ANNUAL NARRATIVE REPORT
Calendar Year 1979

KENAI NATIONAL MOOSE RANGE
Kenai, Alaska

TUXEDNI NATIONAL WILDLIFE REFUGE
(TUXEDNI WILDERNESS)
Chisik Island, Cook Inlet, Alaska

UNITED STATES GOVERNMENT

memorandum

U. S. FISH AND WILDLIFE SERVICE

1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503
(907) 276-3800

TO: Refuge Supervisor

FROM: Assistant Area Director
Refuges and Wildlife Resources

DATE: August 25, 1980

SUBJECT: Kenai National Moose Range Annual Narrative Report

With considerable reservation I have signed the 1979 Annual Narrative Report for the Kenai National Moose Range. If it were not for the fact that a new Refuge Manager would be given the task of redoing a document that he had no input into, I would have recommended a redraft.

The report has a negative tone in numerous places and includes remarks not needed or desirable in this kind of document.

Please see that future reports from this station have a positive tone and include only materials appropriate to such a report.

KENAI NATIONAL MOOSE RANGE

Kenai, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1979

NATIONAL WILDLIFE REFUGE SYSTEM
Fish and Wildlife Service
U.S. DEPARTMENT OF THE INTERIOR

Review and Approvals

James E. Scott 8-1-80
Submitted by Date

Jan C. Rutherford 8/25/80
Area Office Date

JRC 8-19-80
KENAI NATIONAL MOOSE RANGE

Standing: Jakubas, Lewandoski, Fencl, Berns, Blaylock, Heath, Markel, Johnson, Richey, Kivi, Gintoli, Johnston.
Kneeling: Frates, Beard, Marrs, Woolington, Bailey, Degernes, Canaiy, Bartman-Stroud. Photo: Mary Ford 05/29/79

PERSONNEL

Permanent

1.	James E. Frates	Refuge Manager	GS-13	PFT	
2.	Robert A. Richey	Asst. RM, Oil & Gas	GS-11	PFT	
3.	Vernon D. Berns	Asst. RM, Enforcement	GS-11	PFT	
4.	Linda K. Gintoli	Asst. RM, Recreation	GS-11	PFT	
5.	Theodore N. Bailey	Wildlife Biologist	GS-11	PFT	
6.	Theodore "Al" Johnson	Forester	GS-11	PFT	
7.	Eugene P. Heath, Jr.	Admin. Officer	GS-09	PFT	
8.	Richard K. Johnston	Outdoor Rec. Planner	GS-09	PFT	
9.	James E. Lewandoski	Asst. Forester	GS-07	PCS	
10.	Leslie G. Blaylock	Admin. Clerk	GS-05	PCS	
11.	James D. Woolington	Bio. Technician	GS-05	PCS	
12.	Richard D. Kivi	Equipment Operator	WL-08	PFT	
13.	Richard "Bud" Beard	Mobile Equip. Mech.	WG-10	PFT	Tran:12/14/79
14.	Patricia A. Fencl	Clerk/Typist	GS-03	PPT	EOD:04/23/79

Temporary

15.	John Markel	Laborer	WG-03	TFT	EOD:05/07/79	
16.	Mary M. Nash	Janitoress	WG-01	TInt	EOD:08/20/79	
17.	Edward Bangs	Bio. Tech.	GS-05	TFT	EOD:06/04/79	Term:11/30/79
18.	Albert Marrs	Laborer	WG-03	TFT	EOD:04/23/79	Term:10/19/79
19.	Brian Canaiy	Laborer	WG-03	TFT	EOD:04/23/79	Term:10/19/79
20.	Chris Degernes	Park Tech.	GS-05	TFT	EOD:05/29/79	Term:10/19/79
21.	Donna B. Stroud	Park Tech.	GS-04	TFT	EOD:05/22/79	Term:10/26/79
22.	Jeff Gordon	Bio. Aid	GS-04	TFT	EOD:05/07/79	Term:12/19/79
23.	Loren Thomas	Laborer	WG-03	TInt	EOD:12/31/78	Term:05/03/79

YCC Staff (Camp of 20 enrollees)

24.	Peter Larsen	Camp Dir	GS-09	TFT	EOD:06/04/79	Term:08/07/79
25.	Von B. Phillips	Work Coord.	GS-07	TFT	EOD:06/04/79	Term:08/03/79
26.	Mindy Steiner	Group Leader	GS-05	TFT	EOD:06/04/79	Term:08/24/79
27.	Linda Bottfeld	Group Leader	GS-05	TFT	EOD:06/04/79	Term:08/14/79
28.	James Brickey	Group Leader	GS-05	TFT	EOD:06/04/79	Term:08/03/79

YACC Enrollees (No YACC Staff)

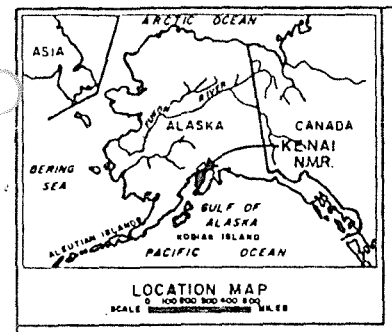
29.	Walter Jakubas	Enrollee Leader	TFT	EOD:03/05/79	
30.	Rebbeca Lashley	Enrollee	TFT	EOD:09/24/79	
31.	Pamela Bruhn	Enrollee	TFT	EOD:12/17/79	
32.	Kathie Correa	Enrollee	TFT	EOD:12/17/79	
33.	Brian Mahan	Enrollee	TFT	EOD:09/24/79	
34.	Ray Tibbetts	Enrollee	TFT	EOD:09/24/79	
35.	Dale Madsen	Enrollee	TFT	EOD:09/24/79	
36.	Ed Hamilton	Enrollee	TFT	EOD:09/25/79	

KENAI NATIONAL MOOSE RANGE

ALASKA

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



LOCATION MAP
SCALE 0 100 200 300 400 500 MILES

COMPILED IN THE DIVISION OF ENGINEERING
FROM SURVEYS BY U S G S & B S F & W

SEWARD MERIDIAN

TOWNSHIP DIAGRAM

MEAN DECLINATION

Scale 5 0 5 10 15 20 25 MILES

PORTLAND, OREGON

IR ALASKA 362 408

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I. GENERAL

A. Introduction

The Kenai National Moose Range is situated on the Kenai Peninsula in southcentral Alaska, just south of this State's greatest population center, the City of Anchorage. Although a scenic 112 mile drive through the Kenai Mountains is necessary to reach the Moose Range via road, the northern portion of this wildlife refuge is only 20 air miles from Alaska's largest city.

Located on the northwest portion of the Peninsula, the refuge encompasses about one-third of the Peninsula and is bounded by the waters of Cook Inlet to the west and Turnagain Arm to the north. The western extremity of the Kenai Mountains, generally along the 150 degree meridian, form the eastern refuge boundary, a common boundary with the neighboring Chugach National Forest from which the Moose Range was established December 16, 1941 under E.O. 8979.

This 1.73 million acre refuge, roughly 85 by 45 miles in area, was established for the purpose of protecting the natural breeding and feeding range of the Kenai moose which present a unique wildlife feature and an opportunity for the study in its natural environment of the practical management of a big game species.

B. Climatic and Habitat Conditions

The first month provided a "dukes mixture" of weather from clear days to overcast periods accompanied by freezing rain, snow, fog, gusty winds, back to clear days to repeat the sequence several times. Continued freezing temperatures from mid-December, however, helped to completely cover Tustumena Lake with a generous sheet of ice by January 8. During this period, the refuge lowlands experienced greater accumulative snow depths at any time since winter 1974-75, and effectively stalled most firewood and houselog seekers for the next several weeks.

Fantastic February provided clear days with mid-twenty temperatures dropping nightly to twenty below zero leading us to an early breakup and seas of mud the following month. By May 10, the ice had disappeared from most lowland lakes and deciduous plants leaved shortly thereafter. Just as suddenly, we found ourselves lacking precipitation, stream levels low, and accompanying fire hazard conditions prohibiting open fires. Until extended periods of rain arrived, nine wildfires were recorded through the third week of June.

An Indian summer mostly prevailed into early September until storm systems "shotgunned" through the region, dumping rain and more rain. Precipitation turned to snow by mid-October, but only at higher elevations did lakes freeze. Our first good lowland snow fell Thanksgiving Eve to accumulate six inches. Lower temperatures and frequent storm systems increased lowland snow depths 12-16 inches during persistant periods of zero temperatures. Surprisingly, the last day of the year brought the lowest recorded termperature, 27 degrees below zero.

Numerous observations within the 1969 burn area suggest annual increased use by wintering moose. Past years, sightings in this area indicate these animals move out of the burn by the end of the year, perhaps due to increased snow accumulation limiting available browse.

C. Land Acquisition

1. Fee Title

A fee title acquisition program is not active on this big game refuge.

2. Easements

Not applicable.

3. Alaska Native Claims Settlement Act (ANCSA)

a. Kenai Native Association, Inc.

Under 14 (h) (3) of the Act, this Kenai Native group will receive 18,775 acres of Moose Range lands. Certain refuge lands were selected by the group as early as 1975 and convenance should be realized in early 1980.

Received for comment was a December 21, 1979, BLM draft decision approving the selected surface estate of lands located within the Moose Range for possible conveyance to the Kenai Native Association.

