*
Phalarope Lk	8/21/82	88VA, 89VA, 90VA*	21688, 21689, 21690*
N. Pepper Lk	8/27/82	91VA, 92VA, 93VA	21691, 21692, 21693
Camp Island Lk	9/10/82	94VA, 95VA, 96VA*	21694, 21695, 21696*

* Also fitted with radio transmitter harness.

The snow geese arrived on the Kenai River Flats on 17 April 1982, reached a peak about 29 April, and were gone by early May. Many Canada geese were also observed with the snow geese in late April (Table 8). Arrival and departure dates suggested a later "breakup" in 1982 relative to 1981, a fact also suggested by trumpeter swan nesting chronology.

Table 8. Waterfowl observed on Kenai River Flats, 1982.

Date	Snow Geese	Canada Geese	Mallards	Pintails
4/19/82	225	220	3	0
4/21/82	832	337	2	106
4/26/82	3,020	420	-	--
4/29/82	4,900	0	-	--
5/03/82	218	265	-	--

5. Shorebirds, Gulls, Terns, and Allied Species

Gull colonies and double-crested cormorant nests were inspected at Skilak Lake on 8 June and 24 July, by Dave Nyswander and Sam Patten from the Wildlife Operations Office in Anchorage.

Hybrid gulls (glaucous-winged and herring gulls) used two nesting locations (Upper Skilak Rocks and Campground Rocks) in Skilak Lake (Table 9). In June, 472 nests were recorded. In July, a sample of 141 nests fledged an average of 1.63 chicks/nest. Only 7 cormorant nests were observed and these produced 9 chicks for an average of 1.29 fledglings per nest with eggs. One hundred and fifteen gull chicks were also banded with USFWS metal bands and black color bands.

Preliminary conclusions suggest the number of gulls have increased from 200 in 1936 to nearly 900 in 1982, the number of cormorants have decreased from 50 in 1936 to about 30 in 1982, the primary food of gulls was salmon remains, and the hybrid gulls on Skilak can be considered a "coastal" gull in contrast to the "interior" gulls of Lake Louise, northeast of Anchorage.

Two gulls banded in 1981 on Shadura Lake on the refuge were observed in Oregon and California during the winter of 1981-82. This suggests that at least some refuge gulls migrate south each winter. Gulls are known to overwinter in the Lower Cook Inlet, but no Kenai NWR-banded gulls have been observed there to date.

Table 9. Hybrid gull nests observed, average clutch size, and gull chicks banded on Skilak Lake, 1982.

Nesting Location	Nests Observed	Average Clutch Size	Chicks Banded	Chicks Fledged
Upper Skilak Rocks				
Subarea 1	226	2.57		---
2	118	2.52		---
3	69	2.58	45	110
4	23	2.91		39
5	7	2.17		---
Campground Rocks	49	2.67	70	78-81

6. Raptors

A survey of nesting bald eagles on 19 May, revealed 33 nests, 27 of which were active. Productivity surveys of 20, 27, and 28 July, indicated 18 nests with 34 eaglets for an average of 1.9 eaglets per successful nest or 1.3 eaglets per active nests. Six nests had 1 eaglet, 8 had 2 eaglets, and 4 had 3 eaglets. Most nests used in 1982 (Table 10) were also used in 1981. A nesting eagle on Gavia Lake, in the Swan Lake Canoe System, was given additional protection with signs alerting the public to avoid the area. This pair later successfully reared 2 young.

Table 10. Bald eagle nesting locations and productivity on the Kenai Peninsula, 1982.

Area	Inactive	Active	Eaglets	No Search	Search/No Location
Afonasi Lake		X	1		
Bear Creek					X
Beaver Lake		X	0		
Bedlam Creek				X	
Big Indian Creek			0		X Nesting
Birch Hill Coastal		X	2		
Bishop Creek Outlet		X	1		
Bradley River Outlet		X	0		
Camp Island	X				
Campfire Lake		X	1		
Camper's Lake		X	0		
Daniel's Lake		X	0		
Upper Fox River	X				
Gavia Lake		X	2		
Otter Creek		X	2		
Gene Lake		X	2		
Kenai R. (FR Powerline)		X	1		
Kenai R. (College Is)	X				
Kenai R. (Jim's Lndg)					X
Kenai R. (Near RR)		X	0		
Killey River (Lower)		X	2		
Killey River (Upper)		X	1		
Loon/Clam Lakes		X	1		
Mink Creek		X	2		
Moose Lake		X	3		
Moosehorn Lake	X				
Moose R. (Lowest)					X
Moose R. (Lower river)			2[1]	X	
Moose R. (Spruce Tree)		X	3		
Moose R. (West Fork)		X	3		
Pincher Creek Outlet	X				
Russian River		X	0		
Sheep Creek		X	3		
Skilak Inlet		X	0		
Sucker Lake	X				
Suneva Lake		X	2		
Swan Lake		X	2[2]		
Torpedo Lake		X	0		

[1] Only 2 eaglets captured.
[2] Eaglets banded and fitted with radio-transmitters

Five bald eaglets were leg banded and fitted with radio transmitters in 1982 (Table 11). In attempt not to handicap the young eagles, the transmitters were designed to fall off in approximately 4-6 months. Because of harness design, 3 of 5 transmitters were removed by the eagles within several weeks, contact was lost with another eaglet within two months and the 5th eaglet was located in Seward. These observations indicated at least one eaglet in the Moose River drainage moved south to the Kenai River/Skilak Lake area and then eastward into Seward.

Fish & Wildlife Biologist Ted Bailey is climbing to band and radio bald eaglets. (Staff Photo)

Table 11. Bald eagles banded and fitted with radio transmitters on the Kenai NWR, 1982.

Location	Date	Leg Band #.	Weight	# of Eaglets in nest
Campfire L.[1]	7/19/82	599-13325	12.5 lbs	1
Swan Lake [2]	7/22/82	599-13321	9.5 "	2
Swan Lake [1]	7/22/82	599-13323	11.5 "	2
Moose R. [1]	7/23/82	599-13317	13.0 "	3
Moose R. [3]	7/23/82	599-13320	12.0 "	3

[1] Eagle removed transmitter
[2] Lost location = Seward
[3] Whereabouts unknown

7. Other Migratory Birds

Passerine Bird-Forest Habitat Program - Passerine birds were censused in the 35-year-old burn (1947 Burn) on the refuge using the variable circular plot method. Twenty species were observed in 30 plots. A total of 241 observations indicated the most abundant species in the 35-year-old burn were Swainson's thrushes, yellow-rumped warblers, dark-eyed juncos, tree swallows, and gray jays in order of decreasing relative abundance (Table 12).

Biological Technicians Wally Jakubas and Mary Portner beginning a passerine bird census. (Staff Photo)

Table 12. Numbers of observations of birds in 30 variable circular-plots in a 35-year-old burn (1947 Burn) in June, 1982, on the Kenai NWR.

Species	# of Observations	Percent Occurrence
Swainson's Thrush	45	18.7
Yellow-rumped warbler	32	13.2
Dark-eyed junco	25	10.4
Tree Swallow	19	7.9
Gray jay	17	7.1
White-crowned sparrow	15	6.2
Ruby-crowned kinglet	14	5.8
Savannah sparrow	13	5.4
Gray-cheeked thrush	13	5.4
Orange-crowned warbler	12	5.0
Blackpoll warbler	6	2.5
Robin	4	1.7
Common redpoll	4	1.7
Common raven	3	1.2
Song sparrow	3	1.2
Olive-sided flycatcher	3	1.2
Greater yellowlegs	3	1.2
Black-capped chickadee	2	0.8
Wilson's warbler	2	0.8
Boreal chickadee	2	0.8
Marsh hawk	1	0.4
Pine siskin	1	0.4
Woodpecker(?)	1	0.4
Unidentifiable	1	0.4

These data, compared to relative abundances of birds in the 1969 Burn and 100+ Mature forest, suggest that the 35-year-old burn is optimum habitat for Swainson's thrushes, marginal habitat for white-crowned sparrows which were common in the 12-13-year-old burn, and is starting to provide some habitat for yellow-rumped warblers, the most common species in the 100+ year-old birch-dominated forest. One of the most adaptable species is the dark-eyed junco, which was relatively abundant in all forest successional stages.

An oranged-crowned warbler, banded in 1976 in southern California, was found dead (struck by a vehicle) on a Swanson River oilfield road in June. This may be a distance and longevity record for the species.

An orange-crowned warbler, banded in Southern California in 1976 was found dead in the Swanson River Oil Field in June 1982. (Staff Photo)

8. Game Mammals

a. Moose - a moose density count was conducted in 1982 and it was estimated that approximately 5,000 moose occupy the 2,000 square miles of moose habitat north of Tustumena Lake. This indicates the moose population is expanding rapidly, primarily believed due to mild winter weather the past three years. For the first time, the ADF&G conducted a moose density count south of Tustumena Lake. The population was an estimated 1,200 moose, a higher than expected number.

Fall composition counts (Table 13) varied widely but calf/cow ratios appeared fairly high. One point of future concern is the extremely low bull/cow ratios in some of the heavily hunted areas. If this trend continues, there may be a need to further restrict hunting activity in the more accessible areas of the refuge.

Table 13. 1982 Moose Composition Count Summary

Count Area	Bulls			Cows			Lone Calves	Unid	Dates of Counts	Total Count Time	Total Moose	Moose/ Ha
	45+	45-	Yelg	w/0 Calves	w/1 Calf	w/2 Calves						
15A-2	9	15	8	125	69	9	1	2	11/16&22/82	4.92hrs	325	66.0
15A-3	1	3	0	48	29	4			11/10&15/82	1.12 "	122	109.7
15A-4	0	1	0	5	5	1			11/23/82	1.00 "	19	19.0
15A-7	0	1	0	13	5	0			11/24/82	1.83 "	24	13.1
15A-8	4	3	0	32	7	0	1	3	11/16&26/82	3.07 "	57	18.6
15A-9	0	3	0	40	18	1			11/10&15/82	2.05 "	82	40.0
15A-10	0	0	0	9	12	0			11/15/82	1.62 "	33	20.4
Total	14	26	8	272	145	15	2	5		15.6 "	662	42.4

Recent research in moose survey techniques and an analysis of radio-collared moose on this refuge suggest that spring-fall composition count data may be of limited value because of variability due to sightability and weather conditions.

The moose harvest on the Kenai Peninsula was lower than last year, primarily due to lower hunter numbers and poor weather conditions (Table 14). Most of the moose harvest on the Kenai Peninsula takes place on the refuge in Game Management Unit 15A.

Table 14. Moose harvest on the Kenai Peninsula.

Harvest	1979	1980	1981	1982
15A	120	159	233	Unknown at this time.
15B (W)	28	41	48	
15B (E) (Trophy)	16	15	15	
15C	130	132	182	
7	37	24	45	
Total	331	371	607 (Includes 73 not listed to subunit)	

b. Dall's Sheep and Mountain Goats - Dall's sheep and mountain goat surveys were conducted in July, 1982, by the Alaska Department of Fish and Game (Tables 15 & 16). These data indicate that the refuge population of Dall's sheep is starting to increase. The goat population is recovering due to severely restricted sport hunting and, goats are recolonizing areas where they were once eliminated due to past overharvest.

Table 15. Sheep Survey Data, 1982.

Count Area	Total	Legal 7/8 Curl (M)	All (M)	(F)	Lambs
838	88		13	38	25
839	68		26	28	14
853	71		12	31	18
856	267	9	41	172	54
857	79	7	11	52	16

Two sheep hunters in Andy Simons Unit of the Kenai Wilderness. (Staff Photo)

Table 16. Goat Survey Data, 1982.

Count Area	Date	Adults	Kids	Unclassified	Total
836	8/9&13/82	90	23	--	113
839	8/5&9/82	62	20	--	82
840	8/13/82	62	14	--	76
857	8/3/82	29	13	7	49
858	8/3/82	26	12	--	38
859	8/5/82	52	23	--	75
862	8/6/82	64	24	--	88
865	8/6/82	53	20	--	73
	Totals	438	149	7	594

Forest Service personnel resurveyed a series of vegetation plots to analyze changes on sheep ranges on Forest Service and refuge lands. The yields for important forage species obtained in 1982 were remarkably similar to the dry weights obtained by Hansen and Nichols in 1972. Dry weight yields were 59 lb/acre of grasses and sedges, 697 lb/acre of shrubs and 17/acre of forbs.

Harvest of goats was up on the refuge this year due to a registration hunt after the permit hunt. Ninety-three goats were harvested, 69 goats were harvested by permit and 24 during the registration hunt. Sheep harvest was also up and may still be too high for the number of legal rams present. Twenty-three rams were harvested in 1982. Average horn length was 33.7" with an average age of 7.1 years.

c. Caribou - The number of caribou in the lowland herd was surveyed on October 25, 1982 (Table 17). A limited bull only permit hunt was again proposed for 1983. This hunt is strongly opposed by the refuge because of a lack of herd growth, but strongly supported by ADF&G, because the bulls are record class animals. In fact, shed antlers obtained from one radioed bull would have ranked first in the Boone and Crockett record books, had the animal been shot.

