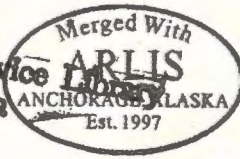


U. S. Fish and Wildlife Service
Anchorage, Alaska



KODIAK NATIONAL WILDLIFE REFUGE
Kodiak, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1978

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



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KODIAK NATIONAL WILDLIFE REFUGE
Kodiak, Alaska

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ANNUAL NARRATIVE REPORT
Calendar Year 1978

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



PERSONNEL

- | | | |
|-----|-----------------------|-----------------------------------------------------------------------------------------------|
| 1. | Robert L. Delaney | Refuge Manager PFT, GS-12
(EOD - 07/03/77) |
| 2. | Michael T. Vivion | Assistant Refuge Manager PFT, GS-11
(EOD - 03/26/78) |
| 3. | John Trapp | Assistant Refuge Manager PFT
(EOD - 09/01/76 - Trans. 06/03/78) |
| 4. | Harvey Heffernan, Jr. | Assistant Refuge Manager PFT, GS-9
(EOD - 09/10/78) |
| 5. | Edward R. Hajdys | Refuge Manager Trainee PFT, GS-5
(EOD - 02/26/78) |
| 6. | Michael B. Rearden | Native Liaison Specialist PFT, GS-9
(EOD - 10/24/76) |
| 7. | Dorothy Dryden | Administrative Clerk(typist) PPT, GS-5
(EOD - 02/26/78) |
| 8. | Karen Hawley | Clerk Typist, TPT, GS-3
(EOD 06/04/78, converted to Career-
Seasonal 10/27/78) |
| 9. | Dennis Zwiefelhofer | Biological Technician, GS-5
(EOD - 06/15/78 TFT, converted to
Career-Seasonal 12/14/78) |
| 10. | Nancy Norvell | Biological Aid, GS-3, TFT
(EOD - 07/03/78 - Term. 10/13/78) |

11. Lorna Ream

Biological Aid, GS-4, TFT

(EOD - 06/06/78 - Term. 11/17/78)

12. Additional Personnel

Two to four YACC personnel supplied
by the Forest Service for various
periods during June through August