Negotiations between the Kenai Native Association and Fish and Wildlife Service regarding a possible exchange of intersts in lands within the Moose Range continued through the period.

b. Cook Inlet Region, Inc. (CIRI)

Sixteen sections of Moose Range lands, to be conveyed to CIRI under P.L. 94-204, Terms and Conditions of Land

Consolidation and Management in the Cook Inlet Area, have yet to be conveyed. Both the surface and subsurface estates to those lands will be removed from the refuge.

Under the terms of P.L. 94-204, "Cook Inlet Land Exchange", CIRI will receive up to 9.58 townships of oil, gas, and coal subsurface estate within the Moose Range. In December, ARCO Oil and Gas Company, acting as contractor for CIRI, conducted a four mile experimental seismic program to establish field parameters to be used on a proposed 200 mile program to survey certain subsurface refuge lands associated with mineral interests conveyed to CIRI.

Under 14 (h) (1) of ANCSA, the Secretary may withdraw and convey to Regional Corporations, lands supporting existing cemetery sites and historical places. CIRI has identified two sites within the refuge, one at the Russian River, the other near the outlet of Hidden Creek. At the Russian River site, prehistorical and historical use of the area has been identified. Both sites will be protected from unauthorized finds or disturbance; but as yet, it is undetermined whether CIRI or the refuge will manage the area.

There are additional sites on the refuge yet to be selected under 14 (h) (1).

c. Tyonek Native Corporation

The Tyonek Corporation received interim conveyance April 6, 1979, to approximately 32,938 acres of surface estate within the refuge. These lands, located between Kenai and Point Possession along the northwest boundary, remain subject to possible land exchange negotiations between this Native group and the Fish and Wildlife Service.

d. Salamantof

Nothing to report.

e. Point Possession

Nothing to report.

D. System Status

1. Objectives

Like many refuges, Kenai continues operating under a set of

rather antiquated objectives. These will be updated and revised as part of the Master Planning effort during FY 80 and 81.

Convenance of native village and corporation lands under ANCSA is still far from being finalized, and continues to complicate the objective setting process. Pending wilderness designation, gas and oil exploration on extensive subsurface entitlement to the Cook Inlet Regional Corporation, the recent addition of 170,000 acres to the southern boundary under Sec. 204(e) of the Federal Land Policy and Management Act and continuous refinement of State-Federal roles in management responsibilities further complicate the issue.

With the fluid state of land status on the Kenai and yet unresolved management concerns with adjoining State, private, Borough, and Chugach National Forest lands, it appears meaningful objective setting will be a long and difficult process.

In the meantime, we continue to limp along, fostering the illegitimate child spawned from the shotgun-wedding between PPBE and PFMIS. what is the connection? L.C.

2. Funding

Table No. 1 displays Kenai's funding and manpower situation from FY 77 through FY 80. Historically, this station has had a funding level commensurate with operational responsibilities. The 1979 level of funding represented Kenai's largest budget, but also represented barely adequate base funding for an intensified level of responsibilities.

The doubling of base costs for maintaining the new headquarters facility (in addition to maintaining the old one) is an area of major concern. Like most capital investments, construction funds are easier to generate than dollars for maintenance. This "behind the power curve" profile will haunt us as we move into a time of even higher inflation and energy costs.

Table No. 1. Kenai National Moose Range Funds and Manpower Patterns - FY 1977 through 1980.

FISCAL YEAR	1977	1978	1979	1980
YACC Camp	N/A	N/A	N/A	1*
PFT Manpower	8	9	9	9
PPT Manpower	1		1	1
Career Seasonal	2	3	3	4
Temporary	7	4	6	5
Intermittent	3	3	1	2
YCC Staff	7	7	5	0
MB	33,000	43,000	61,000	71,000
MNMB	198,900	250,000	310,000	266,000
I&R	139,000	180,600	192,400	171,000
Exp. for Sales	31,800	32,000	32,000	37,000
I&R - Fee Area	N/A	N/A	11,750	7,500?
Const. & Rehab.			1,315,505	

*YACC Camp of 10 enrollees without a group leader from October 1979 through April 1980.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

On December 5, the refuge staff said goodbye to the quonset hut office at Kenai and moved to the new $1.3 million office just south of Soldotna. The old office had been the Fish and Wildlife landmark since 1948 and had weathered through many changes in management policies, as well as personnel. The original approval for the new headquarters started 18 years ago, when in 1962, the Portland FWS Engineers provided drawings and construction details. Those details, too, were subjected to so many changes that it can only be recorded as history when we look at the design of the new building.

The Sandland Construction Company of Anchorage received the successful bid in October of 1978. Some of the excavation and entrance road work was done during the winter and by late April, 1979, the footings were poured. From then on, the contractor stayed on schedule and had the building ready for inspection by late November as promised.

The refuge office started with a Quonset Hut in the 1940's with piecemeal additions through 1976, the building went through many changes, as have many of our refuge policies until December, 1979. Photo: Berns

The new Headquarters, with Visitor Center, at Soldotna Headquarters Lake, completed in November, 1979. It is big, spacious and comfortable but still hasn't acquired the "homey feeling" of the old office. Photo: Berns

As last year, the Young Adult Conservation Corps (YACC) prefabbed four 12 x 20 foot cabins at the headquarters and have begun construction of two of them at the Environmental Education Site located near the Swan Lake Road on the refuge. By the end of 1980, six cabins will be in place at the site for use by local school groups in their outdoor education efforts.

YACC crew building one of 6 new cabins at the EE Site. Can you pick out the safety hazards shown in the picture?
Photo: Johnston

A toll booth collection station was constructed at the refuge headquarters and transported by truck to the Russian River Campground in May. The booth is designed to provide maximum visibility and comfort for attendants and is heated by passive solar energy.

Setting up the new Fee Station at Russian River Parking Area.
Photo: Bartman-Stroud

B. Maintenance

During the spring preparation for the 1979 recreation season, several programs were initiated to manage Kenai's many roadside facilities. With so many facilities available, we decided to reduce services in certain areas, while increasing services in other, more popular areas. In general, we hoped to reduce the volume of daily garbage removal, reduce possibilities of wildlife-people conflicts, improve the appearance of several facilities, and free employees for other duties. In keeping with this goal, literally dozens of garbage cans were never installed during the spring of 1979. A "pack it home" program was initiated at many disposal areas thus freeing employees for higher priority areas. A dumpster contract was initiated at Tustumena, Russian River, Hidden Lake, and Jim's Landing visitor facilities. These campgrounds subsequently were maintained in a much improved condition. One visitor to Hidden Lake campground remarked that during Memorial Day weekend, the appearance of the campground was the best he had observed in 7 years. In short, we have concentrated solid waste management at high use areas and have tried to make other facilities self-managing.

Remote facilities have had much less litter and have taken less employee effort than in the past. In conjunction with this program, we established individual territories for each summer

employee. Employees were housed, if possible, near their work site, such as the three employees at Russian River. As was the case at Russian River, this successfully constituted fewer hours per day to be allowed for travel to and from work sites. Again, an increased number of seasonal employees, as well as a more efficient use of their time, showed significant improvements in services available to the public. Having more employee hours free from "throwing garbage cans" increased time spent in face to face public contact, compliance patrols, facility maintenance, and overall refuge employee visibility. We hope to continue along the same lines next year.

Maintenance programs for this year included placement of new fire rings in 11 campgrounds and some access areas. Old fire rings were replaced by new metal conduit rings. These fire rings were constructed and installed by Y.A.C.C. and refuge staff. Barrier posts, parking bumpers, and signs were also replaced in several campgrounds.

Though backcountry trails are in a much needed state of maintenance, several projects were completed including trail signing, trail brushing, and trail surface improvement. With the aid of Y.C.C., a significant amount of trail work was completed on the canoe system. Trails are an area of concern to the recreation staff, and trail planning as well as maintenance for the trail system will be an area of interest for the coming year.

During the fall, much needed maintenance of roads, culverts, and campgrounds continued using seasonal personnel as well as full time maintenance staff. The primary project for this fall, which is still underway, is replacing gaskets in all refuge wells. This project will be finished early next spring.

Improvements at Russian River are of the management by design philosophy and generally followed guidelines in the interim management plan for the area. They seem to confine impacts to the "hardened" areas and buffer areas were additionally protected. Overall appearance of the facility was much improved by completion of a log fence, visual barriers, and redesign of vehicular areas.

Placement of parking bumpers at Russian River helped control vehicle traffic, and protect vegetation. We hope to compile information from this previous summer and further improve design for 1980. Also a new restroom was constructed, alleviating frequent pumping of the present facility. A walk-in tent camping area was also provided and this area was quite successful, allowing tenters to obtain a much improved camping situation and also maintaining an option for users other then large motorhomes. We have received several positive comments concerning the tent

camping area. The walk-in tent camp area added to the "green space" around the parking area and protected that area from uncontrolled vehicle parking.

Other maintenance projects included rebuilding the old refuge road grader, trying to keep vehicles in operable condition, care of headquarters landscape, and replacement of some signs as needed.

C. Wildfire

The BLM responded to 9 fires on the Moose Range during 1979. Seven of these fires were less than an acre each. The other two were somewhat larger, but not in the proportions in which they have occurred in other parts of the State or what we have had here in the past.