Over 50% of ADF budget is from ht hunters; HFH

Table 17. Caribou - Survey by helicopter by ADF&G, 1982.

Herd	Date	Bulls/ 100 Cows	Calves/ 100 Cows	# Calves	# Cows	# Bulls	Sample Size
Lowland	10/25/82	33	48	17	35	13	65
Upland	10/27/82	43	50	76	150	40	266

The major portion of the upland caribou herd's habitat, previously on Forest Service land, is now part of the Kenai NWR with the passage of ANILCA. The herd inhabits a mountainous-alpine zone on the new extension in the NE portion of the refuge. This herd was surveyed by ADF&G in October (Table 17), and data suggests the herd is healthy with good production and recruitment. A harvest of 21 animals was obtained by issuing 150 permits.

d. Black Bear - ADF&G research biologist, Dr. Chuck Schwartz, continues his research on black bears. He estimates the 1947 Burn is prime black bear habitat and has approximately 6 bears per 10 square miles.

Black bears were captured and radio-collared in the 1969 Burn. Preliminary results indicate a surprisingly high black bear population, approximately the same density as that of the 1947 Burn population. Bears appear to prefer using unburned stands in the Burn or the areas along the edge of the Burn. The work on black bears has been funded as a long term project by the ADF&G and is scheduled to continue to at least 1986.

e. Brown Bear - The brown bear population remains unsurveyed on the Kenai Peninsula. Harvest is increasing rapidly, both by sport hunters and bears taken in defense of life and property (Table 18). The relatively high mortality rate of brown bears, and the guarantee that defense-of-life-and-property bear kills (6 in 1982) will increase as the human population increases, strongly indicates a need for brown bear inventory work on the refuge.

Table 18. Bear harvest on the Kenai Peninsula, 1982.

Black Bear

Units	1982	1981	1980
Total	116	158	237
15A		43 (32M/11F)	37 (19M/15F/3Unk)
15B	82 (54M/25F/3Unk)	23 (14M/9F)	43 (21M/22F)
15C		30 (21M/9F)	76 (50M/25F)
7	34 (24M/8F/2Unk)	69 (42M/22F/5Unk)	56 (44M/12F)
Unk		6	12 (9M/3F)

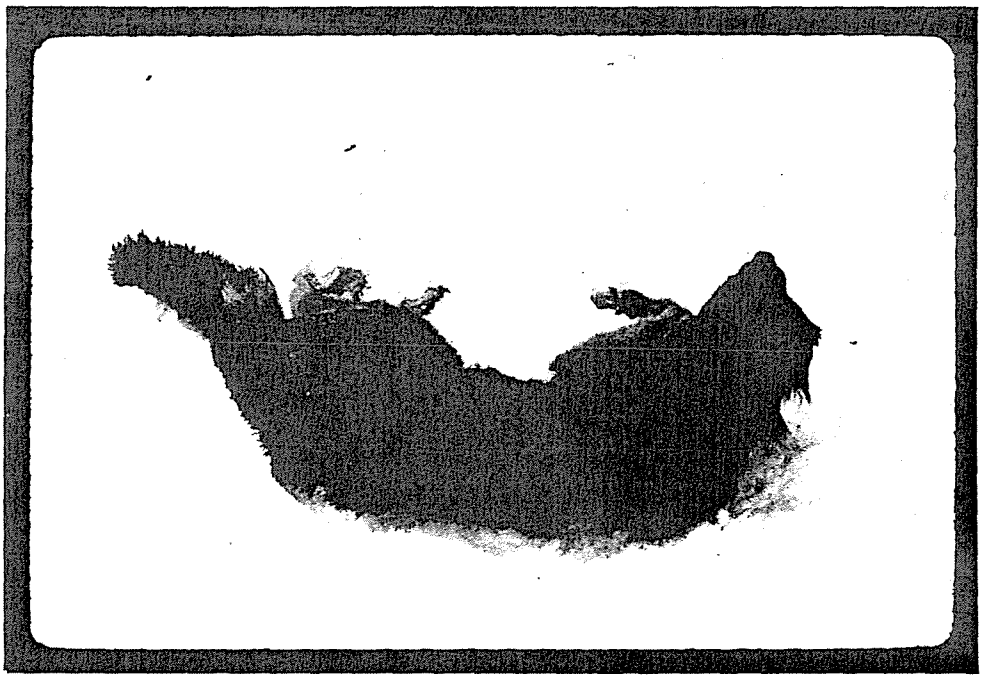
Brown Bear

Units	1982	1981	1980	1979
Total	21 (Unk)	18 (9M/9F)	14 (5M/9F)	4 (2M/2F)
15		15	11	4
7		3	3	

f. Wolf - Wolves continued to be controversial on the refuge in 1982, especially after the local ADF&G Area Biologist recommended aerial gunning of lice-infested wolves on the refuge to "control" the spread of lice. Lice had been documented in wolves from 3 packs and in at least one coyote the previous year (1981). Concerned about the lice in the refuge wolf population, their potential for spreading into adjacent packs and off the Kenai Peninsula, the initial recommendation was to remove all infected wolves.

Contact with experts in parasitology and wolf ecology revealed divided opinion with the parasitologists favoring wolf removal and the wolf ecologists claiming complete removal was highly unlikely and that the source of the infestation needed to be identified and controlled. After a number of inter-agency and public meetings, a decision was made to try an experimental drug (Ivermectin) which appeared to kill all the lice on captive wolves, instead of aerially gunning the infected wolves.

In summary, 25 wolves in four packs were captured, treated with the drug, tagged or radio-collared, and released. Wolves from 5 other packs on the Kenai Peninsula were also examined and found to be lice-free. Although the cost of the operation exceeded $30,000.00, it was felt that the effort was beneficial to the infested wolves, to the refuge-wide wolf population, provided much new scientific knowledge on ectoparasite wolf relationships and treatment, and satisfied the majority of people, trappers, protectionists alike, regarding refuge wolf management priorities.



A wolf heavily infested with lice taken by a trapper from one of the lowland packs. Note the loss of guard hairs on the back. (Staff Photo)

Harvest of wolves by trappers continued throughout the wolf-lice controversary with at least 20 wolves taken in 15A, 6 in 15B, and 2 in 15C. Monitoring of radio-collared wolves, as part of the wolf-lice program, revealed that the initial ADF&G wolf population estimate for 15A had over-estimated the actual population by 25% (20 wolves).

The success of the drug treatment program on the wolf population will not be known until 1983, when previously-infected wolves are examined and/or turned in to ADF&G or Service personnel during the furbearer season in 1983-84. Continued disruption of the wolf packs on the refuge by trappers and hunters will undoubtedly assure continued biological problems with, and public controversy over, the refuge wolf population.

g. Other Furbearers - The population levels of other furbearers on the refuge is unknown. Harvest data is an unreliable indicator since trappers' success depends on numerous factors not related to furbearer population levels. Generally, catches of both land furbearers and aquatic furbearers were high (Table 19). This is primarily due to the good weather conditions during the 1981-82 season. The staff is concerned that the lynx harvest was only 19 animals, while hare populations are very high in many areas. It is likely that in some accessible areas of the refuge, recreational trapping has greatly reduced some furbearer species.

A lynx study was initiated on the refuge in 1982 to determine if a more intensive study was feasible and to obtain some baseline information on the refuge lynx population. Seven lynx were purchased from furtrappers, immobilized, and fitted with radio collars. Monitoring of these radio-collared lynx has suggested relatively large home ranges, home range sizes dependent on habitat quality, and relatively few lynx in the northern lowlands. Monitoring will continue throughout the lifespan of the radio transmitters.

Trapped lynx that will be purchased from the trapper and fitted with a radio transmitter. (Staff Photo)

Preliminary harvest data suggests that although the lynx population is increasing, it is about only 30% of its former level or potential level compared to the last natural high population peak.

Table 19. Total reported furbearer harvest on the Kenai National Wildlife Refuge, 1960-1982.

Season	Total Permits	Land Furbearer					Aquatic Furbearer			
		Lynx	Coyote	Wolverine	Weasel	Wolf	Beaver	Otter	Muskrat	Mink
1960-61	16	13	15	1	1	--	145	16	2	42
1961-62	24	23	30	4	13	--	79	19	0	69
1962-63	28	28	27	2	0	--	109	19	2	66
1963-64	33	28	39	1	6	--	150	26	0	83
1964-65	17	24	11	6	10	--	6	3	0	15
1965-66	16	17	16	4	2	--	17	4	0	13
1966-67	25	7	5	4	35	--	22	9	0	45
1967-68	---	---	--	--	---	--	---	--	---	---
1968-69	22	18	44	1	81	--	14	10	207	64
1969-70	58	62	23	3	35	--	33	32	75	82
1970-71	59	67	30	10	79	--	25	9	29	60
1971-72	61	181	13	14	35	--	23	8	18	9
1972-73	65	146	51	8	4	1	76	24	111	48
1973-74	81	245	58	7	149	0	40	26	334	160
1974-75	52	162	24	10	68	0	6	8	21	33
1975-76	70	113	32	6	16	1	34	13	82	25
1976-77	86	53	25	6	10	2	24	7	8	39
1977-78	86	43	34	4	14	8	19	9	140	33
1978-79	96	36	44	3	7	32	22	6	73	25
1979-80	104	12	64	3	58	19	83	17	127	57
1980-81	102	2	38	0	14	16	82	30	191	111
1981-82	104	19	66	4	70	44	61	26	183	119

9. Marine Mammals

Michael Meeks reported seeing a harbor seal in Skilak Lake near the Kenai River outlet on October 26, 1982. This sighting was unconfirmed, but may represent the farthest location a seal has traveled up the Kenai River system.

10. Other Resident Wildlife

The population of snowshoe hare on the Kenai Peninsula is expanding rapidly as the 10-year cycle continues towards a peak, which is expected next year. Hares are common and sought after as a small game species. It is not uncommon for a hunter to bag more than a dozen for a day's effort. Trappers have reported finding some hares that died without reason, and in some areas hare browsing is extensive and is killing some hardwoods.

The red-backed vole and common shrew dominate the small mammal community. Relative densities appear low compared to previous years and most of the decrease was in the red-backed vole population (Tables 20a, b, & c). This is the first time since small mammal studies began in 1975 that such a sharp drop was evident. Unfortunately, an early heavy snow cut small mammal trapping short and the sample size for 1982 was small. More intensive trapping is scheduled for 1983 to document if the drop in small mammal numbers was real or an artifact of sampling error.

Table 20a. Small mammal trapping data on the Kenai NWR, 1982.

Area	Date	Trap/Night	Mammals captured/ 100 trap nights*
Willow Lk. Mature Crushed	10/5-7/82	270	8.9
Mature Uncrushed	10/5-7/82	270	8.5

*Further breakdown unavailable at this time.

Table 20b. Small mammal data on the Kenai NWR, 1981.

Area	Date	#Trap/nights	Captures/100 trap nights Cr*	Sc*	Sv*	Mp*
Willow Lake Mature Crushed	9/29-10/2	360	23.3	5.5	0.3	0.3
Willow Lake Mature Forest	9/29-10/2	360	11.7	1.9	0	0
Sunken Island Lake 1969 Burn	10/20-10/23	360	8.3	7.5	0.5	0
Sunken Island Lake 1947 Burn	10/20-10/23	360	5.0	0.3	0	0
Headquarters Lake Mature Forest	10/20-10/23	360	13.1	4.4	0.3	0

Table 20c. Small mammal data on the Kenai NWR, 1980.

Area	Date	#Trap/nights	Captures/100 trap nights Cr*	Sc*	Sv*	Mp*
Willow Lake Mature Crushed	10/7-8	180	22.8	2.2	2.2	0
Willow Lake Mature Forest	10/7-8	180	13.3	3.8	1.1	0
Sunken Island Lake	10/16-17	180	7.2	1.7	1.1	0

*Cr = Redback Vole
Sc = Common Shrew
Sv = Vagrant Shrew
Mp = Meadow Vole

With the exception of beaver, there is currently no practical, cost-efficient methods for censusing furbearer populations on the Kenai National Wildlife Refuge. Population trend data is obtained from ADF&G sealing forms and a mandatory furbearer harvest report that is issued with a refuge trapping permit. The period covered by these permits and harvest data is the winter of 1981-82.

The very low catch of lynx (a highly sought species) at a time when hares were abundant, raises concern that this species is being overharvested during its naturally occurring low cycle. The trapping season also extends beyond when wolves breed and presents the possibility that the entire reproductive effort of a pack could be eliminated with the capture of the alpha female in March. Trapping for wolverine occurs when females are nursing young and could present problems in regards to harvesting only surplus animals. Heavy trapping pressure on the Kenai may necessitate more restrictive bag limits or seasons in the future, and recommendations were sent to the State Board of Game to shorten trapping seasons in the future.

The large variation in catch, caused by non-biological factors, show the unreliability of harvest data to manage furbearer populations on the refuge where trapping is almost strictly recreational and is conducted regardless of furbearer population densities. It also emphasizes that without population data, the impacts of trapping on refuge furbearer populations remains unknown. While this may be of little concern for high density or prolific species such as muskrat, mink, or weasel, trapping may and already appears to have significant impacts on low density, low-productivity furbearers such as lynx, otter, beaver, and wolverine. Some furbearers such as marten and red fox are extremely rare on the refuge and should be given needed protection.