Review and Approvals

Robert L. Deley 3/14/79
Submitted by Date

Jan C. Ruff 6/29/79
Area Office Date

Kudlak Nuz
Refuge Date

Regional Office

US FISH & WILDLIFE SERVICE--ALASKA



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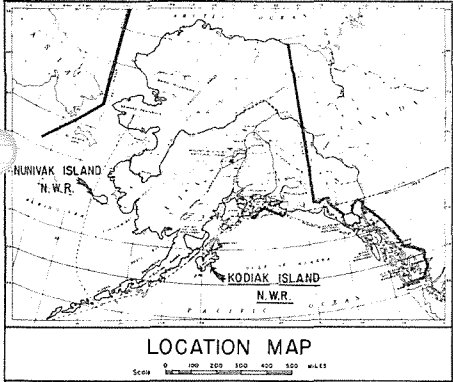
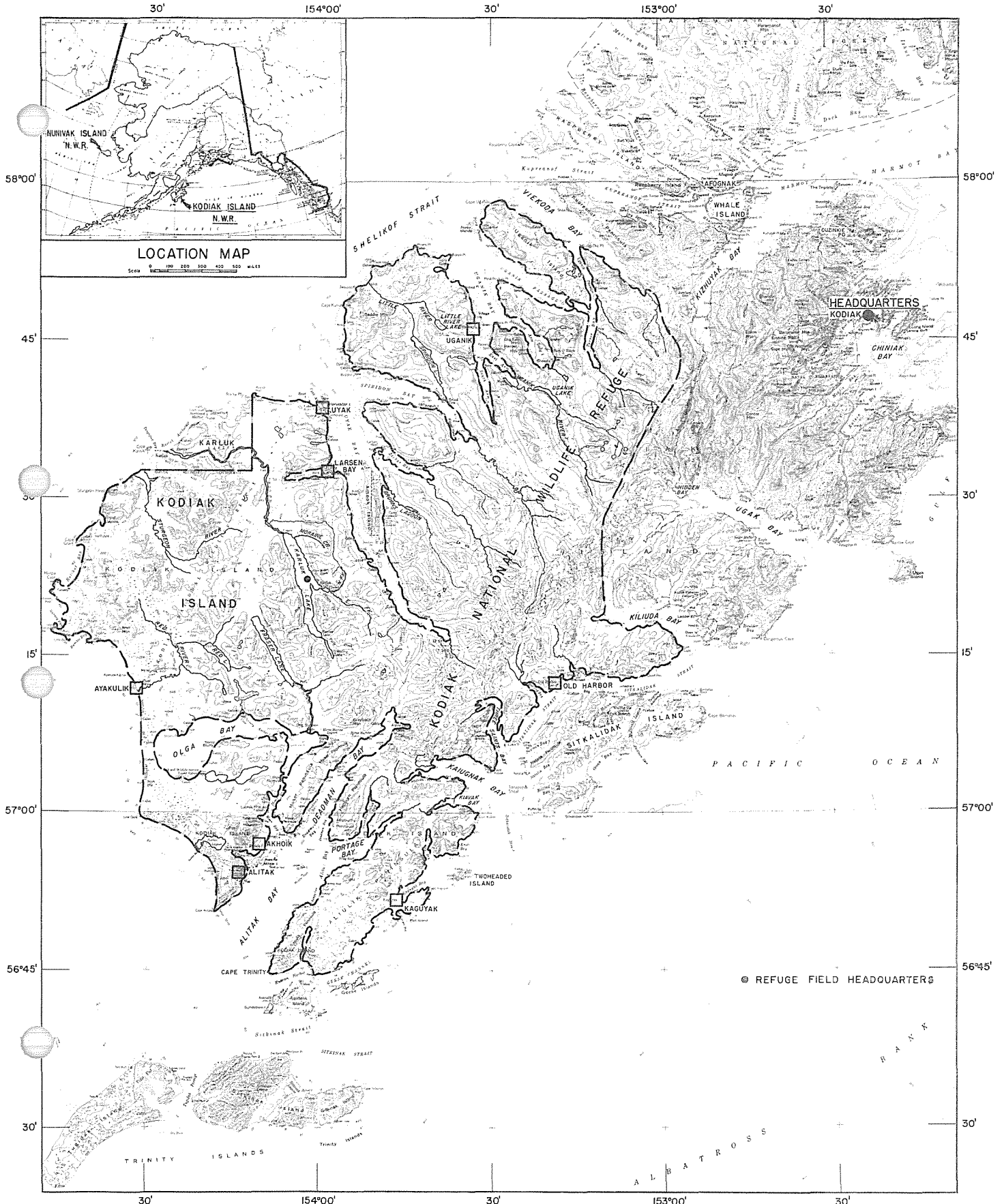
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KODIAK ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

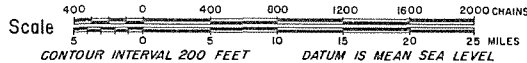
ELECTION DISTRICT NO. 13 — KODIAK, ALASKA

U. S. FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



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FROM SURVEYS BY U.S.G.S. AND NATIONAL
PARK SERVICE
PORTLAND, OREGON AUGUST 1964

SEWARD MERIDIAN



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TOWNSHIP
DIAGRAM



MEAN
DECLINATION
1962

I. GENERAL

A. Introduction

The Kodiak National Wildlife Refuge is comprised of Kodiak Island and adjacent Uganik Island. It was established by Executive Order 8857, August 19, 1941, to preserve the natural feeding and breeding grounds of the giant Kodiak brown bear and other wildlife. This farsighted action of President Franklin D. Roosevelt demonstrated a national interest in the welfare of the island's unique wildlife resources.

Kodiak Island is 100 miles long by about 60 miles wide and is one of the largest and stormiest islands in the United States. The Refuge encompasses 1,815,000 acres, comprising the southwestern two-thirds of Kodiak, and all of Uganik Island.

The rugged Kodiak mountains are the most prominent physical feature and offer spectacular scenery. Summit altitudes are between 2,000 and 4,000 feet and at least 40 cirque glaciers, all less than 2 miles long, occur along the main divide. Most of the island was ice-covered during the Pleistocene glacial epoch except for the southwestern portion, which was glaciated much earlier.