Fire #7603 (cabin fire) was detected by private aircraft May 12, burning 5 acres just north of Lake Emma. Ten days, 55 men, and 125 acres later, the fire was declared out. Vegetation consumed was grass, white spruce, alder, aspen, and birch. No real damage occurred either by the fire or the suppression action. Our major concern was for Joe Secora's cabin on Lake Emma. Investigation of this fire revealed it probably was started by bear hunters using a warming fire or discarded cigarette. No arrests were made.

On June 11, fire #7651 (Wayne fire) was started by either careless use of fireworks or a discarded cigarette. The potential of this fire was great, due to the extreme weather and fuel conditions, 15 mph winds, gusts to 20, 25% R.H., 72°, dead fuel from a 30 year old burn. Recognizing the potential, the BLM put 127 men on the fire by June 12. Nine thousand four hundred gallons of retardant were dropped from 2 different aircraft during the first two days of the fire. By June 13, the weather had a favorable change and the fire was contained. Without this change of weather, the fire could have grown to project proportions.

The State of Alaska had a fire during this same period of extreme weather, to the west of the Wayne fire, near Brown Lake. Their policy permits then to use cat lines for fire control where our policy is to use cat lines only when life or private property are threatened. The fire on the Moose Range was 65 acres. The State fire reached about 150 acres, leaving unsightly fire scars.

It should also be noted that both fires #7603 and #7651 could have been allowed to burn if a fire management plan had been written. This was not the case, so both fires were attacked under our old policy. We are in the process of developing a fire management plan so this will not happen in future years.

III. HABITAT MANAGEMENT

A. Croplands

Not applicable.

B. Grasslands

Not applicable.

C. Wetlands

The National Wetland Inventory project has classified all wetlands on the Kenai Peninsula, including the Moose Range. To do this, they used high level photography from the RB-57 flights. At present, we are not using this inventory information but we will in the future.

D. Forestlands

1. Timber

During 1979, 88 acres were clearcut on 6 different small timber sales. Volume removed was 196 thousand board feet (MBF) of spruce, birch, aspen, and cottonwood, with $3,391 collected.

During the year, 11 sales were enforced, with 5 of these sales cancelled due to nonactivity.

The following table summarizes timber sale activity for the past 5 years:

Year	Volume removed	Dollars collected	Acres treated
1975	5 MBF	$ 792.50	2
1976	192	1,535.00	40
1977	79	1,768.00	16
1978	83	972.00	25
1979	196	3,391.14	88
	555 MBF	$8,458.64	171 ac.

Local markets for firewood and houselogs were good this year, and demand for Moose Range timber is steadily increasing.

These small openings in the mature forest contribute to the habitat diversity required to maintain the wildlife diversity unique to the Moose Range.

2. Free Use

In 1979, 390 free use permits were issued to the public for removal of timber products. This year, 5 acres located around the Moose Range were open for cutting of firewood, posts, poles, and houselogs.

The following table summarizes free use activity for the past 4 years:

Year	Permits Issued	# Areas Open
1976	194	2
1977	204	2
1978	411	5
1979	390	5

Demand is expected to remain high in the future as the price of non-renewable resources continue to rise.

These free-use areas not only give people a well earned outdoor experience, but also contributes to habitat diversity of the area.

E. Other Habitat

Since the moratorium on the use of tree crushers, no habitat has been managed other than the small areas mentioned in the Forestlands section.

F. Wilderness and Special Areas

To our knowledge, there has been no change in the wilderness area proposals or of the natural areas designated in 1952 and 1957. We do, however, hear rumors of the inclusion or exclusion of some of the smaller areas, depending on the political atmosphere.

G. Easements for Waterfowl Management

Nothing to report.

IV. WILDLIFE

A. Endangered and Threatened Species

Not applicable. There are no known resident populations of endangered or threatened species of wildlife on the Kenai National Moose Range.

B. Migratory Birds

1. Waterfowl

a. Ducks. A limited survey by canoe of 10 lakes in the Swanson River and Swan Lake Canoe Routes was conducted by a Canoe System Patrolman, from July 13-17, 1979. Scaup were the most frequently observed waterfowl species, followed by common mergansers and surf scooters. Although the average scaup brood size was 9, brood information was not obtained for other waterfowl species.

b. Geese. Snow geese were recorded on the Kenai River Flats from April 15 through April 24. Seven neckbanded snow geese were observed during this period (Table 1). Snow geese nest and were banded on Wrangell Island, Siberia, and winter in the Pacific Northwest. Lesser numbers of white-fronted and Canada geese were observed on the Kenai River Flats during the April 15-24 period.

Table 1. Snow geese on the Kenai River Delta*

Date	No.Ad.	No.IMM	Total	Percent IMM.
4/21	698	216	914	23.6
4/22	759	280	1,039	26.9
Total	1,457	496	1,953	25.4

Family Group Size	Collar # Seen
Ave.-2.26 yg/family Sample=58 families	PK-85 PE-75 PC-25 PC-56 PY-90 PR-02 PT-04

*Dan Timm, Waterfowl Coordinator, Game Division, ADF&G, Anchorage, Alaska

Fall aerial observations of the Chickaloon River Flats revealed moderate concentrations of Canada geese, as well as mallards and pintails. Waterfowl appeared to move through the Kenai area a little earlier in the year than usual and did not concentrate in large flocks as in the fall of 1978.

From mid-April to early May, thousands of snow geese stop at the Kenai Flats to feed and rest before winging on to Northern Alaska and the Russian Wrangel Islands to nest.
Photo: Bailey

c. Trumpeter swans. One nesting and two brood surveys of Trumpeter swans were conducted on the refuge. A nesting survey on May 30, revealed at least 29 nesting pairs of swans. Five aerially-counted clutches had an average of 5.2 eggs per clutch and early-brood counts from June 18-23 accounted for 19 early broods of 53 cygnets averaging 2.8 cygnets per early brood. A late brood count on September 28 accounted for 10 broods of 26 cygnets (2.6 cygnets per late brood).

A total of 14 cygnets from 5 broods were banded this summer, (Table 2). One adult was rebanded July 27, when she was molting, the male was able to fly and could not be captured. Two cygnets were captured and examined at this time, but were too small to band.

An adult Trumpeter swan (second from right) was banded at Kenai in 1978. Photo: Bailey

Table 2. Swan Banding, 1979

Location	Date	Sex	Neck Band #	Leg Band #
Two Island Lk.	7/27/79	F (Adult)	00VT	619-00900
Camp Island Lk.	8/14/79	F	99VT	619-00899
	8/14/79	F	01UR	619-01152
	8/14/79	F	02UR	619-01151
	8/14/79	F	03UR	619-01153
Gray Cliff Lk.	8/28/79	M	04UR	619-01154
	8/28/79	F	05UR	619-01155
Phalarope Lk.	8/30/79	M	06UR	619-01156
	8/30/79	M	07UR	619-01157
Diamond Lk.	8/30/79	M	08UR	619-01158
	8/30/79	F	09UR	619-01159
	8/30/79	M	10UR	619-01160
	8/30/79	M	11UR	619-01161
Dipper Lk.	8/30/79	F	12UR	619-01162
	8/30/79	M	13UR	619-01163

A leech-infested cygnet at Pollard's Lake was examined on August 13. Although it was in poor condition and died a few hours after being examined, the cause of death is unknown.

2. Marsh and Water Birds. Ten lakes were surveyed by canoe in the Canoe System in July, 1979. Common loons were the most frequently observed water birds (100% occurrence), followed by red-necked grebes (10% occurrence).

The Common Loon can be seen or heard on most of the lowland lakes at Kenai. Photo: Bangs

3. Shorebirds, Gulls, Terns, and Allied Species. On the July canoe survey, Arctic Terns were the most commonly observed bird in this classification with an average of 4.4 terns observed per lake. Northern phalaropes, common snipe, greater yellowlegs, Mew Gulls, and unidentified sandpipers were also seen during the survey.

4. Raptors. A bald eagle survey was flown this past summer to estimate bald eagle density and productivity. Twenty-seven active (eagles seen near or on nests) and seven inactive nests were located. Twenty-one eaglets were recorded in 15 nests during survey flights in late July-August (Table 3) for an average of 0.8 eaglets per early nesting pair.

Table 3. Eagle Survey Summary, 1979.

Nest Name	# Eaglets
Afonasi Lake	1
Bear Creek	0
Beaver Lake	-
Big Indian Creek	1
Bradley River	2
Campfire Lake	0
Camp Island Lake	1
Campers Lake	-
Clearwater Slough	1
Fox River	1
Gene Lake	1
Kenai River (Mi. 15-16)	0
Kenai River (Mi. 72-73)	2
Kenai River (Mi. 70-72)	3
Killey River (Lower)	1
Killey River (Upper)	1
Clam-Loon Lake	0
Mink Creek Lake	1
Moose Creek	0
Moose River	0
Moose River (W. Fork)	2
Russian River	-
Sheep Creek	1
Skilak Lake	-
Stormy Lake	-
Sucker Lake	-
Swan Lake	2-3
	21

The cliff area around Green Lake was examined in July to observe sheep winter range and search for falcon and eagle nests. A falcon nest was suspected of being in the area because one adult falcon was seen on several occasions. The adult was either a Peregrine or Gyrfalcon. An immature golden eagle was also seen in the area. A more detailed survey is planned for the area next summer.