11. Fisheries Resources

Tustumena Lake Sockeye Salmon Study - The second year of investigations on this proposed 5-year study were completed during 1982. This is a cooperative study between the Alaska Department of Fish & Game (ADF&G) and the Fish & Wildlife Service (FWS). The objective of this multi-faceted study is to determine which sockeye fry stocking densities and procedures provide the maximum survival of stocked fry without detrimental impact to natural sockeye stocks in Tustumena Lake.

The FWS is particularly involved in developing and implementing two techniques which are critical to this study and should have a wide range of applications elsewhere. The first technique is the use of hydroacoustics to obtain sockeye fry population estimates and determine their spatial and temporal distribution several times during the year. The second technique is the use of oxytetracycline (otc) marking and recovery analysis for evaluating fry stocking. Otc is an antibiotic contained in hatchery diets for sockeye which concentrates in bony structures and can subsequently be detected with a spectrofluorometer. Although data analysis for this year has not been completed, both techniques are providing interesting, useful, and encouraging results.

Through the use of hydroacoustics, population estimates have been obtained and much previously unknown information relative to the horizontal and vertical distribution of sockeye fry in Tustumena Lake has been obtained. The FWS has contracted through Dr. Richard E. Thorne, University of Washington, for technical expertise and analysis of hydroacoustic data.

Otc analysis has demonstrated that trace amounts of otc in fish can efficiently be extracted and measured. Further, the time necessary to feed sockeye fry a diet containing otc in order to obtain a 100% otc mark retention has been determined. This mark recovery method appears to have the potential to replace fin-clipping in specific applications.

16. Marking and Banding

See Bald Eagle and Trumpeter Swan sections.

H. PUBLIC USE

1. General

Destination public use was increased from 168,500 persons recorded utilizing the refuge in 1981. Monthly use records show that 253,000 persons utilized the refuge during 1982 for destination visits. It is generally thought that this, and past year's use estimates are somewhat under actual visitor use. During 1982 visitor use and user trends were analyzed for the Comprehensive Conservation Plan. In that analysis, it was determined that incidental use occurring along various roads including the Sterling Highway and busy portions of the lower Kenai River were not being included in monthly visitor use reports. When a percentage of Sterling Highway use is included, as well as Kenai riverboat traffic, use figures increase significantly. In the comprehensive planning document demand analysis, completed in 1981, 668,000 people were estimated to be utilizing the refuge annually.

In further refinement of user trend discussion, discussed in the 1981 Annual Narrative, overall annual visitor increase is expected to be approximately 2.4 percent per year. This is significant in that over a ten year period, overall use could increase a full twenty five percent.

All aspects of the public program received management attention during 1982. Several volunteers and seasonal Park Technicians were utilized to increase production in all aspects of the public use program.

A week long orientation was conducted for summer employees to increase awareness and training for employees involved in face-to-face visitor contacts, regulation compliance, and visitor safety.

Youth programs were utilized primarily to support public use facilities and trail maintenance.

In support of Comprehensive Planning and Recreation Management Planning, a detailed report was completed describing all aspects of the Kenai NWR public use program past and present. The report is entitled: Kenai National Wildlife Refuge Outdoor Recreation Report and Planning Classification. Seventeen 1:250,000 mylar maps, depicting various activities both on and off refuge land on the Kenai Peninsula, complement the report. The mylar maps that relate to activities also include location specific use information. The following is the list of overlays developed:

OVERLAY RECREATIONAL MAPS

Map No.

1. Access for Public Use
   - Hiking, snowshoeing, x-country skiing, skating
   - Aircraft
   - Auto
   - Dog sled
   - Horseback riding
2. Boating/canoeing/rafting
   - Motorized
   - Non-motorized

3. Snowmachining
4. Commercial Operations
    - Guiding, hunting
    - Guiding, upland, non-consumptive
    - Guiding, rafts and canoes
    - Guiding, fishing
    - Fly-in tent camps
    - Ferry service
    - Significant air-taxi drop-off
5. Information and Interpretation
    - Interpretive/exhibits
    - Environmental education
    - Visitor Contact Facility/personal services and contact
    - FWS information
    - (Potential sites)
6. Big Game Hunting
    - Sheep/goat
    - Caribou
    - Bear
    - Moose
7. Small Game Hunting
    - Waterfowl
    - Small, upland game
8. Trapping
9. Fishing
    - Cold water (Trout, Dolly Varden, Char, Grayling, Salmon/Steelhead
10. Camping and associated non-consumptive activities (on and off refuge; private or public)
    - Developed
    - Dispersed
11. Watersystems of significant public value
    - Kenai River
    - Kasilof River
    - South Cook Inlet
    - Kachemak Bay
    - Swanson River
    - Chickaloon River
    - Six Mile River

Map No.

12. Special Values Related to Public Interest
    - Legislated wilderness
    - Defacto wilderness
    - Research natural areas
    - Moose Research Center
    - Archeological Site
13. Special Values (continued)
    - Unique physical and geological values
    - Wildlife viewing
    - State and National significant recreation opportunities
    - Designated National Recreation Trails
14. Special Values (continued)
    - Scenic values

15. Economic benefits and recreational gathering of refuge products
    - Gold
    - Timber products
    - Oil and gas
    - Berry gathering
    - Subsurface ownership
    - Surface lands-conveyed/potential
    - Off refuge timber harvest (incomplete)
    - Private inholders
    - Gravel
    - (See trapping map)
16. Structures
    - Personal dwelling/private cabins
    - Semi-permanent shelters
    - FWS cabin-avg-good condition
    - FWS cabin-avg-poor condition
    - FWS cabin-avg-remains only
    - Industrial facilities
    - Administrative facilities
    - Sanitary facilities
    - Off-refuge cabins
    - Native allotments
17. Recreation Facilities Map
    (Present recreational facilities are keyed to definitions for each category of facility on supporting charts.

Installation of headquarters major entrance and sub-entrance signs was completed during 1982. These attractive new signs will help to create a positive public image for the Kenai NWR.

2. Outdoor Classrooms - Students

Recreation, volunteer, and biological staff provided leadership for several occasions to local schools and organized groups. Topics explored during the year included wildlife adaptations, wildlife habitats of Kenai NWR, wildlife populations, recreation opportunities, and wildlife research being conducted on the Kenai NWR. Several grade school groups utilized the Swanson River Environmental Education Site during May. Refuge support included facilities and leadership services by refuge staff. Refuge staff also provided support for Outdoor Week sessions during May.

3. Outdoor Classrooms - Teachers

Environmental Education curriculums for use by local school groups, ages 7-16, were completed during 1982. The curriculum utilizes refuge wildlife and outdoor learning activities to support local school district science objectives. Several contacts with local teachers, as well as school officials, were initiated in support of completing the curriculum guides.

6. Interpretive Exhibits/Demonstrations

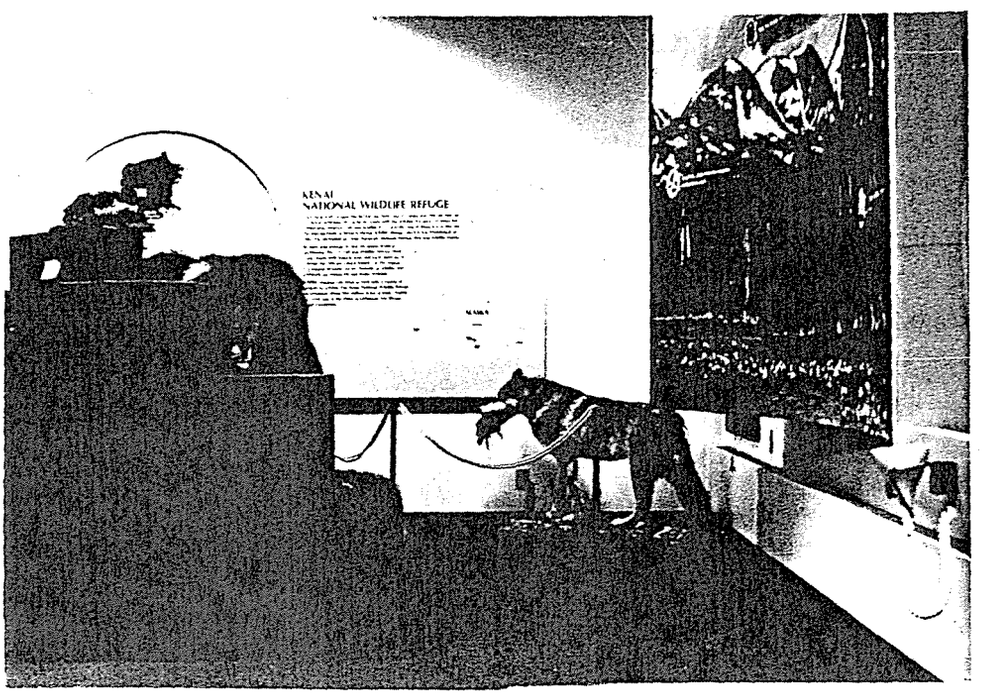
The Headquarters Visitor Center continued to offer temporary wildlife exhibits until October, when Good Industries of Ohio installed the long awaited professional exhibits. Refuge staff provided continual support to Good Industries throughout the year during the developmental stages of the exhibitry.

Some exhibit frames were damaged in transit, though installers repaired all damage before the project was accepted. The completion of the exhibit center marked a new era in offering a high quality interpretive focal point at Kenai NWR. By early December, plans were underway for weekend programs starting January 1, 1983.

The new exhibit center features 15 formal exhibits, 6 pictoral panels, wildlife mounts, and a user operated videodetic unit which could be programmed for up to 20 3-minute programs.

The theme of the new exhibit, "The Living Landscape," concentrates on the living ecosystem of the Kenai Peninsula and is designed for one-time interpretive information and refuge orientation, as well as repeated environmental education by Kenai Peninsula residents and school groups.

The narrated slide program, "The Living Kenai," was shown to many groups and individuals during 1982, and will continue to be shown in conjunction with first time refuge visits.



One corner of the new Kenai Headquarters Visitor Center. (Staff Photo)

In conjunction with the installation of the new exhibit center, four detailed brochures were developed and illustrated by refuge staff. Various brochures will be dispensed at associated exhibits throughout the center. As compensation for Visitor Center installation delays, contractor Good Industries printed and delivered 10,000 copies of each brochure. Titles include:

1. Succession and Populations on the Kenai
2. The Habitat Triangle Food, Water, Shelter
3. The Web of Life on the Kenai
4. Aquatic Resources of the Kenai

(Copies of the brochures are in the back of this report.)

Add these in front of the NR so we can see them

The 6-panel, self guiding sockeye salmon and historical exhibits for the Russian River Access Site, developed in 1980, were on display from June through September. During the winter the exhibits were on temporary display at the Headquarters, or on loan to local schools. They were utilized by local schools during 1982 Sea Week.

7. Other Interpretive Programs

As discussed in the 1981 annual narrative, several locations throughout Kenai NWR provide excellent opportunities for information dispersal. The majority of these areas received increased emphasis by posted information and educational material on existing bulletin boards. As of February 1982, 26 locations featured refuge information varying from bulletin boards to the new exhibit center.

The headquarters continued to offer refuge information, general U.S. Fish & Wildlife information, adjacent Federal and State agency leaflets, and Alaska Natural History Association educational materials.

Refuge leaflets available included a 1981 updated Canoeing brochure; Common Birds of the Kenai National Wildlife Refuge; snowmobile regulations; a bear safety leaflet; an aircraft use leaflet; a new general refuge brochure (see copy inserted); and the new general National Wildlife Refuge brochure which fortuitously displays a Kenai Peninsula cover photo. As of February 1982, 58 different leaflets or handouts were available at the refuge headquarters visitor center.

The new refuge general leaflet was developed during 1982 and printed in May. Ten thousand copies were printed in the initial printing. Topics covered in the brochure include: local historical prospective; visitor orientation; campground information; fisheries information; wildlife species facts; regulations; and an attractive map locating various roads, trails, visitor facilities, and refuge opportunities.

8. Hunting

Moose hunter check stations were conducted at Swanson River Road and Mystery Creek Road in September, as in previous years. Additionally, check stations were conducted three days at a new location along Skilak Lake Road. The check stations served a three-fold purpose of gathering

moose harvest data, preventative law enforcement by increased contact with hunters, and gathering general recreational use information.

Road Hunters

You don't have to get too far off the road when you a— animal as big as a moose!

The opening day of moose season at mile two on the Mystery Creek Road. (Staff Photo)

Following a trend, set from 1980 to 1981, fewer hunters checked through both stations during 1982.

Though there were fewer moose taken during the first twelve days of the 1982 season, the hunter success ratio was slightly increased at Swanson River and slightly decreased at Mystery Creek Road.

As in previous years, the majority of hunting parties were from the Kenai Peninsula. Table 21 shows that Kenai Peninsula residents took most of the moose through the check stations.

Table 21. Moose Check Station Results, 1982.