The 800-mile coastline is extremely irregular, having many inlets, bays and islands. Clear swift-flowing streams with gravel bottoms drain mountain snowfields. Nine major rivers flow southwest into Shelikof Strait. Karluk Lake is the largest and most scenic of 271 freshwater lakes and is 12 miles long by about 2 miles wide. About 1,000 small ponds are scattered over the glacial-sculptured topography, many occurring in chains along the main glaciated valleys.

Both the Canadian and Arctic life zones of North America are evident with the former represented by stands of lofty Sitka spruce in the uplands of the northeastern third of the island, and by balsam poplar and some Kenai birch and willow in the bottomlands. Dense alder thickets occur in the foothills and on steep slopes, and elderberry and devil's club are commonly interspersed in extensive meadows of bluejoint grass.

The Arctic zone is most conspicuous in the rolling, treeless terrain of the southwestern portion of the island and in the alpine areas. Crowberry, lowbush cranberry, spirea, blueberry, and a rich variety of broadleaved flowering plants occur on these permafrost-free landscapes.

B. Climatic and Habitat Conditions

The following table includes important weather data for the Kodiak area as compiled by the National Weather Service in 1978.

Table 1. Kodiak Weather Data

	Snowfall (Inches)	Precipitation			Temperature				Wind	
		1978	Normal	Deviation from Normal	Max	Min	Avg	Dev.	Avg mph	Max Gust (Knots)
January	3.9	11.58	5.01	+6.57	41	20	35.9	+5.5	13.6	46
February	16.7	11.56	4.89	+6.67	45	1	33.2	+1.8	17.3	56
March	7.0	3.63	3.85	-0.22	46	22	35.4	+3.3	11.7	36
April	1.6	6.49	3.81	+2.68	52	24	39.7	+2.8	11.6	38
May	0.0	11.05	4.35	+6.70	60	30	43.8	+0.6	12.2	41
June	0.0	0.70	4.12	-3.42	70	49	50.2	+0.5	8.4	25
July	0.0	4.04	3.54	+0.50	68	43	52.3	-1.8	9.0	29
August	0.0	3.53	4.30	-0.77	75	41	57.1	+2.2	8.9	28
September	0.0	5.85	6.11	-0.26	65	37	51.0	+1.0	9.9	48
October	0.0	12.18	6.28	+5.89	60	28	44.1	+3.4	9.7	36
November	3.9	6.69	5.41	+1.28	51	20	39.3	+4.5	11.8	50
December	8.6	9.95	5.03	+4.92	48	12	35.6	+5.7	12.9	58
Totals	41.7	87.25	56.70		Aver.		43.13		11.4	40.9

Yearly temperatures averaged nearly 3 degrees above the normal of 40.5°. Temperatures during the winter months of November through February were, however, nearly 4.5° above normal. This produced abnormally long periods of rain - foggy winter periods with little or no visibility.

Rainfall was 30.55" above the normal of 56.70". All but four months had above normal rainfall and five months had 5 or more inches above normal!

Snowfall was less than one-half the normal of 90", with 41.7" recorded. The low snowfall was probably a direct result of the higher than average temperatures during the winter months.

The water level on Karluk Lake, where the Refuge field headquarters is located, was again exceptionally high this fall. In fact it was lapping at the steps of the field camp entrance. The availability of beach-spawned salmon in Karluk Lake and other refuge lakes was decreased for bears because of the extreme high waters. However the high escapement for all salmon systems on the refuge this year provided an abundance of salmon for bears and other wildlife species dependent upon them.

The warm fall and winter temperatures and lack of snow produced ideal conditions for wintering deer populations. These same conditions, coupled with the rain and foggy weather, delayed bear hibernation, in some cases until late January and February.

Karluk and all major lakes remained ice-free at the end of the year. Many smaller lakes which froze in early December had ice break-up occurring again in late December when heavy rains and warm temperatures prevailed.

C. Land Acquisition

1. Fee Title

No active land acquisition programs were proposed. A land acquisition submittal package was proposed, however, which recommended the trade, exchange, lease, or purchase of approximately 138,000 acres of native selected lands, purchase of twenty-seven patented inholdings totalling 580.89 acres and acquisition (withdrawal) of 337,300 acres of BLM lands.