5. Other Migratory Birds. Surveys were conducted during June to obtain base line data on the composition, diversity, and species abundance of bird communities in two successional stages of birch-dominated vegetation types. This survey had two objectives: 1) to test and familiarize refuge personnel with the spot mapping techniques of censusing passerine birds; and 2) to obtain information on the species composition of

bird communities and relate this to habitat type. Surveys were conducted in a ten year old birch site, Sunken Island Lake (Table 4) and a mature birch-spruce forest near Headquarters Lake (Table 5).

Table 4. Sunken Island Lake - 1969 Burn

Species	# Observations	% Total
Alder flycatcher	6	1.5
Arctic tern	1	0.2
Rusty Blackbird	3	0.8
Black-capped chickadee	5	1.3
Bonaparte's gull	1	0.2
Gray jay	24	6.2
Mallard duck	1	0.2
Northern three-toed woodpecker	1	0.2
Orange-crowned warbler	1	0.2
American Robin	8	2.1
Red shafted flicker	1	0.2
Common snipe	3	0.8
Song sparrow*	34	8.8
Dark-eyed junco*	36	9.3
Savannah sparrow*	7	1.8
Tree swallow*	16	4.1
Varied thrush	2	0.5
White-crowned sparrow*	198	51.0
Yellowlegs	36	9.3
Yellow-rumped warbler	3	0.8
Yellow warbler	1	0.2
	385	

Species diversity = 1.795 = Hs

Average number of birds -	seen	3/7 min/bird
-	heard (only)	87.4 min/bird
	Total	3.15 min/bird

Total species - 21
7 Visits - 5 complete, 2 incomplete
*Probably breeding in plot (5 species)
Total count time - 1,191 min.

Table 5. Headquarters Lake - Unburned

Species	# Observations	% Total
Rusty Blackbird	2	0.2
Boreal chickadee*	8	1.5
Black-capped chickadee*	21	3.9
Blackpoll warbler*	51	9.5
Great Horned owl	1	0.1
Gray jay*	10	1.8
Northern three-toed woodpecker*	5	0.9
Olive-sided flycatcher	1	0.1
American Robin	1	0.1
Ruby-crowned kinglet	1	0.1
Dark-eyed junco*	118	21.9
Swainson's thrush*	108	20.0
Tree swallow	13	2.4
Yellow-rumped warbler*	199	36.9
	539	

Species diversity = 2.408 = Hs

Average number of birds -	seen	5.9 min/bird
-	heard (only)	5.1 min/bird
	Total	2.71 min/bird

Total species - 14
8 Visits - 5 complete, 3 incomplete
*Probably breeding in plot (8 species)
Total count time - 1,386 min.

C. Mammals and Non-migratory Birds and Others

1. Game Mammals

a. Moose. The winter of 1978-79 appeared to be a moderately severe winter, in terms of moose survival. For the first time since 1975, the moose density counts were completed. The population estimate appeared to have remained near the 3,400 moose (3394 ± 878) estimated in 1975 (Table 6). Approximately 18% of the moose counted were calves.

Table 6. Observed and estimated numbers of moose north of Tustumena Lake, February 15-21, 1979.

Area			Moose			
Stratum	Size (mi^2)	Sample (mi^2)	Observed Numbers	Percent Calves	Average Density	Estimated Numbers
High	76	12	157	17.8	13.08	994.3
Med	557	80	194	19.1	2.43	1350.7
Low	1270	23	19	10.5	0.83	1049.0
Total	1903	115	370	18.1	1.78	3394.0

Moose calf counts during May-June on the Moose River Flats were not successful because of few moose observed on the Flats. Approximately 31 calves per 100 cows were observed but the sample size was small (N=28).

Fall composition counts in GMU 15A, by refuge staff, were conducted only in the 1969 burn area (Tables 7 and 8). In GMU 15(B)E, composition counts were conducted by ADF&G staff. Calf-cow ratios were 49:100 in the 1969 burn area (N=348) and 17:100 in the 15(B)E area (N=7). Bull:cow ratios in the same units were 51:100 and 25:100 respectively. Moose productivity and survival appeared to be best in the 1969 burn and worst in the 15(B)E mature spruce forest and benchlands, the same pattern as last year.

Table 7. Composition of Moose Population in 1969 Burn-1979

Moose	12/20/79	12/21/79	Total
Bulls			
+45"	7	4	11
-45"	10	31	41
Yrl	11	20	31
Total	28	55	83[1]
Cows			
w/o	40	53	93
w/1	28	32	60
w/2	4	5	9
Total	72	90	162
Total Adults	100	145	245
Lone Calves	1	0	1
Total Calves	37	42	79
Unid. Moose	14	10	24
Total Observed	151	197	348
Count Time	1.9	2.1	4.0
Moose/Hr.	79.5	92.3	87.0
Pilot	V. Lofstedt	C. Lofstedt	----
Observer	T. Bailey	T. Bailey	----

[1] Includes 7 bulls with shed antlers, all other bulls with antlers.

Table 8. Summary of Moose Observed in 1969 Burn, Dec. 1979

Bulls:100 Cows	= 8300/162 = 51.2:100			
Calves:100 Cows	= 7800/162 = 48.7:100			
% Calves in herd	= 79/348 = 22.7%			
% Cows without Calves	= 93/162 = 57.4%			
Twinning Rate	= 9/69 = 13.0%			
Small bulls:100 large bulls	= 3100/52 = 59.6:100			
Small bulls:100 cows	= 3100/162 = 19.1:100			
% Small bulls in herd	= 31/348 = 8.9%			

Percent Composition:

+45" Bulls	=	3.2%		
-45" Bulls	=	11.8%	23.9%	
Yrl Bulls	=	8.9%		70.4% Adults
Cow w/o	=	26.7%		
Cow w/1	=	17.2%	46.5%	
Cow w/2	=	2.6%		
Calves	=	22.7%	22.7%	Calves
Unident. Moose	=	6.9%	6.9%	Unidentified

Concentrations of moose were seen in November and December along the eastern edge of the 1969 burn and in the Skilak Loop area.

Cow moose and her calf in the Willow Lake area.
Photo: Bailey

b. Dall's Sheep. Aerial counts of sheep on the Range suggest the sheep population is still low compared to levels during the late 1960's (Table 9). A total of 12.2 hours were flown by ADF&G employees in conducting this survey. The refuge staff did not census sheep in 1979, because of bad weather and other commitments. Five hundred fifty-one sheep were observed, 340 ewes, 77 lambs, and 134 rams. Forty-six rams were 7/8 curl or better.

The sheep hunting regulations changed this year and only rams, 7/8 curl or larger, were legal. Approximately 20 rams were known to have been taken on the refuge during the 1979 sheep season.

In Feburary, 1979, a flight to locate sheep wintering areas was conducted. The south-facing slopes along Tustumena Glacier were used by a large concentration of various sex and age groups of sheep. The south-facing cliffs north of the South and North forks of Indian Creek were also extensively used by wintering sheep.

A preliminary sheep winter range evaluation was conducted in July. The slopes above Tustumena Glacier (north side)

appear to receive intensive use. In some areas near the tops of cliffs, there is bare soil from sheep beds and trails. A vegetation analysis is being considered for next year.

c. Mountain Goat. Counting conditions were better for goats in 1979, compared to 1978 and ADF&G employees counted 159 goats, including 120 adults and 39 kids (Table 9).. Although mountain goat hunting was by registration in 1979, overharvesting occurred in several areas on the Peninsula. In 1980, goat hunting will probably be conducted on a permit system.

Mountain goats frequently found on top of the highest crags but seldom wander far from shelter of the steep cliffs.
Photo: Bangs

d. Caribou. In the spring of 1979, 5 caribou from the lowland herd were radio-collared by ADF&G biologists. Limited data indicate that the herd consists of between 55-60 animals. Spring herd composition (6/22/79) was 52 calves/100 cows and 47 bulls/100 cows with 9 of 15 bulls estimated to be trophy size. Fall herd composition (10/22/79) was 37 calves/100 cows and 47 bulls/100 cows with 10 out of 14 bulls trophy size.

Table 9. Summary of Aerial Surveys* Conducted on the Kenai National Moose Range during 1979.

Count Area	Date	Survey Time (hrs)	Rams 7/8	Rams L7/8	Dall Sheep Unclas. Sheep	Dall Sheep Lambs	Dall Sheep Total	Goats Adults	Goats Kid	Goats Total	Observer
Russian Mts. 15-1		--	0	9	35	10	54	0	0	0	L.Nichols
16 15-2	7/ 8/79	1.2	0	0	0	0	0	52 Ad 8 Yr 60	19	79	L.Nichols
21 15-3	8/27/79	3.0	8	20	17	2	47	7	3	10	T.Spraker
22 15-4	8/21/79	3.5	21	40	238	56	355	2	0	2	T.Spraker
23A 15-5	8/26/79	2.5	13	14	47	7	81	23	10	33	T.Spraker
23B 15-6	8/26/79	2.0	4	5	3	2	14	28	7	35	T.Spraker

Total Survey Time - 12.2 hours
Total Sheep Observed - 551
Total Rams Observed - 134
Total Unclassified Observed - 340
Total Lambs Observed - 77

Legal Rams (7/8) Observed - 46
Sublegal Rams Observed - 88
Sublegal Rams/100 Logal Rams = 88/46 = 191 (Approximately 2 to 1)
Legal Ram % of Observation = 46/551 = 8.3%
Lamb % of Observation = 77/551 - 14.0%

Total Goats Observed - 159
Adults - 120 Kids - 39
Kids/100 Adults = 39/120 = 32.5
Kids % of Total = 39/159 - 24.5%

*By ADF&G personnel.