	Swanson River	Mystery Creek
Kenai Peninsula	62%	71%
Anchorage	25%	29%
Other	4%	0
Non-residents	9%	0

Most bulls taken from the two areas were yearling bulls (approximately 15-months old) (Table 22).

Table 22. Age of bulls taken from Swanson River and Mystery Creek, 1982

	Yearlings	Older Bulls	Unknown
Swanson River	60%	27%	13%
Mystery Creek	36%	64%	0%
Total	53%	32%	
Largest Bull:	Mystery Creek - 2 - 50 inches		

Traffic counters were also in place during the month of September . From September 1 to September 20, 3,407 cars utilized the Swanson River Road and Mystery Creek Road. Not all parties were involved in big game hunting, other hunters were involved in small game hunting or other wildland recreation pursuits.

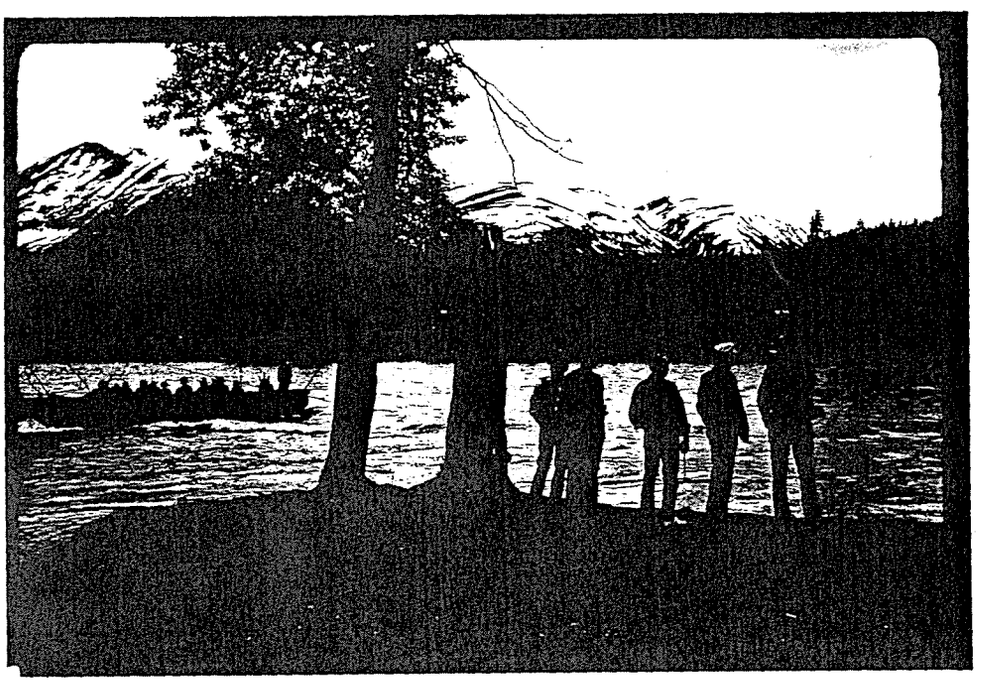
For the first time in several years, no observers were placed at alpine lakes during the first part of sheep season. Aircraft support logistics were the primary reason for discontinuing the observation-hunter contact program. The program will hopefully be continued in future years.

With the snowshoe hare population on the high cycle, small game hunting was quite popular during late winter of 1982. Generally, small game hunters are utilizing roadside areas along Skilak Loop Road, Swanson River Road, and the Sterling Highway.

Waterfowl hunting was poor during 1982, due to poor Alaska nesting conditions, migration patterns, and other unknown factors. The Mystery Creek Road remained open until October 20, for waterfowl hunters to gain access to the Chickaloon Flats. Though some hunters reported fair harvests of geese and ducks at Chickaloon, overall success was reduced from 1980 and 1981. Total hunter take is low even in the best of years, probably averaging less than 300 birds.

9. Fishing

Fishing activity takes place at several locations on Kenai NWR and within a wide range of management situations. According to a State-wide harvest report for 1981, which became available during 1982, Kenai Peninsula fresh water fisheries supported 338,528 man-days of effort. Including the Russian River, the Kenai River watershed provided approximately 16.8% of all the State-wide fishing effort. Other refuge fisheries provided significant portions of the total Alaska effort, Hidden Lake (.3%); Swan Lake and Swanson River Canoe Route lakes and rivers (.4%); and Russian River alone 1.7%. The survey estimates that 7.2% of all Kenai Peninsula fishing days take place on the Kenai NWR. Additionally, the majority of the total Kenai Peninsula fishing effort, (37% of the State-wide total) involves fish that spawn and/or reared on Kenai NWR.



Regional Office staff discuss fishing success with refuge visitors. (Staff Photo)

Russian River fishery, one of the most popular and concentrated fisheries in Alaska, occurs partially on Kenai NWR. The following tables illustrate 1963-82 use figures and vital statistics:

Table 23. Estimated sockeye salmon harvest, effort and success rates on Russian River, 1963-1982.

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
1963-82 Mean	11,140	11,961	21,598	29,487	0.177	

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

** Census was not conducted from 7/7/81 through 7/14/81, as sport fishing harvest during these dates was negligible. (Nelson, 1981)

Table 24. Differences between weekday and weekend day fishing pressure and rates of success at Russian River, 1964-1981.

	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
1964-1982 Mean	125.2	200.3	0.199	0.150	4.4	4.8

The Kenai-Russian River Access area managment program continued with few problems during 1982. Three park technicians were on duty during peak salmon runs.

Crowd management, litter control, information and interpretive signing and the U.S. Fee program continued with few problems. Increased management and higher profile law enforcement were initiated for 1981.

Entrance road traffic counters recorded 20,646 vehicles entering the Russian River facility with an average occupancy of 2.8 persons per vehicle, or 57,808 individuals. Many of these persons did not fish, but were attracted to the area for short sightseeing, people watching visits. Also, many non-fishing individuals were family members of fishermen. Several thousand persons received refuge and fisheries information. Total fishing effort both on and off refuge land at Russian River was 51,480.

Fishing effort in the upper Kenai River seemed to be significantly up from previous years. The Alaska Department of Fish and Game (in response to increased harvest in this area) initiated a seasonal closure to protect spawning rainbow trout. The Kenai River, from the Moose River confluence to Kenai (excluding Skilak Lake), was closed from April 29 to June 14.

Fishing for rainbows while floating the Kenai River is a popular refuge activity. (Staff Photo)

According to staff observations, as well as formal human use studies such as The Alaska Recreation Survey, fishing seems to be the single most influencial summer recreation activity at a majority of refuge

settings. Peak use in most refuge outdoor recreation activities is coordinated with peak salmon runs. Popular salmon fisheries draw many visitors to the refuge, who in turn, camp, hike, photograph, and boat.

Ice fishing is also a major refuge activity, although overall visits are relatively slight compared to summer fishing activity. Roadside and easily accessible lakes received the majority of ice fishing use.

10. Trapping

Trapping pressure and harvest have been monitored on the Kenai National Wildlife Refuge since 1956. Data indicate that trapping pressure has steadily increased, corresponding with increased human population and access opportunities. One hundred eighteen trapping permits were issued for the 1982-83 trapping season. Approximately 25% of the permittees utilize aircraft, 40% utilize snowmobiles, and 35% utilize non-motorized access methods. The intensity of trapping on the refuge appears unique in Alaska and is conducted primarily for recreation reasons. Trapping pressure appears to be independent of furbearer population levels, trapping success, or monetary return.

Increasing trapping pressure and the large number of inexperienced trappers, has resulted in user conflicts, limited impacts on non-target species, and negative impacts on wolf, lynx, and possibly beaver and otter populations.

The absence of detailed information on most of the refuge's other furbearer populations has made full assessment of trapping impacts difficult. Trapper education, user segregation, and shortened trapping seasons may be forthcoming to address the human and resource management problems resulting from intensive levels of recreational trapping on the refuge.

11. Wildlife Observation

Typical of many Federal and State land management areas, many refuge visits are multi-purpose in nature. Refuge visitors participate in a variety of activities during a single visit. Associated with many activities on the refuge is wildlife and wildland observation. Scenic driving occurs along the Sterling Highway, Skilak Lake Road, Hidden lake Road, Upper Skilak Campground Road, Lower Skilak campground road, Funny River Road and Tustumena Campground road. Though a significant amount of traffic volume is not wildlife related a majority of travelers enjoy and appreciate wildlife and wildland seen while traversing the refuge. Annual traffic volumes are as follows (Table 25).

Table 25. Annual Traffic Volumes and Daily Averages, 1981

Annual Traffic Volumes (1981)	Average Daily Traffic	Annual
Sterling Highway (Approx. Watson Lk)	1,350	492,750
Sterling Highway (2 Mi. west of Russian River)	1,800	657,000
Sterling Highway-L. Skilak Cmpgrnd.	120	43,800
L. Skilak-Upper Skilak	100	36,500
U. Skilak-Hidden Lk Road	100	36,500
Hidden Lk Rd-Junc. /Sterling H.	100	36,500
Hidden Lake Road	65	23,725
Lower Skilak Campground Road	50	18,250
Upper Skilak Campground Road	50	18,250
Swanson River (Refuge Boundary)	175	63,875
Ski Hill Road	35	12,775
Funny River Road	200	73,000
Tustumena Campground Road	65	23,725

Note: The above includes vehicles traveling both directions.

It is estimated that past monthly and annual use statistics have not appropriately considered Sterling Highway, refuge road, and associated incidental and short duration visits as actual refuge visits. Although Sterling Highway travelers, for example, certainly have no choice but to cross the refuge, many travelers in fact stop to observe wildlife or wildlands. Driving for pleasure in fact is listed as the number one southcentral Alaska outdoor recreation pursuit in the 1981 Alaska Public Recreation Survey. In fact, a minimum of 1,609,650 persons traveled the Sterling Highway across refuge lands during 1982. This figure is estimated by taking 2.8 individuals per vehicle times an average between the Watson Lake and Russian River counters. In any given situation, these persons could derive a benefit from observing wildlands or by observing a moose, furbearer, or wildlife species crossing the road. In compiling actual use estimates for Comprehensive Planning, an estimated 10-20 percent of these people actually participate in a refuge visit while traveling the Sterling Highway. The "lion's share" of these visits involve wildland or wildlife observation.

The Sterling Highway passing through the refuge near Jean Lake. (Staff Photo)

12. Other Wildlife/Wildland Oriented Recreation

A large portion of visitation on Kenai National Wildlife Refuge involves water-oriented or water related outdoor recreation activities. Many portions of the refuge are accessible only by floatplane, canoe, or power boat. Most campgrounds and/or access sites are associated with a river or lake.

Looks like we'd better look for another "Last Frontier"! BD

The Paddle Lake entrance to the Swanson River Canoe Route on July 4, 1982. (Staff Photo)

Several access sites and campgrounds have formal boat ramps, constructed of surplus aircraft landing mats. Several boat ramps are in need of repair and will become 1983 maintenance priorities.

A group of rafters take out at Upper Skilak Lake campground after floating the Kenai River. (Staff Photo)

Most southcentral Alaska recreation surveys show that water based activities are of high priority to Alaskans. Refuge management has acknowledged this high interest in water related activities, even during winter months, when waterways are used as routes to winter activities via walking, skiing, dog mushing, snowmobile, and ski plane use.

Riparian areas, lakes, and rivers are often the most important habitats for wildlife. Emphasis has been placed on mitigating, or avoiding, negative impacts of popular recreational use in these areas. Among other efforts, two refuge boats were acquired during 1982 and will facilitate increased public contact and law enforcement on lakes and rivers.

A review of popular aircraft landing lakes during 1982 set in motion regulations that will restrict use during swan nesting. An example of related efforts include an eagle nesting island which was posted "No Camping" on Gavia Lake within the wilderness canoe system.

Many refuge visitors combine berry picking with other refuge activities. (Staff Photo)

Because of the tremendous increase in motorboating, outgoing Governor Jay Hammond appointed a Task Force to study and hopefully resolve wildlife and fishing habitat, boater use, erosion, and social experience conflicts on the Kenai River. The Kenai River, the most popular boating and fishing river in the State, has experienced many overcrowding problems. Several portions of the Kenai River are within the refuge, and Refuge Manager Bob Delaney was named to the Task Force. Several public meetings were held during 1982, and topics proposed solutions to problems, included motorboat horsepower restrictions, fishing restrictions, speed limits, increased law enforcement and public safety efforts, float only areas, and segregation of user groups. The Kenai River Task Force's final report will be released in 1983.

Related to the Task Force report effots, but in separate refuge findings, several new or continued regulations were proposed to reduce impacts of recreational use. Generally, the proposed regulations are as follows:

--Restricting motorboat use during March 1 to May 1 to protect a traditional swan nesting and staging area at the outlet of Skilak Lake.

--Maintenance of 10-horsepower limit regulations on many lakes and rivers throughout the refuge.

--A float-only area on the upper Kenai River between the confluence of the Russian River and Kenai River and Skilak Lake.

--Complete prohibition of airboats and non-traditional water-related conveyances.

The Alaska Division of Parks also completed a master plan during 1982, addressing use and access on the Kenai River. Refuge staff provided input to parks' planners. The possibilities of a cooperative agreement, assigning management of refuge-held portions of the lower Kenai to State Parks was discussed and evaluated.