2. Easements

Not applicable

3. Other

ANCSA

The certified villages adjacent to the Kodiak NWR were conveyed large portions of their selected land in 1978. Each of the five villages is entitled to select 69,120 acres from the Refuge. The following acreages have been conveyed as of year end 1978:

Old Harbor.	34,960
Akhiok.	55,341
Kaquyak	5,944
Larsen Bay.	63,305
Karluk.	49,034

Total: 208,584 acres

Headquarters Site

The master plan for Kodiak suggested the planned headquarters - shop, storage buildings, plane hangar-water ramp, and other administrative facilities be constructed on Near Island adjacent to the city of Kodiak. The FWS for several years maintained a yearly option on a tract of land on Near Island from the Kodiak Island Borough on which to construct the facilities. Several past attempts to acquire funding for the facilities were made, including special legislation by State Senator Ted Stevens. The Borough, in 1975, dropped our option on the land for their future use as an expansion site for the city of Kodiak. Passage of the BLHP Act, and subsequent funding for the facilities development left the Refuge without a parcel of land in Kodiak on which to place the facilities. The existing administrative lot in Kodiak, although well located, had been so drastically reduced in size by the construction of a city street across the front and a State highway across the rear of the lot that future

construction was prevented. Other property which FWS at one time controlled in Kodiak, inherited from the Alaska Game Commission in the early forties, had long since been relinquished to BLM for transfer to the city and borough of Kodiak. The ANCSA further complicated the local land situation by essentially freezing all available BLM land surrounding the city of Kodiak for selection by Native villages and the Koniag Regional Corporation.

The city of Kodiak and the Kodiak Island Borough were petitioned for a tract of land, but none was available. In addition, no private property existed of a size to construct the facilities in Kodiak. The only alternative left was to approach the U.S. Coast Guard, who had several thousand acres of land adjacent to Kodiak on the Kodiak Coast Guard Support Center. After several contacts and meetings we learned they had just relinquished several hundred acres of Support Center lands back to BLM as excess to their needs. We immediately prepared a land withdrawal for a portion of the Support Center relinquished lands, but it was rejected by the Under Secretary of the Interior because Koniag Native Regional Corporation had indicated an interest in the lands. Koniag, subsequently, filed for, and is being conveyed, the lands. We then went back to the Coast Guard with our plight and have tentatively been approved a site on which to construct a portion of the facilities under long-term lease. It has been a long time-consuming and frustrating process, particularly so when just 25 miles away we own nearly 2 million acres, two-thirds of the entire island. We very seriously considered a very remote headquarters site!

D. System Status

1. Objectives

Refuge objectives were prepared for Kodiak NWR in 1971-72. Since that time, although we still prepare monthly, quarterly, and annual PPBE reports, the PPBE process has been somewhat lost to the new and changing PFMIS system. The two systems, PPBE and PFMIS, have become almost non-related and no mesh of financial cost coding can be used to track or directly relate to the PPBE system.

The objective setting process is in dire need of updating because of changing land status, goals and objectives, re-defined, changed, and combined outposts, and the test of time. We receive an occasional reference to the fact that the PPBE system will soon be updated and instructions prepared for the review and updating of Station objectives but this has, to date, failed to materialize.

2. Funding

Table # 2 presents the funding and manpower status of the Refuge over the past five years. It becomes readily apparent from reference to the table that things are improving, both in funds and manpower. These improvements have been directly the result of the Bicentennial Land Heritage program.

Table 2. Funds and Manpower Patterns - FY 1975 through 1979*

FISCAL YEAR	1975	1976	1976TQ	1977	1978	1979
PFT Manpower ¹	4	4	4	4	5	5
PPT Manpower	1	3	3	1	1	1
Career Seasonal				0	2	3
Temporary	2	2	2	0	2	2
MNMB	97,000	95,000	22,000	131,000	181,400	180,000
MB	21,000	26,000	2,000	31,000	42,000	87,000
I&R	13,000	16,000	7,000	12,000	40,000	40,000
Total Operation	131,000	137,000	31,000	174,000	263,400	257,000
Rehabilitation				83,000		28,000
Construction						786,000
Grand Total	131,000	137,000	31,000	257,000	263,400	1,071,000

* One of the three career-seasonal employees was not hired at time of report preparation but the position had been advertised. The two temporary employees likewise were not hired at time of report.