The local game advisory boards again proposed a limited permit hunting season for the lowland caribou. The refuge responded to the game board by opposing any hunt on the lowland caribou until it is determined why the herd has not apparently increased the past 5 years. One radio-collared bull caribou was killed by wolves in the mountains above Jean Lake. Some lowland caribou may annually travel to this area during the winter.

e. Black bear. Black bear were regularly observed throughout the summer. Fewer bear were observed in the spring and fall compared to last year. One possible factor may be the poor berry crop in the fall or some other habitat factor affecting bear distribution. Preliminary results of an ADF&G black bear study suggested that black bears may avoid treeless areas. This behavior may explain some observed differences in moose calf predation rates between the Moose River Flats and Willow Lake rehabed area.

f. Brown bear. Nothing new to report.

g. Timber wolves. Estimates of wolf numbers in 6 monitored packs on the refuge, by Dr. Rolf O. Peterson, suggests a spring density of approximately 38 wolves. Dr. Peterson estimates the early winter wolf density for these six radioed packs to be about 65 wolves. (Fall wolf densities were estimated to be around 85 wolves.)

Trends in pack size in relation to human harvest are being monitored with considerable interest. Preliminary results suggest wolf packs in some areas accessible to aircraft trappers or road systems may not be annually replacing members at the same rate they are being lost. Wolf densities in GMU 15A (north of the Kenai River) appear to be decreasing. A minimum of 43 wolves were reported taken by hunters and trappers in GMU 15 during the winter of 1978-79. This included 24, 5, and 14 wolves from GMU subunits 15A, 15B, and 15C, respectively with a minimum of 12 wolves taken in GMU 7 adjacent to the refuge's eastern boundary

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

Highlighting the Information and Interpretive program on the Kenai was the completion of our new office building with adjoining Visitor Center. Planning for the new Center did not begin until November of this year. However, we are looking forward to year-round use

by both our local and visiting publics. In December, two Y.A.C.C. enrollees were hired to man the information desk, issue permits, run the Natural History Association sales outlet, and help our over-burdened administrative staff with simple duties.

Information and interpretive signs were added to the Russian River Area, and include three information boards all of which add to visitor orientation and proper use of the area. Also, an interpretive display was completed and available for public viewing as of August 1, and in time for the second run of salmon, and associated visitors. The interpretive panels were designed by Kenai's recreation staff and completed by artist Boyd Shaeffer of Kenai Peninsula Community College. The display consists of six 36' by 40' removable panels and are located near the Russian River ferry landing. Three panels tell the complete life cycle of the sockeye salmon in sequence collage. This interpretive display is viewed by the Kenai staff as a major success ranking with any display on the Kenai Peninsula. It combines a visual story with optional narrative. The display is designed to tell a story to all ages including those who choose not to read any captions. The display is specifically designed to foster an appreciation and informed use of the sockeye salmon resource. The back three interpretive panels depict early native use of wildlife resources on the Kenai National Moose Range and particularly their dependence on sockeye salmon for sustenance. The display was designed after research of Tanaina history, interviews with living Tanaians and interviews with informed archeologists. The display incorporates the recently translated Tanaian written language to labeled pictorals within the display. Tanaina was an oral language and has only recently been put into written form. For the brief time period the display was available to visitors during August, it appeared to be quite popular. It is safe to say that several thousand visitors have derived benefits from it already and approximately 50% of the fishermen and their families appeared to be reading it. Visitors seem to be taking pictures and offering positive comments. This interpretive display may be taken down during offseason use and installed inside the new refuge visitor center at Headquarters Lake. This way we hope to make it last several seasons.

The increased emphasis of the Russian River area, as discussed below, did create some staffing shortages in other areas. The trade-off which resulted, forced the closure of the Visitor Contact Station, located on the Sterling Highway. The Station has been open since 1973, with varying degrees of visitor use. The fluctuation in visitor use has been due to lack of available staff, irradic staffing hours, and a Seward Highway construction project, started in 1978. There are no plans to reopen the station until manpower and budgeting constraints are overcome.

The refuge general leaflet was reprinted with some revisions during the year. Although there are still some problems with the printing and graphics used, we feel this is an excellent leaflet. It saves us writing answers to thousands of letters each year, notifies the public of our regulations, and disseminates basic information about the refuge. Most importantly, the leaflet helps to disperse users to areas which are compatible with the refuge's objectives.

B. Recreation

The addition of a Recreation Planner to our staff has made 1979 as a year to be remembered as a time of regrouping and professionalizing the recreation management of the Moose Range. Utilizing the current research done by recreational specialists in similar situations across the nation, several new approaches have been initiated. The long range goal of these projects has been to reduce human use impacts on the resource as well as impacts on our operating costs, while at the same time offering a wide spectrum of acceptable recreational opportunities compatible with the refuge objectives. The new techniques and programs enacted include: backcountry canoe registration, solid waste management, monitoring human use impacts, increased personal contact with the public, litter control measures, a revision of some refuge operating policies, and examination of current regulations.

1. The Swan Lake-Swanson River Canoe Routes have been a very popular backcountry boating area since the building of new trails made it accessible in the late 1960's. Visitor use for the 1979 season has been marked by certain brief periods of high-use such as Memorial Day weekend, but has generally experienced the lowest use in the past 5-6 years. Visitor use the previous years showed a continued increase which sparked an interest in accomplishing three new programs:

   a. Distribute information of wise use of the area to entering groups.

   b. Reduce impacts of visitors on the area during visits.

   c. Initiate a formal program of site impact monitoring.

   A backcountry registration system was initiated for the area which included a detachable tag containing information to be kept with groups in the area. The groups would also leave a stub at the trailhead which included information which could later be used to examine the profile of users in the area. This registration tag included helpful hints for having a wilderness experience and reducing impacts. They included

reduction in group size, hints for minimum impact camping, dispersing use, and safety hints. Possible benefits to our program appear initially to be a more informed public, less littering, accurate monitoring of user numbers, a regulation compliance tool, and informing the public that the area is a managed recreation area on a National Wildlife Refuge. We estimate 90% of the groups using the area complied with our new system and we received no complaints on its use. The registration requires no reservations and is easy for canoeists to use.

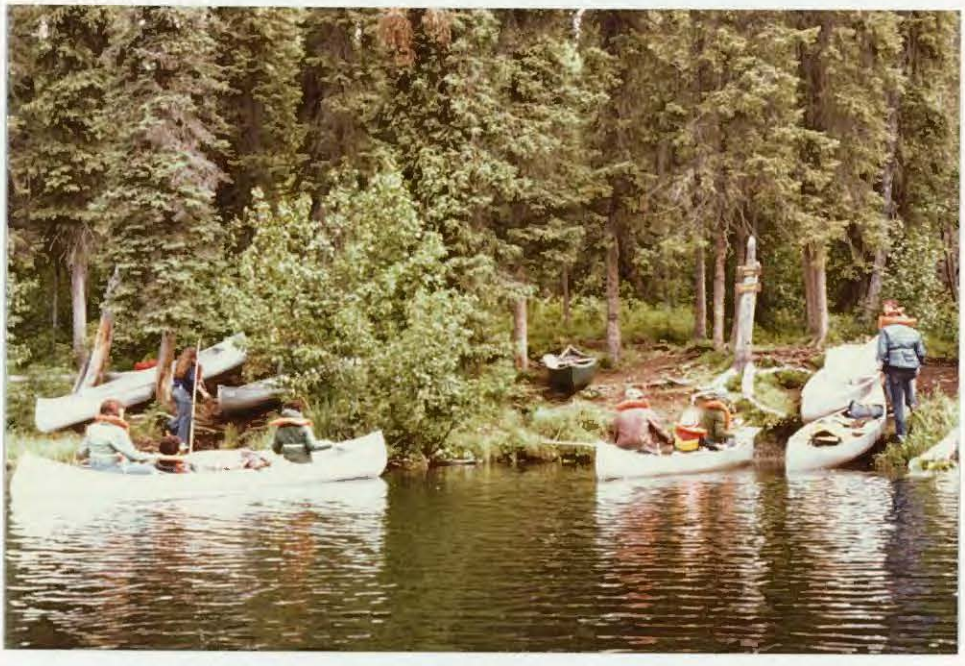
No fish and a leaky canoe sometimes makes an unhappy fisherman. Photo: Canaiy

In conjunction with improved information and use of the back-country registration for canoers, we improved trailhead signing which included silk screen canoe signs, refuge regulations, a brochure dispenser, and "pack it home" litter signs. We estimate at least 800-1000 plus canoe brochures were dispensed at the all weather trailhead dispensers.

The canoe system also was monitored for the first time by a full time "canoe trail patrolman". This employee was used to direct refuge quality control on Y.C.C. projects in the area, public contact, regulation compliance, and to initiate the first phase of a dispersed recreation site monitoring program.