The Swan Lake and Swanson River canoe routes received approximately 14,000 visits during 1982. The canoe routes are within Kenai Wilderness and remain a very popular canoeing, camping, fishing, and wildlife observation area. A volunteer backcountry registration tag remained in effect during the year, as well as group size limitations. New regulations were proposed during 1982 that would make the backcountry registration and group size limitation mandatory.

Two volunteers were on duty patroling the canoe system during June, July, August, and September. Portage maintenance, public contact, trailhead information dispersal, visitor education concerning sensitive wildlife areas, and campsite data gathering were emphasized. It is the hope of refuge management to continue this popular wilderness canoeing opportunity while minimizing wildlife displacement or loss of the wilderness character of the area.

Two of our volunteers assisting visitors in the canoe system areas. (Staff Photo)

13. Camping

As reported in the 1981 annual narrative, the majority of refuge activities are supported by, and associated with, camping. Camping on Kenai NWR involves both developed facilities as well as back country related camping.

Emphasis continued during 1982 on upgrading and streamlining services at developed facilities that support camping. In support of improved camping, as well as minimizing impacts, all present facilities were evaluated for overall condition and ability to support increased capacity within a given site.

The apparent reason for providing developed campsites is visitor convenience and opportunity, but in fact the refuge views campgrounds as a way to confine and manage recreational impacts. Most research shows that the majority of impacts associated with a recreational visit occur in and around the campsite. Providing restrooms, safe drinking water, campsite pads, fire grates, garbage containers, public safety patrols, and refuge information are important components of wildlife and visitor protection. Efforts to improve all of the above continued during 1982.

The Russian River access area received high priority as did Hidden Lake and other developed facilities along Skilak Lake Road. Russian River received a new handicapped persons' viewing area and a restroom designed for wheel chair use. A new well was also drilled at the Russian River access site to replace a contaminated well. New guide signs, identifying developed facilities and milages to those facilities, were posted at either end of the Skilak Road.

Management of the Russian River facility went well, though as always, was a continuing drain of refuge manpower. Fees collected at the Russian River Fee Area amounted to $7,884. This compares with $5,613 during 1981. The additional collection is attributed to increased compliance efforts.

15. Off-road Vehicles

The only off-road vehicles authorized on Kenai NWR are snowmobiles in designated areas. The winter of 1982 produced fair snow conditions and the season closed on April 5, 1982. Snowmobiles are utilized to gain access for trapping, ice fishing, and other refuge activities. Areas of particularly high use include frozen waterways, seismic lines, and alpine areas of the Caribou Hills. Various options for future open and closed areas received extensive review during Kenai's comprehensive planning effort. Certain options could reduce areas, currently designated for snowmobile use.

The illegal use of 3-wheeled vehicles, with large balloon tires, has increased tremendously during 1982. Reasons for this include snow conditions which favor their use, less expensive than snowmobiles, and increased marketing. Several citations were issued to persons illegally using off-road vehicles.

Ice fishing, utilizing licensed vehicles to drive via frozen lakes to an ice fishing "hot spot", received discussion during 1982. Large numbers of people utilize Hidden and Engineer Lakes, although such use has been technically illegal. Regulations were proposed during 1982 which would legalize driving on Hidden, Engineer, Kelly and Peterson Lakes by highway licensed vehicles for ice fishing purposes. Ice fishermen would have to enter and exit the lake via the existing boat ramps. Other popular ice fishing lakes, such as Skilak, Dolly Varden, Rainbow, Lower Ohmer, and Watson, were not included for safety, wildlife, or visitor experience reasons.

17. Law Enforcement

Though there was no full time law enforcement officer on the staff of Kenai NWR during 1982, law enforcement efforts remained above the average of previous years. At year's end, 3 refuge employees had law enforcement commissions. At least one full time law enforcement person was on duty 7 days a week from May 1 to October 15, 1982.

Special Agent Wally Soroka also continued to contribute tremendously to refuge law enforcement efforts. Having a plain clothes person on patrol during busy times significantly increases the number of violators apprehended. Put your refuge officers in plain clothes if you want to. LRF

Cooperative efforts between State Fish and Wildlife Protection officers, Alaska State Troopers, and refuge officers is very good with each contributing to the goals of the other two agencies. Several State cases were initiated by refuge officers and conversely several refuge cases were initiated and reported by State officers.

In a recreation use report, finalized in 1982, the following was noted:

> Kenai Peninsula fisherman-days were estimated at 560,000 for 1980, and a State legislative report estimated a 15 percent violation occurrance among all sport fishermen. Fish and Wildlife Protection Officers approximated fishing violations on refuge lands at 100-125 per year over the previous five years. They also estimated a 17 percent contact rate with all sport fishermen.
>
> It is not known what the overall illegal use of wildlife is on the Peninsula; however, State officers have had fewer cases in recent years.
>
> Refuge personnel estimate that a significant number of illegal wildlife uses take place in any given year. Unresolved moose poachings are estimated at approximately 20-25 per year, much less than in previous years. Several illegally taken eagles were investigated during 1982, each of which has remained unresolved.
>
> Including 1982, the following table (Table 26) shows cases that have been made during the previous five years by refuge officers. Illegal recreational use of refuge lands is considered to be much higher than resolved cases would indicate. Illegal fish and snowmobile use, for example, would probably have to estimated in the thousands.

Table 26. Violations on the Kenai National Wildlife Refuge for years 1978, 1979, 1980, 1981, and 1982.

Violation	'78	'79	'80	'81	'82
Snagging of fish	--	--	--	27	24
Fishing in closed water	--	--	--	13	4
Overlimit of fish	--	--	--	3	3
Fishing without a license	6	3	6	12	4
Snowmobiling in prohibited area	1	1	0	0	4
Motor bike in prohibited area	0	1	0	0	0
Motor boat in prohibited area	1	1	0	0	0
Driving vehicle in prohibited area	16	3	11	7	10
Parking in No Parking Zone	0	21	15	19	13
Dropping objects from airplane	0	1	0	0	0
Landing aircraft in prohibited area	0	4	4	1	4
Shooting fireworks/selling	1	1	0	0	1
Illegal hunting	4	1	1	3	0
Littering	1	0	0	5	0
Illegal camp/boats/cabin	3	0	9	3	1
Unauthorized advertising	0	0	1	0	0
Illegal wood cutting	0	0	3	3	4
Speeding	0	0	0	1	0
Reckless operation of machine	0	0	0	1	0
Unattended fire	0	0	0	1	0
Interference with employee	0	0	0	1	0
Destruction of Gov't property	0	0	0	0	1
Failure to comply with refuge SUP	0	0	0	0	1
Totals	33	37	50	100	74

Note: Chart taken from Recreation Classification Report. 1982.

Areas of increased concern involved the illegal wood cutting, illegal use of off-road vehicles such as 3-wheelers, non-permitted commercial operations, and preventing construction of trespass cabins.

In support of violation prevention and public safety, several news releases were sent to radio stations and newspapers. The new refuge leaflet also contained detailed activity and regulation information designed to prevent inadvertent violations. Seasonal Park Technicians continued to contribute significantly to preventative L.E. efforts by patroling in uniform, answering questions, and reporting violations. Seasonal employees were given a comprehensive review of the refuge L.E. program and their role and authority concerning refuge violations. Topics covered included; refuge regulations, 50 CFR, search and rescue, emergency operations, and cooperation with other agencies.

Several new signs posting closed roads or areas were installed during 1982. Signs posted were in compliance with the refuge sign manual and refuge sign plan.

A draft of new special regulations governing public uses to supplement 50 CFR and the ANILCA interim regulations was completed. The special regulations addressed public use, recreation, and access on Kenai NWR. The draft was forwarded to the RO. Public hearings will be held sometime during the summer of 1983.

← still not done now (3/04) Arnett h. said there will be r special regs for Alas refuges... so refuge take another step bac word in protectio

Nuisance and social infractions within busy recreation areas are believed to make up a significant number of overall "violations" on Kenai NWR. Continued busy weekend patrols, and increased uniformed employee visibility are intended to address these problems which relate primarily to refuge visitor experiences.

The majority of cases during 1982 were initiated by complaints from members of the public. Many reported complaints during 1982 remained unresolved or resulted in warnings by refuge staff.

It is significant to note that, during comprehensive planning public meetings and Kenai River Task Force public meetings, almost all participants agreed that increased public safety patrols and law enforcement efforts were needed on the refuge and adjacent lands.

Refuge staff also assisted with several search and rescue and emergency operations.

A cabin management policy was received in July, 1982, and will be incorporated in refuge law enforcement efforts. The cabin policy interpets legal and administrative direction for cabins provided by ANILCA.

18. Cooperating Associations

Kenai Branch, Alaska Natural History Association - The year 1982 has been a year of stability for the Kenai Branch of the Alaska Natural History Association. Sales for 1982, totaling $859.35, were slightly down from the 1981 sales of $947.00. Visitation increased slightly at the refuge headquarters during 1982, although the hours of headquarters operation continue to be Monday through Friday.

At the end of the year, 23 publications and 8 visual aids were available at the Kenai Branch. Of the 23 publications, several were not being reordered, either because they were out of print, or were not selling well. This overall number of branch sales' items was generally constant throughout 1982.

Funds of $385.00 were budgeted to initiate a monthly film series at Kenai. This project was not initiated and the funds were released to another USFWS, ANHA Branch to help fund the publication of Guide to Alaska Seabirds.

Refuge visitors perusing publications offered for sale by the Alaska Natural History Association at the Visitor Center. (Staff Photo)

The sales display area has remained the same during 1982, but will change slightly after installation of new Visitor Center educational and informational displays scheduled for late October 1982. These professional displays, combined with anticipated increased visitation, should greatly expand ANHA sales in the future. No overall increases in sales items will be proposed for 1983, but if increased visitation associated with the completed visitor center displays occurs, expansion will occur in 1984.

19. Concessions

Although there are no concession contracts on Kenai NWR, the Kenai Russian River Ferry most nearly parallels such an operation. The Russian River Ferry operates under a year to year Special Use Permit (SUP), though the permit has been renewed since the beginning of operation without exception. The ferry transported 21,630 individuals during 1982 and collected $37,851.50 in fees. Cost of the SUP is $500.00.

Looks like these two got seasick TAP

Fishermen preparing to board the current powered Russian River ferry at the refuge's access area. (Staff Photo)

Several other organized or commercial operations take place under special use permit. Though a certain number of commercial operators do business without appropriate SUP's, all known operators are in compliance. Permits are issued for up to one year and expire on May 1. There seems to be a high degree of interest in outdoor recreation-related commercial operations, as well as conducting special events, such as the State Championship Sled Dog Race in February of each year. To respond in a consistent manner to each applicant, SUP's were standardized with alternative addendums depending on specific commercial activities. A copy of the permit is appended.

During 1982, 30 outdoor organized or commercial operations were under SUP, 6 permits for use of the canoe system, 8 permits for 26 fly-in tent camps, 7 permits for guiding on the Kenai River, and other boating operations, 1 permit for operation of the Russian River Ferry, 5 permits for guiding/outfitting, 2 for non-consumptive hiking, sightseeing or backcountry trips, and 1 for organized races or special events on refuge lands.

Due to a shortage of refuge manpower new special use permits were not issued May 1, 1982 to May 1983. A signed letter verifying liability insurance, compliance with all provisions of the previous year's permit, and interest in conducting business was used to extend the permit.

George Ripley, a Homer area marathon race enthusiast, requested a Special Use Permit to conduct an "Iditarod" style 120 mile off-trail race, complete with prize money, across the most remote portions of the refuge. Based on the proposal received, the request was denied for safety and liability reasons. After Congressional intervention, it was requested that we reexamine our denial and issue a permit if he could post bond and provide insurance coverage. The race, however, was later conducted without a special use permit, bonding, and/or insurance. Four out of ten participants completed the distance, and no citations were issued for illegally conducting a race. As a result of our SUP denial, commercial sponsors declined to support the event, thus making it a "race", only in the minds of the participants. Mr. Ripley vows to be back next year. and he was! Can't keep George down

I. EQUIPMENT AND FACILITIES

1. New Construction

During 1982, construction consisted of three major projects, completing a new maintenance shop and storage warehouse, a new residence, and a new bunk house. All three facilities were accomplished by contract and constructed adjacent to refuge headquarters. These projects were started in 1981 and finished in 1982.

In November, the refuge maintenance staff started moving tools and equipment from the old Kenai maintenance facility to our new 6,160 square foot maintenance and storage warehouse in Soldotna. It will probably take all the winter months to complete the change-over.

This new shop facility will provide the refuge with additional storage space and modern equipment to help maintain our fleet of 29 vehicles and heavy equipment. For the first time ever, we now have a hydraulic hoist to raise our vehicles when necessary.

The new residence and bunkhouse was completed in late October. Both of these facilities will enhance and provide better living conditions for our staff, summer students, and volunteer help.

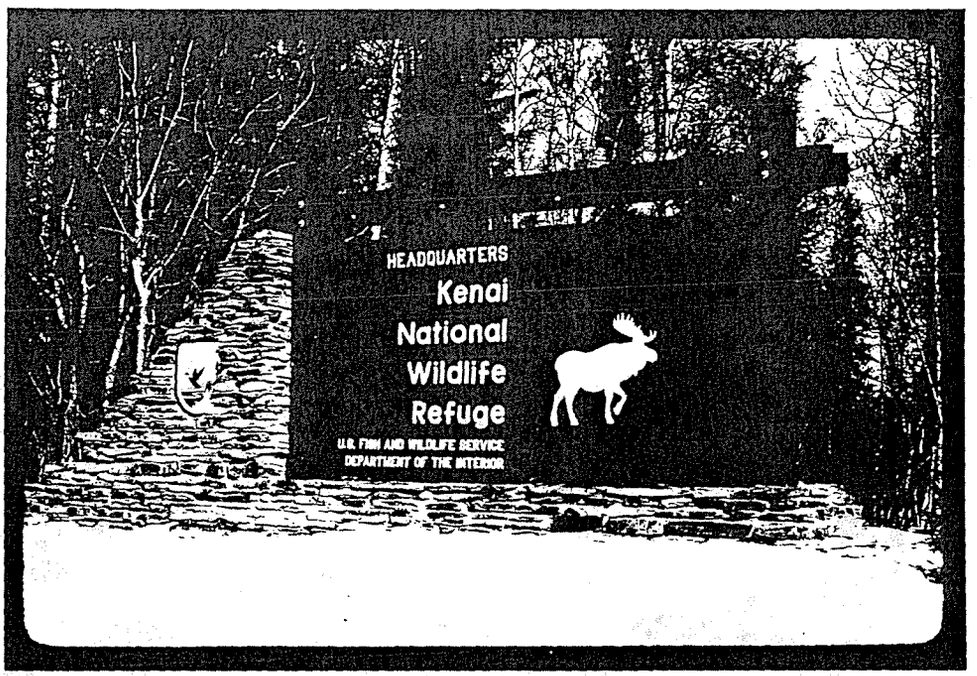
In addition to the major construction projects, our maintenance staff constructed a new restroom facility for the handicapped at our Russian River campgrounds and access area. This area has now been graveled and is the most popular access area/campground on the refuge.

A second handicapped facility at the Russian River Access Area was also completed. This construction included a concrete ramp for wheel chair access, starting at the parking lot edge, with conclusion at the river's edge. Hand rails and wooden benches to sit on not only proved to assist

the handicapped, but was also utilized by the elderly. Also a fence was completed which screens the access area from the adjacent private land. Contract costs on the Russian River Access Area totaled $52,709 in 1982.

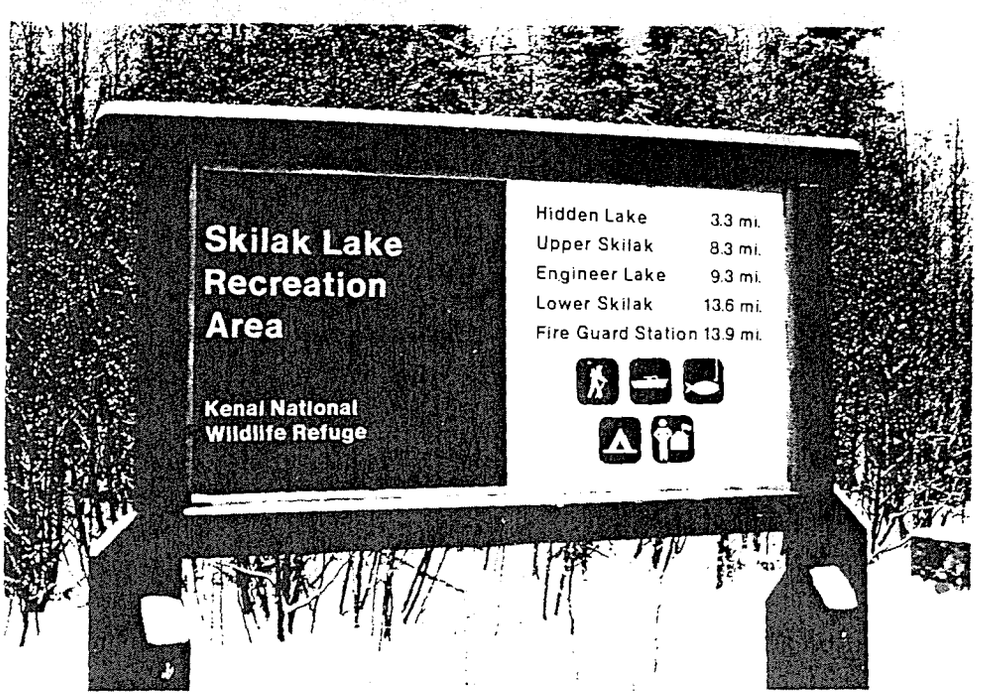
New fence constructed to screen the Russian River Access Area from adjacent private land. (Staff Photo)

The refuge maintenance staff got a late start on installing our 3 major entrance signs and 4 sub-entrance signs. However, all these signs have been installed, but only the Headquarters entrance sign has been totally completed. Evenutally, all existing refuge signs will be replaced with new wood routed signs. Cost of the signs purchased this year was $9,500.



Very nice! BW

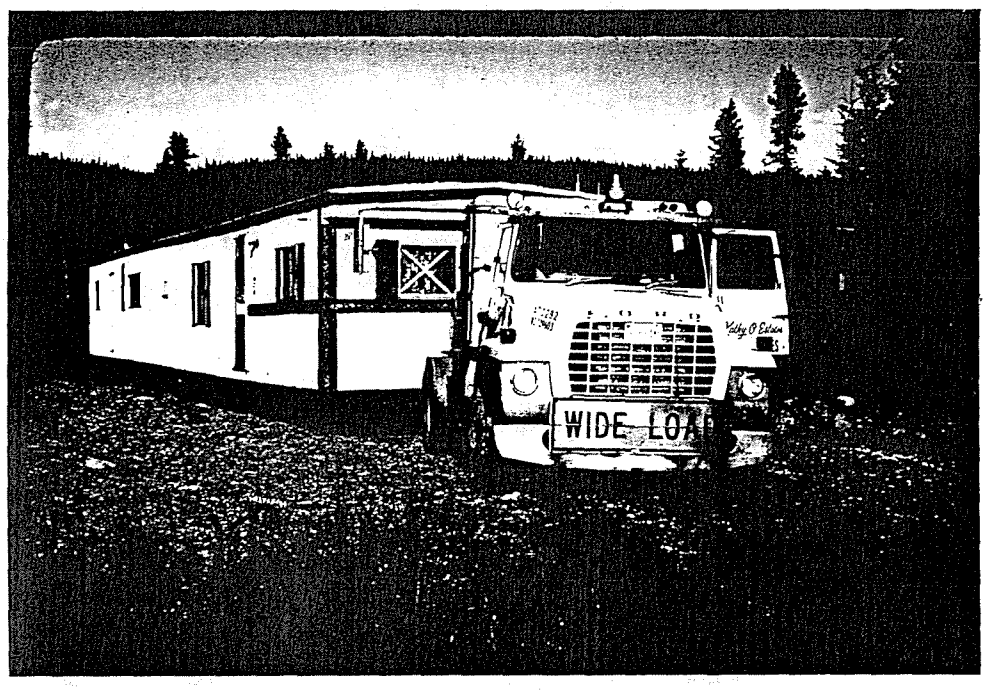
New refuge headquarters sign on Ski Hill Road. The sign frame, base, and adjacent landscaping was completed by the refuge maintenance staff. (Staff Photo)



New informational sign at the east entrance of the Skilak Loop Road. (Staff Photo)

Two new water wells were drilled by contract, one at Russian River Campground area and one at Schooner Bend spike camp.

The Schooner Bend bunkhouse facility is a joint project with the U.S. Forest Service, and consists of 4 large mobile homes for living quarters. It will be primarily utilized by seasonal employees of both agencies while working in the Russian River Area.

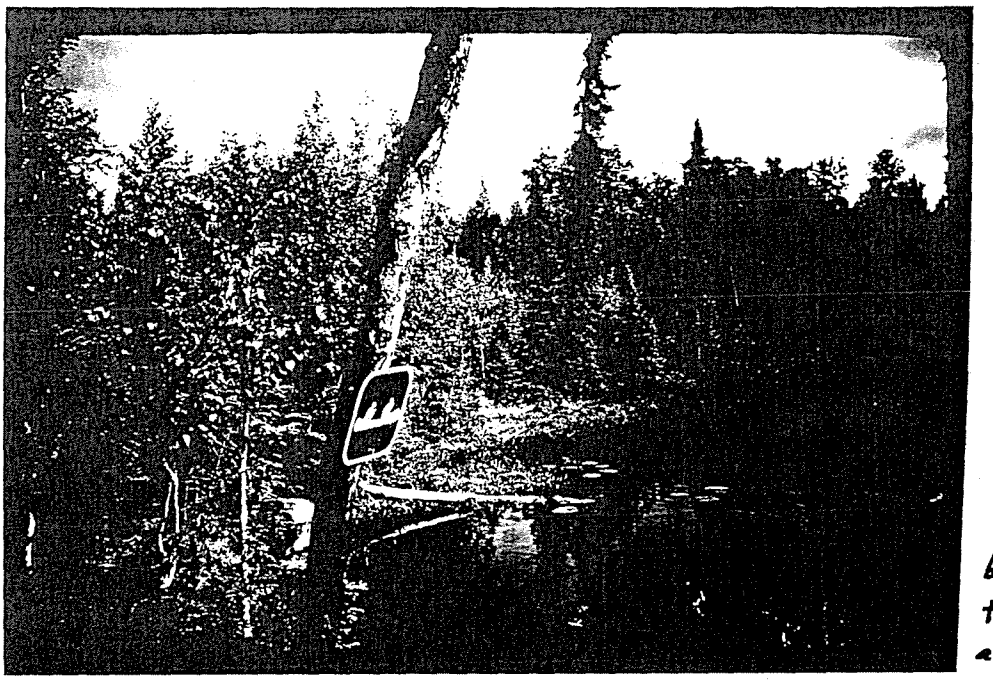


One of the mobile homes to be used as a bunkhouse at Schooner Bend. (Staff Photo)

2. Rehabilitation

Spring break-up produced the annual erosion problems in campgrounds and on roads. Bringing these facilities back to standard requires most of May and June every year.

Y.C.C. crews worked on the Swanson River Environmental Education Site, Hidden Creek Trail, Funny River Horse Trail, Swanson River Landing, and various canoe portages on the refuge. We would surely be further behind on these types of projects if it were not for all the work accomplished by Y.C.C. They do not always receive all the credit they deserve.



Judging by slough bark, I'd say the tree was dead, probably before sign was put up. LRF

Portage sign placed in the Swan Lake Canoe Route by YCC crews. (Staff Photo)

Further progress was made in bringing various refuge signs up to standards and into conformance with the approved refuge sign plan.

The Mystery Creek Road was graded to its connection with Alaska Pipeline right-of-way. The road has not received attention since 1978. In addition, refuge crews, utilizing a hydro-ax, removed encroaching brush on 25 miles of refuge roads.

3. Major Maintenance

The refuge's major maintenance emphasis was the annual struggle to keep in operation the refuge's vehicles and heavy equipment. The cost of military surplus equipment is right initially, but it sure turns into a maintenance problem. Significant time was also spent in 1982 on the continual replacement or placement of wooden posts or rock barriers in the attempt to keep 4-wheel drive, and other off-road vehicles, from intruding on the refuge.

There were no major maintenance on our facilities or structures.

4. Equipment Utilization and Replacement

With the hiring of 2 seasonal laborers, a new full time facilities-equipment mechanic, and our heavy equipment operator, we managed to increase maintenance on our fleet of 29 vehicles, 2 backhoes, 1 grader, 1 D-8 Cat dozer, 1 John Deere crawler, and 1 fork lift. With a little luck, by 1983, we will be back on a sensible maintenance schedule.

One new vehicle, a small, fuel efficient pickup was received in 1982, while three vehicles were placed on excess. A new grader is needed badly (has been for several years) and will hopefully be replaced in 1983.

6. Energy Conservation

Thanks to a volunteer program and an increase in maintenance-type positions, many neglected areas of maintenance received the attention they deserved this year as indicated elsewhere in this report. However, these increased activities were not without their price. For example, our energy conservation program turned out to be somewhat misnamed as our consumption of electricity, natural gas, and vehicle gas increased as indicated in Table 27 which follows:

Table 27. Energy use comparisons.

Product	Unit of Measure	Consumption FY81	Consumption FY82	Comparison/FY81 %Inc.	Comparison/FY81 %Dec.
Electricity	KWH	105,690	110,844	4.8	
Natural Gas	Cu. Ft.	1,529,700	1,762,900	15.2	
Vehicle Gas	Gallon	8,296	11,398	43.9	
Aviation Gas	Gallon	4,559	3,439		24.5
Propane	Gallon	736	668		9.2
Diesel Fuel	Gallon	880	316		64.0

Volunteer labor increased our summer work force by almost 50% this year. It is interesting to note that vehicle miles travelled increased 50.3% (42,870 miles) and gasoline consumption increased 43.9%, closely paralleling the summer labor increase.