Code-A-Site is a dispersed recreation site monitoring tool which was developed as a systematic method for inventorying camping impacts. It was developed by the U.S. Forest Service in Region 6 and has been used successfully by both the Forest Service and Park Service in the lower 48. It's initiation on the Kenai National Moose Range is still in its early stages and represents one of its first applications in Alaska. If successful, this inventorying of dispersed camping sites will be applied to other areas on the KNMR. An inventory of this nature should be the first phase of a planning effort within various areas of the KNMR. It can be applied to roaded and roadless areas.

Lisa Shone conducted a formal study of recreationists in 1974-75. Although her work was never published, Kenai staff corresponded with Lisa and received preliminary results from her study. Lisa's work was consulted during "canoe system management planning" and will be in the future. (An example of the types of data she came up with is that canoe system users had a high percentage of orientation with over 80% having map or guide book for the area.)



Canoes - Y.C.C. crew maintaining the canoe system portages.
Photo: Keller

2. Russian River has been a topic familiar to us all, and much of our attention has been directed to the management of this small complex. The year 1979 started out with a cooperative meeting between Alaska Department of Fish and Game, Chugach National Forest, Kenai National Moose Range, and U.S. Fish and Wildlife Service Area Office staff. Several topics were discussed including history of the area, cooperative management, existing facilities, quality fishing, crowding, archeological sites in the area, site improvements, and divergent agency goals.

Sparked by a high interest in improved management of the area by Area Office staff, an interim management plan was developed for 1979. Summarized, the plan included site design improvements, additional field toilets, improved signing, increased public contact, increased personnel, increased special use permit fees for the Kenai River ferry operation, information and interpretive signing, segregated tent camping, and late in the process the area was designated a U.S. Recreational Fee Area. Several options were considered and an entrance station and self-service fee dispenser were both constructed. (Note: Chugach National Forest also introduced a manned entrance station for their associated campground.) The fisherman-use during the 1979 season at Russian River was marked by certain peak days which tended in the direction of previous year's

high use; however, weekdays seemed somewhat down in use from 1978 (probably due to highway closure, and fewer tourists from out of state). Interviews with Sterling Highway restaurant and service station owners, indicated very low weekday travel and above average weekend travel. Subsequently, though overall use may have been slightly down, peak one day visitation at least seemed to equal previous years' high use days. Additionally, emergency closures reduced actual fishing days considerably this year. The rapid surge of salmon in early August, however, prompted very heavy use for a short duration (7 days) once the fishing was reopened. ADF&G reported 55,000 man days of effort for the total fishing period. The high individual stream count was 721 anglers on August 4, though weekend average stream counts were 276.8 anglers and weekday counts were 190.6 anglers. Programs actually initiated this season included litter control measures, increased personnel available at the site, better orientation for visitors, increased law enforcement, a new interpretive display, more efficient solid waste disposal, improved facility design, and improved facility maintenance.

Weekend crowds at Russian River fishing for red salmon. There are many other areas on the refuge, and on Russian River, where you can fish all day and not see another person. Photo: Berns

The litter control program was partially a success and will be continued during 1980. Employees were only partially successful in keeping excessive disposable containers from being carried across in the ferry. Litter, however, was less than in previous years and several complimentary remarks have been received from longtime users of the area concerning its appearance this year. This program could be improved if additional personnel were available to make contacts at the ferry crossing or through increased assistance from ferry employees.

A "litter incentive" program was also used with much success at our Russian River facility this summer, and to our knowledge, represents its first application in Alaska. Both U.S.F.S. and refuge personnel used the incentive litter control program within their respective campgrounds. (The incentive program was also developed by the Pacific Northwest Forest and Range Experiment Station, Wildwood Recreation Branch, U.S.F.S., Region 6.) Described briefly, the program utilizes children of campers and fishermen in the area to collect ground litter. Refuge personnel received permission from parents and supervised a group of "assistants" to do a litter patrol. The young assistants are then given their "incentive" which sometimes consists of a junior ranger card, a "Smokey Bear" patch, a Fish and Wildlife poster, or some other miscellaneous award. This program seems to work well in concentrated high use situations. Hopefully, the program provides a deterent to adults littering and simply puts more souls on the "good guys" team, to assist in picking up litter. We hope to develop a formal award packet for incentives next year. This program can combine public contact, campground patrol, outdoor education, and volunteer assistance all at the same time. It is quite popular with everyone.

The fee collection program and entance station should be considered a success as far as increased contact with the entering public, and distribution of written and verbal refuge information are concerned. Also, it provides a central location for initiating other programs. Its weaknesses include drawing valuable employee time from other programs (i.e., litter patrol, maintenance, visitor contact station, and on-site public contact).

Though the Russian River "scene" will always be one that challenges our combined efforts, the key to its successful management is having employees available to get the miscellaneous duties completed. This involves having employees available for as many hours as possible and living in the area. This year, we worked out an agreement with Wildlife

Research, and utilized a house trailer at a nearby refuge site. Justified by operation improvements this summer due to personnel availability, we believe we need more personnel, temporary refuge housing, and expanded hours of availability to the public on the east-central portion of the refuge. By having housing available on location, we estimate at least 500 hours saved in travel hours alone.

3. Hunter Check Stations - during the August and September hunting season, traditional programs as well as new programs were used to monitor hunter use and characteristics. During August, observers were placed at several mountain lakes. This program allows us an exact count on Dall sheep and bears harvested, as well as a public contact with a generally difficult to monitor activity. During the September 1-20 moose season, hunter check stations were established on Mystery Creek and Swanson River Road. Swanson River Road is open year around and Mystery Creek is open only for the month of September. This program was seemingly popular with the public as well as with various staff. Employees of the check stations asked hunters various questions pertaining to harvest success, where they hunted, other activities, length of stay, previous visits to the refuge area, etc. The check stations contacted over 600 parties during the Labor Day weekend. The stations were operated for biological and public use information as well as a subtle law enforcement/public contact tool (see data). Contacts with hunters and other recreationists were informal and pleasant and refuge personnel were able to assist hunting parties in complying with refuge and State regulations.

   A preliminary look at the information gathered shows many other recreationists took advantage of the opening of Mystery Creek Road and that many parties were engaged in multiple recreational activities. Chart no. 1 reveals some of the information collected.

Chart No. 1

MOOSE CHECK STATION DATA - 1979

Dates Sept.	SWANSON RIVER 1-3	4-7	8-9	15-16	Total	MYSTERY CREEK 1-3	4-7	8-9	15-16	Total
# Hunters	619	173	90	148	1030	380	135	148	71	734
Non-Hunters	132	40	20	43	235	67	28	35	9	139
Local Hunters	512	138	77	70	797	262	98	98	36	496
Non-Local Hunters	107	35	13	68	223	118	37	42	35	232
# Days-Resident	360	170	84	103		181	83	96	33	
# Days-Non-Res.	127	59	17	31		96	61	61	53	
Average Days:										
Resident	1.36	1.97	1.95	1.40	Average 2.03	1.41	1.56	1.71	1.0	Average 1.7
Non-Res.	2.03	3.10	2.10	2.38		1.71	2.77	1.65	2.0	
Moose Taken:										
Resident	16	8	6	7	45	3	0	2	0	6
Non-Res.	3	1	0	4		1	0	0	0	
Local Parties										
Off Road	158	43	28	24	273	105	43	15	38	201
On Road	105	43	15	38	201	23	25	24	9	81
Non-Local Parties										
Off Road	40	14	7	10	71	49	16	11	13	89
On Road	23	5	1	3	32	7	6	17	15	45

Moose Check Station at Mystery Creek. Some hunters lead a dog's life! Photo: Johnston

4. Special Use Permits - during the late summer and fall of 1979, a draft plan was developed for future operation of commercial tent camps and was approved in 1980. The plan includes a complete package for allocation and management of these areas. We met with operators in October and finalized the program. Research and background for this program included a comprehensive review of records back to the 1950's on swans and other wildlife, files of each operator, review of the Wilderness Act, and interviews with past refuge employees.

5. Other I&R staff activities have involved preparing recommendations for the Sterling Highway realignment, involvement with the Kenai Peninsula Land Manager's Task Force, and informal comments on a National Trail proposed by HCRS to traverse the Kenai Peninsula. Each of these projects have assisted in the formulation of the I&R goals for the Moose Range.

In summary, the recreation staff has been kept rather busy during 1979. Total public use of the Kenai is estimated to be 140,000 visitors, a figure which has been fairly stabilized since 1975. Our plans for the 1980's will not be formalized until completion of the Master Plan; but most likely will include capping off public use; reducing the number of facilities; and directing the public toward a more ethical use of the resources.

C. Enforcement

We have had another year of excellent cooperation with the Alaska Fish and Wildlife Protection working together on and off the refuge. In order to work on some of the State of Alaska violations off of the refuge, Berns received an appointment of "Special Officer" from the Department of Public Safety under the Alaska State Troopers.

Problems continue for enforcing trespass cabins along the coastline on the Tuxedni Refuge. One of the illegal cabins in question is pending because part of it comes under the Alaska Native Lands Settlement Act. Rather than take action, the Service is waiting to see if the individual will be given his allotment.