In the near future, energy use at the old Kenai headquarters will decline markedly. The new shop, bunkhouse, and residence at the Ski Hill location near Soldotna (adjacent to our new office and interpretive center), are either ready or almost ready for occupancy. The old facility at Kenai will be disposed of, perhaps in FY 1983.

Many of the old buildings at the old headquarters-the shop in particular- were not energy efficient. Although the new headquarters boasts energy efficient, modern buildings, more energy will be required to operate the new facilities. The new office building is not only larger but includes a good-sized interpretive center complete with a 30-seat audio-visual room, the bunkhouse is larger, and the shop building is larger. Not only are they larger, but they are more adequately heated, they are better lighted, and there are 8 bathrooms compared to 3 in the buildings they replaced. All of these modern conveniences will add to the energy consumption load.

J. OTHER ITEMS

1. Cooperative Programs

The refuge supplies an aircraft and staff time to the Soil Conservation Service for reading snow course and aerial snow markers in the Upper Russian Lake drainage during winter months. The snow information will be used to measure winter severity and its impact on sheep, goat, and salmon resources.

All existing formal cooperative agreements effecting the refuge were reviewed, and comments were provided to the Regional Office Task Force assigned the task of updating and reviewing of existing agreements.

The refuge hosted several local meetings of the Kenai Peninsula Conservation Society by providing a meeting place at the Refuge Visitor Center and presenting updates to the Society on refuge programs.

The refuge cooperated with various ADF&G Divisions by providing personnel from our YACC program to assist in various technical and non-technical State programs.

The refuge works cooperatively with the local Court system by providing a work environment for a variety of non-harmful offenders. During the past year all of our janitorial work has been performed through this program.

2. Items of Interest

Leslie Blaylock, Accounting Technician, was converted from a career seasonal to a full time appointment during February.

ARM Vernon D. Berns transferred in February to Alaska Peninsula NWR to fill a new (ARM-Pilot) position. During Vern's tenure at Kenai, he contributed significantly to the wildlife and recreational programs.

Wayne Regelin of the Denver Research Center, stationed at Kenai, left the USFWS in February and went to work for ADF&G in Fairbanks, Alaska.

ARM Linda Gintoli resigned from the USFWS on May 24. She continues to live in the local community with her family.

Wildlife Biologist Ed Bangs was promoted to a GS-9 and converted from a career seasonal to a full time appointment during June.

The Facilities and Maintenance Mechanic position was filled by Ben Chio who arrived with his family on June 14.

The Primary Assistant Manager position was filled by Mike Hedrick who arrived at Kenai with his family on June 23.

The Supervisory Recreational Planner position was filled by Mike Boylan. He arrived at Kenai from the San Francisco Bay NWR on November 15.

3. Credits

Primary Assistant Refuge Manager Mike Hedrick initiated preparation of this report, made section assignments to other staff members, wrote the credit section, and edited the narrative. Refuge Manager Bob Delaney completed the highlights, climatic conditions, funding cooperative programs, and items of interest sections. Outdoor Recreational Planner Rick Johnston completed the youth programs, volunteer services, technical assistance, wilderness and special areas, and the entire public use portion of the document, with the exception of the hunting, fishing, and trapping sections. Assistant Refuge Manager/Pilot Bob Richey completed the land acquisition portion. Wildlife Biologist Ed Bangs completed the publications section, and colaborated with Fish and Wildlife Biologist Ted Bailey on the planning portion of the narrative. Ted Bailey completed the forests, hunting, and trapping sections. Jim Friedersdorff, Assistant Project Leader, Kenai Fisheries Station, and Bailey completed the fisheries section. Facilities and Maintenance Mechanic Ben Chio completed the safety, new construction, rehabilitation, major maintenance, and equipment utilization and replacement sections. Administrative Officer Gene Heath completed the energy conservation section, and Accounting Technician Leslie Blaylock wrote the personnel section. Last, but most important, Clerk-Typist Pat Fencl typed the draft, and Leslie Blaylock did the final compiling and correcting of this report.

L. APPENDIX

1. Publications

Recent Publications of the Kenai National Wildlife Refuge.

Bailey, T.N. 1978. Moose populations on the Kenai National Moose Range. Proc. 14th North Am. Moose Conf. & Workshop. 14:1-20.

Bailey, T.N. and E.E. Bangs. 1980. Moose calving areas and use on the Kenai National Moose Range, Alaska. Proc. N. Am. Moose Conf. 16:289-313.

Bailey, T.N., E.E. Bangs, and V.D. Berns. 1980. Back carrying of young by Trumpeter swans. Wilson Bulletin. 92(3):413.

Bailey, T.N. 1981. Factors influencing furbearer populations and harvest on the Kenai National Moose Range, Alaska. 1980 Worldwide Furbearer Conf. Proc. Vol 1:249-272.

Bailey, T.N. 1981. Characteristics, trapping techniques, and views of trappers on a wildlife refuge in Alaska. 1980 Worldwide Furbearer Conf. Proc. Vol II:1904-1918.

Bailey, T.N. and A.W. Franzmann. 1983. Mortality of resident versus introduced moose in a confined population. J. Wildl. Manage. (April 1983 Issue)

Bailey, T.N., A.W. Franzmann, P.D. Arneson, and J.L. Davis. 1983. An evaluation of visual location data from neck-collared moose. J. Wildl. Manage. 47(1):25-30. (April 1983 issue)

Bailey, T.N. and E.E. Bangs. 1982. Passerine bird use of early successional and old growth forest habitats on Kenai NWR. (Abstract only) Proc. Alaska Migratory Bird Conf., Anchorage, Alaska. March 15-18.

Bailey, T.N., E.E. Bangs, V.D. Berns, and R.A. Richey. 1982. Trumpeter swan numbers, habitats, and breeding success on Kenai National Wildlife Refuge (Abstract only) Proc. Alaska Migratory Bird Conf., Anchorage, Alaska. March 15-18.

Bangs, E.E. 1979. The effects of tree crushing on small mammal populations in Southcentral Alaska. M.S. Thesis, Univ. of Nevada, Reno. 80pg.

Bangs, E.E. 1980. History of wildlife on the Kenai National Moose Range. Three part newspaper feature published in the Outdoor section of the Kenai Peninsula Clarion, Kenai, Alaska. May 2, 9, 16.

Bangs, E.E. and T.N. Bailey. 1980. Interrelationships of weather, fire, and moose on the Kenai National Moose Range, Alaska. Proc. N. Am. Moose Conf. 16:255-274.

Bangs, E.E., V.D. Berns, and T.N. Bailey. 1981. Leech parasitism of Trumpeter swans in Alaska. Murrelet. 62(1):24-26.

Bangs, E.E. 1981. A modified museum special snap trap. J. Wildl. Manage. 45(4):1079.

Bangs, E.E., T.N. Bailey, and V.D. Berns. 1981. Ecology of nesting Bald Eagles on the Kenai National Wildlife Refuge, Alaska. Proc. Raptor Manage. and Biology in Alaska and Western Canada. (pp. 47-54)

Bangs, E.E. and T.N. Bailey. 1982. Human activity and Bald Eagles: Conflict on the Kenai Peninsula, Alaska. (Abstract only) Proc. Alaska Migratory Bird Conf., Anchorage, Alaska. March 15-18.

Bangs, E.E., T.H. Spraker, T.N. Bailey, and V.D. Berns. 1982. Effects on increased human populations of the wildlife resources of the Kenai Peninsula, Alaska. Trans. N. Amer. Wildl. and Nat. Res. Conf. 47:605-616.

Bangs, E.E., and T.N. Bailey. 1982. Moose movement and Distribution in response to winter seismological exploration on the Kenai National Wildlife Refuge, Alaska. Unpublished Final Report prepared for ARCO, Alaska Inc., Anchorage, Alaska. 46pp.

Fuller, T.K. 1981. Small mammal populations on the Kenai Peninsula, Alaska. N.W. Sci. 55(4):298-303.

Peterson, R.O. and J.D. Woolington. 1979. The extirpation and reappearance of wolves on the Kenai Peninsula, Alaska. Proc. Portland Wolf Symposium. (In press)

Peterson, R.O., T.N. Bailey, and J.D. Woolington. 1981. Wolf management and harvest patterns on the Kenai National Wildlife Refuge, Alaska. Proc. Edmonton Wolf Symposium. (In press)

Peterson, R.O., J.D. Woolington, and T.N. Bailey. Wolf-moose relationships on the Kenai Peninsula, Alaska. J. Wildl. Manage. (In review)

Smith, E.L. 1981. Effects of canoeing on Common Loon production and survival on the Kenai National Wildlife Refuge, Alaska. M.S. thesis, Colorado State University, Fort Collins, Colorado. 54pp.

United States Department of the Interior

IN REPLY REFER TO:

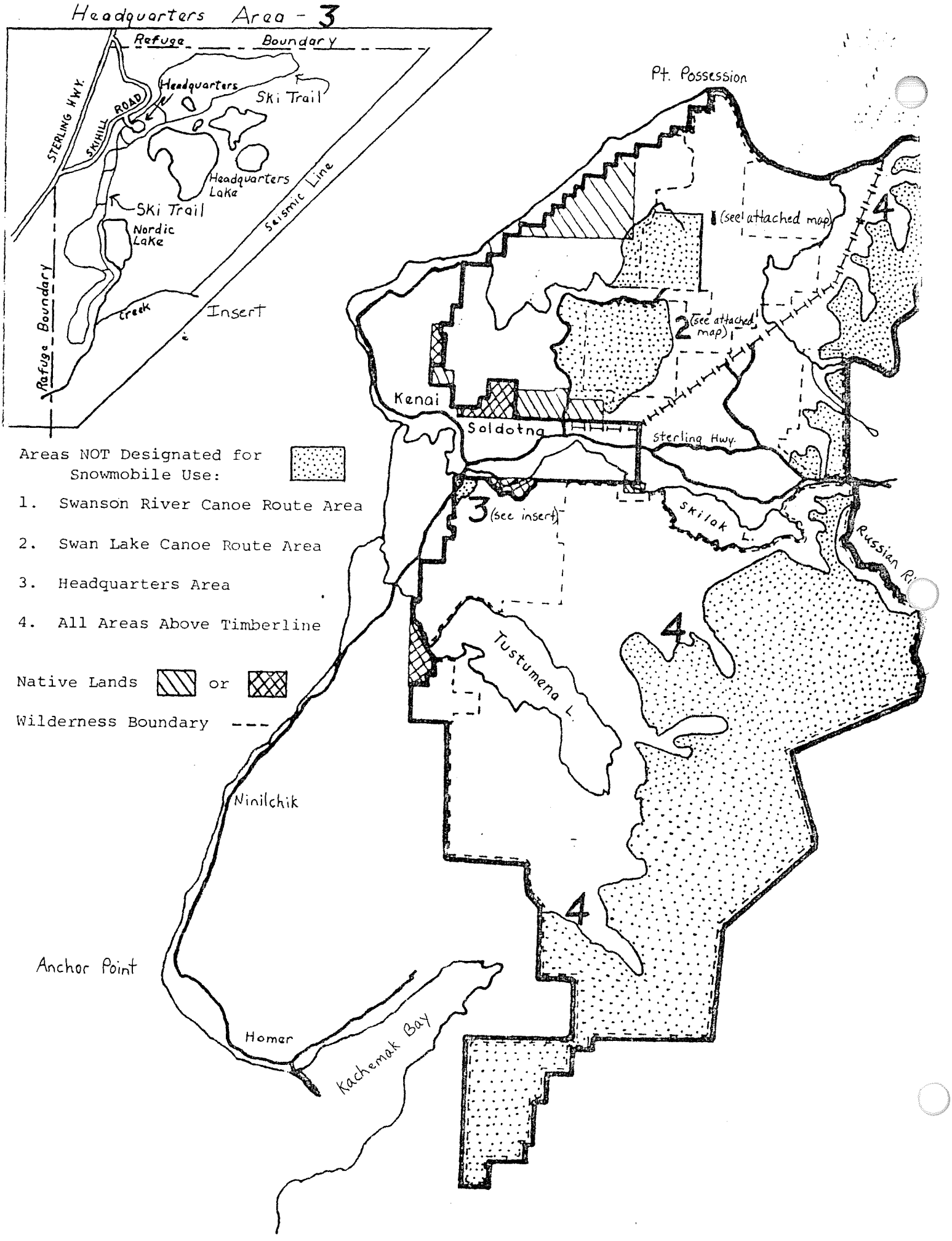
FISH AND WILDLIFE SERVICE
KENAI NATIONAL WILDLIFE REFUGE
P. O. BOX 2139
SOLDOTNA, ALASKA 99669-2139

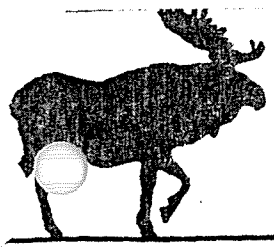
SNOWMOBILE REGULATIONS AND INFORMATION

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

1. Only snowmobiles with an overall width less than 40 inches and under 1000 pounds are permitted.
2. The use of snowmobiles may be authorized by the refuge manager between December 1 and April 30 only when snow depth is sufficient to protect the underlying vegetation and terrain along the route of travel and only after public notification.
3. The use of snowmobiles as an aid in big game hunting or for transporting big game animals, except fur animals, is not authorized.
4. The use of snowmobiles on maintained roads within the wildlife refuge is not authorized. Snowmobiles may only cross a maintained road after stopping and when traffic on the roadway allows safe snowmobile crossing.
5. The areas within T 4 N, R 10 W, Section 5, 6, 7, and 8 east of the Sterling Highway right-of-way, including Refuge Headquarters, the cross-country ski trails, Headquarters and Nordic Lakes, and that area north of the East Fork of Skilak Creek and northwest of a prominent existing seismic line to Funny River Road, is not a designated snowmobile area.
6. All areas above timberline, as designated on the attached maps, are not authorized for snowmobile use.
7. The use of snowmobiles for racing purposes, harassment of wildlife species, or non-wildlife-oriented activities is not authorized.
8. The area, including the Swanson River Canoe Route and portages, starting at the Paddle Lake parking area, west to the east bank of Swanson River, north along the river to Wild Lake Creek, east to the west shore of Shoepac Lake, south to the east shore of Antler Lake, and west to the beginning point near Paddle Lake, is closed to snowmobile use.
9. An area, including the Swan Lake Canoe Route, and several road-connected public recreational lakes, is not a designated snowmobile area. That area closed to such use is bounded on the west by the Swanson River Road, on the north of the Swan Lake Road, on the east from a point at the east end of Swan Lake Road, to the west bank of the Moose River, and on the south, by the north boundary of the Kenai Native Association lake boundary.
10. Refuge lands, conveyed to native groups under the Alaska Native Claims Settlement Act or Alaska National Interest Lands Conservation Act, are private lands and snowmobiling privileges must be obtained from the appropriate native group.
11. Authorized snowmobile use must be compatible with the purposes for which refuge lands were established, such as support for wildlife-oriented recreation activities of fishing and trapping. Any detrimental influence to wildlife habitat needs, distribution or abundance, resource values, or other authorized public use may require a review of such snowmobile use and new regulations proposed.
12. Please contact Refuge Headquarters, off Ski Hill Road, south of Soldotna, if additional information is required, or call the refuge office at 262-7021.

vember 1982


Headquarters Area - 3
Refuge Boundary
Sterling Hwy.
Skihill Road
Headquarters
Ski Trail
Headquarters Lake
Ski Trail
Nordic Lake
Seismic Line
Refuge Boundary
creek
Insert
Areas NOT Designated for Snowmobile Use:
1. Swanson River Canoe Route Area
2. Swan Lake Canoe Route Area
3. Headquarters Area
4. All Areas Above Timberline
Native Lands or
Wilderness Boundary
Pt. Possession
(see attached map)
4
2 (see attached map)
Kenai
Soldotna
Sterling Hwy.
3 (see insert)
Skilak L.
Russian R.
4
Tustumena L.
Ninilchik
4
Anchor Point
Homer
Kachemak Bay



kenai planning bulletin

KENAI NAT'L WILDLIFE REFUGE COMPREHENSIVE PLANNING PROJECT

U. S. Fish & Wildlife Service, 1011 E. Tudor Rd., Anchorage, Alaska 99503

Issue Number 5

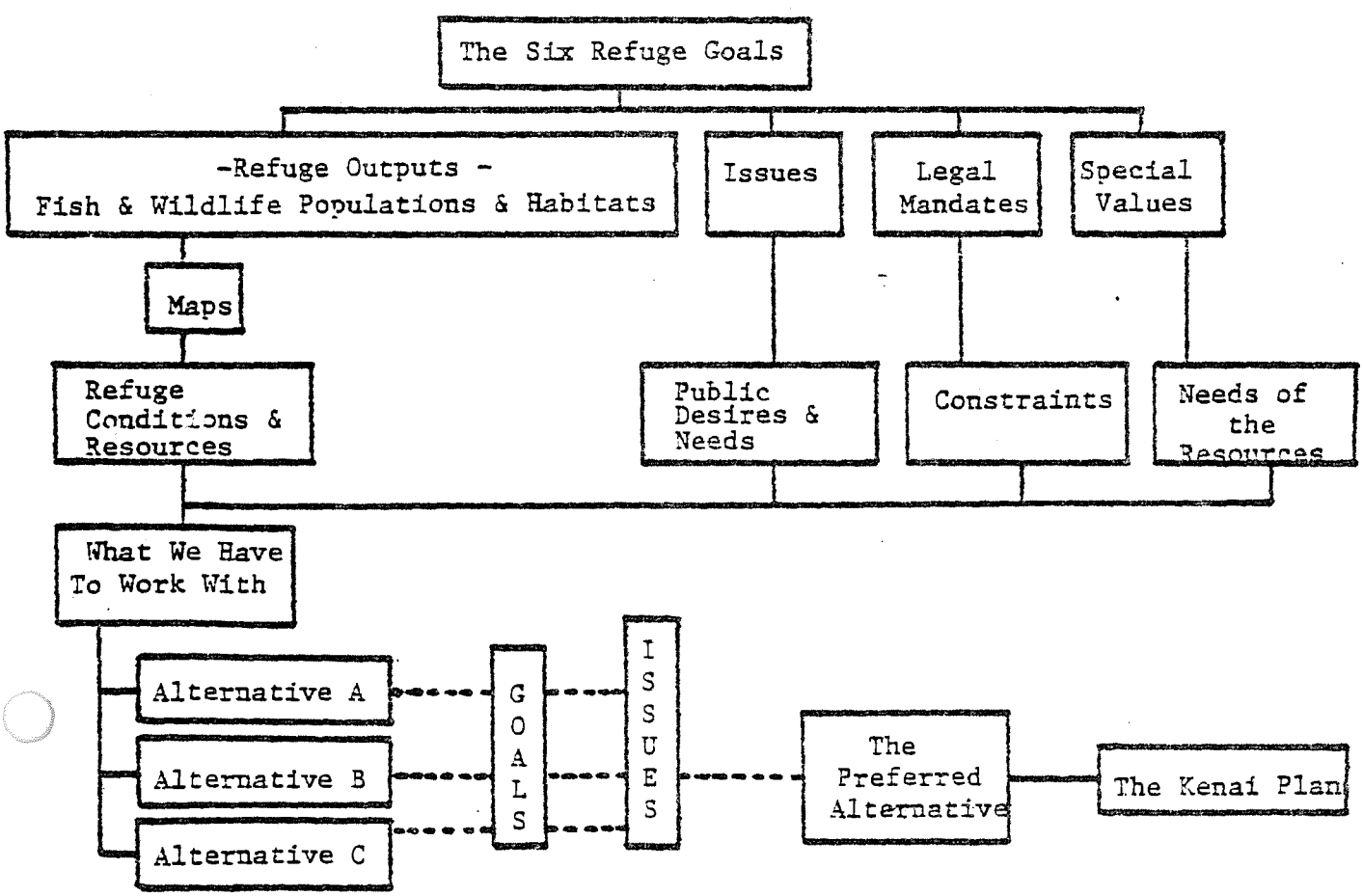
July 9, 1982

In previous editions of the Bulletin, we discussed the issues and concerns which the Kenai National Wildlife Refuge Comprehensive Conservation Plan will attempt to address. In this Bulletin we would like to offer a short progress report to let you know how the plan is being developed and what you can expect from the planning team in the coming months.

The Planning Process Described

For more than two years, we have been collecting data about the fisheries, wildlife, and recreation resources of the refuge. This information provides a basis for sound planning decisions on management of the refuge. In order to use the data effectively, it was necessary to develop the process we intend to follow to complete the plan. In other words, we developed a plan for planning. The steps in our planning process are as follows:

The Kenai NWR Planning Process



The driving forces behind the planning effort are the refuge goals adopted by the planning team. They represent the five purposes for which the refuge was established, as identified in the Alaska National Interest Lands Conservation Act (ANILCA), plus management of the wilderness areas created by the Act. The goals are:

* To conserve fish and wildlife populations and habitats in their natural diversity.

* To fulfill international treaty obligations.

* To ensure water quality and quantity.

* To provide opportunities for scientific research, land management training, etc.

* To protect and preserve natural conditions within the Kenai wilderness.

* To provide opportunities for fish and wildlife oriented recreation.

To determine how best to meet these goals, we first identified and described the fish, wildlife, habitats, and other resources of the refuge and the uses people were making of them. We also identified and mapped the "special values" of the refuge, important or unique resources and areas needing special protection. This inventory became the basis for assessing the potential of the refuge to meet the six goals. Through a series of public meetings and other contacts with people, we identified the pressing issues and concerns that the plan must address. We reviewed ANILCA and other legal mandates, and Fish and Wildlife Service policy to identify some of the constraints on management.

The inventory and assessment phases are now essentially complete and we are developing a series of land use alternatives, the management options from which the long-term plan will be selected.

Technical Specialists Consulted

One of the first tasks in developing the alternatives was to consult with resource specialists from outside the USFWS. We identified a number of individuals with particular expertise in the wildlife, fisheries, or recreation resources of the Kenai Peninsula and asked them to participate in a series of planning workshops in Soldotna in early June. Participants came from State, local, and Federal agencies, as well as private interests. At the workshops, the experts critically reviewed our inventory and, using their own experience and knowledge of the area and its resources, refined and added to it. They also identified various management options for resolving the problems they felt the comprehensive plan should address.

Five alternative solutions to specific problems were produced at the workshops. They dealt with issues relating to public access, moose production, fisheries enhancement, wilderness management, and public information. These five alternative solutions will provide a basis for a series of comprehensive alternatives now being developed by the planning team.

The completed plan must address a wide array of local, statewide, and national issues, including those discussed at the workshops and others identified in previous public comments. Each land use alternative developed must be evaluated for its effectiveness, both in resolving these issues and in attaining the six refuge goals.

Draft Plan To Be Completed, Reviewed

The alternatives will be ranked and a preferred one selected by the end of July to serve as a basis for the Kenai Plan. A draft of the plan will be completed by the end of August. Following extensive review within the Department of the Interior, the draft will be published and distributed for public review .. Distribution of the entire draft will be limited, but summaries will be made available to everyone on our mailing lists. Public meetings will be scheduled, in Anchorage and on the Kenai Peninsula, early next year, to provide opportunities for public questions and expressions of opinion. These meetings will be advertised in local newspapers, broadcast stations, the Kenai Planning Bulletin, and the Federal Register.

When the review has been completed and changes have beeen made in the draft where needed, the final version of the plan will be prepared for final adoption by the Secretary of the Interior. We intend to complete the final plan/EIS by July, 1983.

xxxxxxxxxx

Planning Schedule

In addition to requiring comprehensive conservation planning of all 16 refuges in Alaska, ANILCA also establishes a schedule for their completion. Five refuge plans are to be completed by December 1, 1983; five more by December 1, 1985, and the remaining six by December 1, 1987. To complete the plans on time and with the most efficient use of our manpower and other resources, we have prepared a schedule indicating some of the key dates for the planning efforts at each refuge. Because many of you have expressed interest in the planning for several refuges, we are including the following schedule:

Comprehensive Conservation Planning Schedule

National Wildlife Refuge	Intensive Planning Begins	Draft Plan Completed, Review Begins	Anticipated Adoption Date
Kenai	(In progress)	December 1982	July 1983
Alaska Peninsula	(In progress)	March 1983	November 1983
Becharof	(In progress)	March 1983	November 1983
Izembek	(In progress)	March 1983	November 1983
Togiak	(In progress)	March 1983	November 1983
Tetlin	October 1982	November 1983	July 1984
Yukon Flats	October 1982	April 1984	February 1985
Kodiak	January 1983	July 1984	April 1985
Kanuti	September 1983	December 1984	August 1985
Arctic	October 1983	March 1985	November 1985
Yukon Delta	February 1984	September 1985	May 1986
Nowitna	October 1984	April 1986	February 1987
Koyukuk	January 1985	June 1986	April 1987
Alaska Maritime	July 1985	October 1986	June 1987
Selawik	October 1985	January 1987	September 1987
Innoko	January 1986	March 1987	November 1987

At every refuge in Alaska, field data are already being collected for use in comprehensive planning. The dates for the beginning of intensive planning indicate the period during which the planners and refuge staffs will start to finalize the data and proceed through the steps of the planning process. As planning begins at each refuge, we also will be seeking comments from the public about the issues you think the plan should address.

Public meetings to solicit your comments will be held within the first months of intensive planning in communities most affected by each refuge. These meetings will be advertised in local news media and the Federal Register and by direct mail to interested citizens.

When each draft plan is completed, it will be reviewed by Fish and Wildlife Service staff members in Alaska and Washington, D.C. Following that internal review, we will publish and distribute the draft for review by the general public. Another round of public meetings will be held as part of that review. When the review is complete and changes have been made as needed, the plans will be submitted to the Secretary of the Interior for review and adoption. Copies of the adopted plan will be available for distribution to the public approximately 60 days after its adoption.

We look forward to your continued interest and participation in planning for national wildlife refuges in Alaska.