Violations During 1979

Violation Type	Number of Cases
Fishing w/o license	3
Snowmachine in prohibited area	1
Motor Bike in prohibited area	1
Motor Boat in prohibited area	1
Driving vehicle in prohibited area	3
Parking in No Parking Zone	21
Dropping objects from airplane	1
Landing aircraft in prohibited area	4
Shooting fireworks	1
Shooting cow moose	1

The biggest problem with the enforcement program is processing the cases through Federal Court. All cases must be sent to Anchorage. For the individual who pays his fine by the bail bond, the case is closed; however, those who request a hearing, it may take up to seven or eight months, and then the case is often dismissed. The State does not have a bail system for violations and the individual must appear in Court, usually within a few days, when he is given a citation. The case is heard and judgement is made at that time, unless the accused requests a trial. For the sake of expedience, any case that is made on the refuge that can be prosecuted in the State Court is turned over to the State Fish and Wildlife Protection.

VI. OTHER ITEMS

A. Field Investigations

1. Wolf-Moose Predator-Prey Study - Investigators: Rolf O. Peterson and James D. Woolington.

The wolf-moose predator-prey study continued through 1979. The year began with 25 radio-collared wolves in 6 packs which were monitored for activity and predator-prey relationships with an additional pack radioed during the summer. This year, 7 wolves were live-trapped and 11 darted from a helicopter. Of these, 7 were recaptures from previous years and have proven valuable for long-term information on individual wolves. During the year, 5 radioed wolves were shot or trapped, 6 experienced known transmitter failure, and 6 were listed as "status unknown" (either dispersed out of the study area or unknown transmitter failure). Sixty-nine moose carcasses were examined for cause of death, sex, age, and physical condition, and 27 wolf and 36 coyote carcasses examined for age, sex, weight, and general physical condition. Skull measurements from wolves taken on the Kenai Peninsula continue to be recorded for an ongoing study of wolf taxonomy. Other activities include bone-marrow fat content analysis (an index of condition) of wolf-killed moose, den and rendezvous-site scat collection and analysis, and an automatic monitoring system for den-site activity. In January, principal investigator Dr. Rolf O. Peterson returned to his position as assistant professor at Michigan Tech. University to begin data analysis of the research findings. Field work was continued by the refuge staff.

Peterson presented a paper at the 1979 Portland Wolf Symposium entitled "The Extirpation and Reappearance of wolves on the Kenai Peninsula, Alaska." In this paper, historical information of Kenai Peninsula wolves was reviewed and synthesized in view of current research findings.

Woolington with a new radio instrumented wolf. Each animal is given antibiotic and vitamin shots before being released. Photo: Bangs

Spotting and radio telemetry from the Super Cub is used to keep track of pack while the Copter crew moves in to dart an individual animal. Photo: Berns

2. Nutritional Basis for Qualifying the Capacity of the Kenai National Moose Range to Support Moose. Investigators: Wayne Regelin and Dennis Meeker, Denver Wildlife Research Center. Period: 1977 - 1982. Work continued using six captured moose that were raised at the Moose Research Center. These moose have been trained to accept handling and confinement in the respiration chamber for metabolic rate measurements. These and other moose will be used to:

   a. Estimate the quantity of food intake during each season.

   b. Obtain activity budgets of free-ranging moose for 24-hour periods each season.

   c. Measure the fasting metabolic rate of moose each season.

   d. Measure rumen turn-over time each season.

   e. Determine rumen volume in different sex and age classes of moose.

   Other objectives to develop a carrying capacity model for moose of the Moose Range include:

   a. Mapping vegetation types on the Kenai NMR.

   b. Sampling each type for estimates of shrub density and standing-crop biomass of herbage and forage.

   c. Determine forage preferences of moose throughout the year.

   d. To evaluate the nutritional quality of major forage species throughout the annual cycle.

3. Moose Research Center Studies - Investigators: A. W. Franzmann and C. C. Schwartz, Alaska Department of Fish and Game. Period: 1977 - 1980. Research continued on the black bear project that was initiated in 1977. Black bears were captured in the vicinity on 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. Preliminary results suggest black bear avoid open habitat and that this behavior may result in the different mortality rates witnessed among moose calves born in open versus dense vegetation types.

   This past fall, an experiment in moose reproductive biology was started. All bull moose in one Moose Research Center pen were removed to allow the cow moose to experience their first estrus period without being bred. A bull was then put into

the pen in late October to determine if cows bred during the second estrus period, would have late calves, smaller calves, or if there would be any differences in calf production. These results should be known by the summer of 1980.

4. Summer Ecology of the Common Loon - Investigator: Elizabeth Smith, University of Colorado. Period: 1979 - 1980. Work was started last summer on a Master thesis project to study nesting common loons on the refuge's lowland lakes. The basic biology of this bird is being investigated as well as the possible effects of disturbance by canoeists on loon reproductive efforts.

5. Lowland Caribou Study - Investigator: T. Spraker, Alaska Department of Fish and Game. Period: 1979. The local Alaska Department of Fish and Game biologist radio-collared 5 caribou this past spring to obtain basic data on the lowland herd. A maximum of 59 caribou were seen at any one time. This herd has a high ratio of calves (53) per 100 cows, but for unknown reasons, the herd has not increased in the past 5 years even though it has an apparently high reproductive potential and is not hunted. The one radioed bull was killed by wolves in December. The four radioed cows have remained in the main herd which has wandered widely over the northern lowlands.

6. Willow-Insect Relationships - Investigator: M. Furness, University of Idaho. Period: September, 1979. Dr. Furness spent 3 days collecting insects from willow on the refuge. The most common insect appeared to be saw-fly larva. Willows on the eastern portion of the refuge had few insect galls and were heavily browsed, while willow on the western edge of the refuge had numerous insect galls and were not as heavily browsed. Dr. Furness commented that he had noticed that ungulates often avoid parasitized plants.

7. Fishery Resources - Investigators: L. VanRay and J. Friedersdorff. Period: 1979. Fishery field work on the refuge was limited this year because of planning commitments. A weir was set up on the Swanson River for enumerating silver salmon and limited water sampling was accomplished.

B. Cooperative Programs

1. Y.C.C. - The Kenai NMR hosted a summer Y.C.C. camp for the year. However, this year's program was much reduced from the past with only 20 enrollees working for 6 rather than 8 weeks. The four-day work week again proved a great asset to the efficient operation of this non-resident camp.

2. Y.A.C.C. - By the close of 1979, the Kenai was still in frustration trying to establish a Y.A.C.C. program on the station (see 1978's report for a review of how this 1-1/2 year battle has progressed.) By September, we did get authority to start hiring enrollees. Although a staff is still not approved, the 8 enrollees on board have been a tremendous asset in continuing maintenance projects, aiding the administrative staff, manning the new Visitor Center, aiding the planning effort, and handling their own administrative tasks.

   Hopefully by the summer of 1980, the Y.A.C.C. camp here will be supporting 20 enrollees and two crew leaders.

3. CETA - During the summer, two young local natives were hired through the CETA program. The boys helped out with painting the old headquarters facility, mowing lawn, and other miscellaneous duties.

   Through CETA, we have attempted to hire additional professional assistants. Unfortunately, budgeting cuts came early in the year and all proposals were put on the shelf. We are hoping that a new fiscal year, beginning October, 1980, will enable us to gain this additional staff.

4. Alaska Natural History Association - A cooperative agreement with ANHA was signed in the early fall. With the opening of the new Visitor Center, the refuge began operating a sales outlet for this cooperating association. At the time of this writing, the bookkeeping involved far exceeds our sales. However, with the upcoming tourist season and as the word spreads, we are certain that this program will grow into something beneficial to the refuge interpretive program.

5. Russian River Fish Bypass - Several trips were made to the Russian River Falls area with Alaska Department of Fish and Game engineers and fishery biologists and the contractor. These trips were made to coordinate disposal of tunnel waste material, to inspect construction procedures, and at the project's completion, to insure that the contractor fulfilled the obligations specified in the SUP.

Inspecting part of the new ADF&G F.R.E.D. project fish pass at the falls on Russian River. Photo: Richey

6. Special Use Permits - The same 10 permit holders operated 28 commercial tent camps in 1979 as in 1978. However, Mr. Jack Newell sold his business and the camp at Kraenberri will be phased out as it was in conflict with nesting Trumpeter swans on an adjoining lake.

Listed below are the permittees and their camp locations:

Anderson, Gary - Big Red's Flying Service, Anchorage

2 tent camps - Two Island Lake

1 tent camp - Kuguyuk Lake

Aregood, Bill - Alaska North Flying Service, Anchorage

1 tent camp - Trapper Joe Lake

Carrell, Dean - Alaska Travel Air, Anchorage

1 tent camp - Vogel Lake

Cogger, Donald - Alaska Air Guides, Inc., Anchorage

4 tent camps - King Lake

Newell, Jack - Totem Airways, Inc., Anchorage

1 tent camp - Kraenberri Lake

Ketchun, L. H. - Ketchum Air Service, Anchorage

3 tent camps - Snag Lake

1 tent camp - McLain Lake

1 tent camp - Wilderness Lake

1 tent camp - Scenic Lake

Klosterman, David - Alaska Bush Carriers, Inc., Anchorage

2 tent camps - Mull Lake

2 tent camps - Bedlam Lake

1 tent camp - Sportfish Lake

Lee, Jack - Lee's Air Service, Anchorage

1 tent camp - Neckshorta Lake

1 tent camp - Lower Tangerra Lake

Rust, Hank - Rust's Flying Service, Inc., Anchorage

1 tent camp - Bird Lake

1 tent camp - Tangerra Lake

1 tent camp - Sandpiper Lake

1 Register boat - Vogel Lake

Willard, Jess - Willard's Moose Camp, Homer

1 cabin - Caribou Hills

Other permit holders include Mr. Carleton Towne, Sr. of the Sportsman's Lodge who has a SUP to operate a ferry boat across the Kenai River at the confluence of Russian River for sport fishing, and Bill Wright of Alaska Outdoor Adventures, who offers one day river float trips on the Kenai River.

7. Oil and Gas

a. Beaver Creek Field - there were no drilling operations conducted within the Beaver Creek Unit this period. The Unit operator, Marathon Oil Company, does not propose further drilling unless a market develops. There are four gas and two crude wells in the Field. Three gas wells are capped and one used occasionally for gas-life purposes. The only revenue producer, crude oil, has remained about

600 bbls/da and is trucked from refuge lands to North Kenai refineries. Cumulative production for this Field through November 30, was 2,109,104 barrels of oil.

b. Swanson River Field - although no major work or drilling programs were anticipated within the Field in the Fifteenth Plan of Development and Operations, some projects did materialize. Between August and December remedial workover of four wells (SRU 13-4, 21A-6, 31A-16, 21,15) was accomplished with Brinkerhoff Rig No. 60. Each well posed its own downhole problems requiring the removal of damaged tubing, recovery of wireline tools, stimulation of the production interval or the segratation of a production interval with packers. This $2 million project proved mostly unsuccessful, for only two of the four wells following workover went on to produce together 110 barrels/day. Later, a third well failed and the remaining well was producing only 80 bbls/da.

During mid-summer at three well locations in the northern portion of the Field, certain electric injection pumps and supporting auxiliary equipment were found necessary for increased crude production. The underground installation of 480V three phase electric power service from the main powerline source was approved for each site.

An operating 6-inch crude line north of Tank Setting 3-9 worked its way above the Swanson River exposing 20 feet of tubing. A new section of 6-inch tubing, placed within a 10-inch casing, replaced the original pipe and was reburied a minimum of 42 inches beneath the Swanson River bed.

Late December in support of ARCO's planned 185 mile seismic program, Chevron U.S.A., Field Operator, provided an abandoned well pad (SRU 22-23) for the temporary placement of a 70-man field camp.

Of the estimated 437,000,000 barrels of crude in place within the Swanson River Field, 185,884,911 bbls or 42.5 percent has been recovered since 1957. At today's crude prices, it is hoped 50 percent will be recoverable, twice the National average! Daily production shipped via pipeline to North Kenai, 20 miles west of the Field, averaged 11,900 bbls. Each day using 10 wells about 335,000MCF gas is reinjected at nearly 6000 psi into the Hemlock production zone (10,400-11,400 feet) to maintain downhole pressures and proper crude recovery. Although there are similar pressure maintenance systems in operation through-

out the world, the Swanson River Field's 15 compressor unit facility, some at more than 4,000 H.P. each, is unique in producing final stage pressures of about 6,000 gpsi.

Propane production, a spin-off of the crude/gas separation process, is down to 8,500 gals/da, slowly decreasing because of reduced crude production.

C. Items of Interest

Maintenance Mechanic Bud Beard accepted a similar position on the Sheldon-Hart NWR, transferring in December. We'll miss Bud's multiple talents here on the Kenai, but wish him the best of luck down in his "home country". A "Kenai style" going away party was held for Bud and Kathy on December 14.

Following several summers of seasonal employment on the Kenai, Ed Bangs returned as a career seasonal Biological Technician (GS-5) after having completed his Masters at the University of Nevada, Reno. While Ed and Nanette are no strangers to the Moose Range, it's nice to have them in the area on a permanent basis!

Y.A.C.C. enrollee Wally Jakubas was a welcome addition to the Kenai staff during the year. A graduate of Purdue University, Wally brought a unique blend of talents to a position normally considered in the "labor" category. Wally was later able to secure a permanent position with the Alaska Department of Fish and Game, stationed in Kodiak. Best of luck Wally!

Clerk-typist Pat Fencl came on board in April to fill a real void within the administrative area. Pat brings several years of experience as a civilian administrative employee with the military.

The lonely life of an Alaskan bachelor eventually proved too much for Assistant Forester Jim Lewandoski. Jim and former Kenai employee Karen Munson were married October 6, in Minnesota.

The Moose Range staff, in conjunction with the Alaska Department of Fish and Game, and Wayne Regelin of the DWRC, hosted the 15th North American Moose Conference in March. It was a unique experience for the entire staff to be involved in the proceedings of this conference.

Rick Johnston was selected to fill the BLHP Outdoor Recreation Planner position in January. Rick completed his undergraduate work at the University of Illinois, and received his M.S. in Outdoor Recreation from the University of Washington, Seattle.

The staff remained mobile throughout the year with Jim Lewandoski and Linda Gintoli attending the Refuge Academy at Beckley in April and May. Linda then went on to Glyncoe, GA to attend law enforcement training with ARM Vern Berns. Rick Johnston and Linda Gintoli attended the Regional Association of Interpretive Naturalists' Workshop in Juneau, where Linda gave a slide presentation on the Russian River and the use of interpretation as a management tool.

Biological Technician Jim Woolington and Biologist Ted Bailey attended the Portland International Wolf Symposium in August where Jim co-authored a paper with Rolf Peterson entitled "Extripation and Reappearance of Wolves on the Kenai Peninsula, Alaska."

Ted Bailey keynoted and presented a paper at the First Research Conference on Bobcats, held in Fort Royale, VA in October. The paper was entitled "Den Ecology, Population Parameters, and Diet of Eastern Idaho Bobcats." Ted's expertise in bobcat ecology resulted in his testifying in a Washington, D. C. Court case involving Defenders of Wildlife vs. Endangered Species Scientific Authority (ESSA) in November.

Three seasonal employees, Chris Degerness, Donna Bartman-Stroud, and Jeff Gordon, all received $100 cash awards for their efforts in administering Kenai's first fee collection system at Russian River.

The entire staff is to be commended for "hanging-in-there" during a most difficult year. The local protests, pickets, petitions, and general anti-government sentiment so prevelant in 1978 carried over throughout 1979. The confusion, uncertainities, rumors, misconceptions, and blatant bad press over the entire Alaskan Lands legislation kept us on the defensive most of the year. Continued negotiations with Native Villages and Corporations in attempting to settle land claims under the Alaska Native Claims Settlement Act, found many of us playing roles far outside of the resource management field. To make things even more interesting, the growing controversy over wolf control management and wolves vs. moose on the Kenai resulted in further driving a wedge of divisiveness between us and our State collegues and the local populace. Hopefully, many pending decisions will be made in 1980 as the FWS solidifies its position on a number of critical issues.

D. Safety

Safety meetings were held monthly throughout the year. Each staff member conducted at least one meeting on a safety subject that ranged from fires, snowmachines, first aid, boating, backpacking,

aircraft, chain saws, winter survival, CPR, to electric lights and circuits. Several of the meetings included films and, on occasion, a guest speaker from the fire department or Alaska State Troopers.

Our safety record was marred this year by several accidents. Berns and Richey were involved in an aircraft accident while on patrol at Tuxedni. Although the airplane was flipped over and sunk on takeoff, both men escaped with only some bad bruises and a salt water dunking.

Two accident reports were filled out on the Y.A.C.C. group during the year. Fortunately both were minor; one, the individual slipped on an icy road and landed on his knee, and later the same individual lanced his leg by walking into a branch while working in the timber.

While moving into our new office headquarters, the secretary was helping move a desk when it slipped and jammed her finger. The biological technician sprained his back while weighing a 90 pound wolf.

The refuge manager, while attending a conference at Karlak Lake, experienced chest pains and had to be air-evacuated to the Kodiak Hospital. He was referred to a cardiologist and further treatment in Anchorage after a few days in the hospital. Jim is back on full time duty with no restrictions on what he can do.

The Area Office Safety Officer conducted a refuge inspection in February; and later, June 21-22, a Defensive Driving course and a First Aid course was offered for Y.C.C. staff and refuge employees.

TUXEDNI NATIONAL WILDLIFE REFUGE
(TUXEDNI WILDERNESS)
Chisik Island, Cook Inlet, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1979

NATIONAL WILDLIFE REFUGE SYSTEM
Fish and Wildlife Service
U.S. DEPARTMENT OF THE INTERIOR

TUXEDNI NATIONAL WILDLIFE REFUGE

Only two inspection trips were made to Chisik Island which makes up the Tuxedni Refuge. Both trips were made concerning cabin sites used by commercial fishermen and not for biological data.

Except for the use that stems from commercial fishermen for boat protection and anchorage, and the few gillnet site fishermen, the refuge gets very little public use.

Last year, a few commercial clam diggers set up tents on the island rather than use the mainland for protection from bears possible raiding their camps.

The bulk of the nesting rookeries for black-legged kittiwakes and horned puffins are located on the southern tip, southeastern side, and Duck Island. The clam diggers' camps and gillnet cabins are near the northern end of the island.