The increase of one PFT position listed in 1978 and 1979 was an additional BLHP position ceiling for a Refuge Manager Trainee. All other personnel increases have been through the use of part-time and career-seasonal appointments.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

Construction of a new 1,250 square foot, 3-bedroom residence was completed in late March. The \$ 82,222.77 funding was special BLHP Rehabilitation funds received during FY 1977. The house was constructed on the FWS administrative lot located at 511 Mission Road in Kodiak. The 3-bedroom (double car garage) house was constructed of pre-fabricated 3" cedar planking. Exterior walls were studded out, insulated, and the interior walls covered with matching 1" cedar planking, making a total wall thickness of nearly 8". It is probably one of the best constructed houses in the city, and also one of the finest. New Assistant Manager Mike Vivion arrived just in time to take up residency in the new quarters.

A portion of the same BLHP funds were used to purchase a new 19' Zodiac inflatable boat. The boat proved a valuable asset in checking setnet sites on the southwestern end of the island, as the boat, personnel, and gear would all make one plane charter load. A new 21' Boston Whaler, trailer, and 175 hp outboard ordered during FY 1977 was received. The boat, complete with flying top and forward sleeping berths, proved ideal in good weather, to safely navigate from the city of Kodiak to the opposite end of the island, some 90 miles distant, for patrol and commercial cabin compliance checks. Even in ideal weather, however, 8-10 foot seas were experienced passing around exposed peninsulas to reach protected bays and inlets. A 17' Boston Whaler was purchased and it was transported to Karluk Lake by the U. S. Coast Guard to replace an old wooden skiff for use in field research, surveys, and patrol work.

A 48' wooden sea-going motor vessel was acquired excess property from the Federal Aviation Administration (FAA). The boat was originally built sometime around 1932 as a salmon purse seiner. The old Civil Aeronautical Administration (CAA) purchased the boat around 1940-1942. It was used to carry supplies and materials to Shuyak Island, approximately 80 miles from Kodiak, in support of air navigational aids. Since the early 1960's the boat has been used by the FAA to ferry personnel and materials to Woody Island, near Kodiak. We had the vessel dry-docked in Kodiak in late summer for extensive modernizing. The following repairs or alterations were completed:

- 1) entire bottom planking was sounded, 9 new planks installed, all planks redrilled and renailed, and bottom caulked.
- 2) removed waterline ironbark and replaced rear dock bumper guard
- 3) entire boat scraped, sanded, and painted.
- 4) prefabricated flying bridge was installed.
- 5) new hydraulic steering (two-station - cabin and bridge) installed to replace the old single station cable and chain steering.
- 6) new aluminum fuel and water tanks were fabricated and installed.
- 7) old radar removed and replaced with new 24-mile radar unit

- 8) new HF and UHF radios and antenna were installed
- 9) entire interior of cabin and galley were rebuilt and painted and new cooking stove installed.
- 10) new digital fathometer, hydraulic winch, and 125 hp after-blown diesel were received.

Six new outboard motors (2 - 15hp, 2 - 25hp, 2 - 35hp) were purchased to replace our late 1950 and early 1960 vintage motors.

A new HF radio and antenna were installed in the Refuge office to replace an antiquated system which required a phone call to the Coast Guard Base to turn our old radio on (the old radio was located in their radio building on the Base) and then a wait of an hour for it to warm up, then another phone call to tell them it wasn't working, and then, and only if we were lucky, the remote unit in the office would key the system for transmission. Needless to say, few radio schedules were met. An identical new HF radio and antenna were installed in Quarters # 1 to provide after-hour communications with remote field camps. New radio antenna masts and antenna located at the Karluk Lake field headquarters were partially completed.

A new Plymouth station wagon on order from GSA for two years was received in August.

A new chain-link fence was installed around three sides of the Refuge administrative lot, located at 511 Mission Road. In addition dividing yard fences were installed between Quarters # 1, # 2, and the house trailer pad.

The following Real Property items were acquired by a transfer of property from the National Marine Fisheries Service. The facilities are all located on Camp Island, of Karluk Lake:

- 1) combination laboratory and living quarters (28' x 50')
- 2) residence building (29' x 32')
- 3) boathouse/warehouse shop (24' x 36')
- 4) generator shed (10' x 15')

The following cabins were "acquired" and added to our Real Property. They were added to the station's Public Recreational Cabin System.

- 1) Red Lake Bear Guide cabin
- 2) Frazer Lake Bear Guide cabin
- 3) O'Malley Lake Bear Guide cabin
- 4) Little River Lake Bear Guide cabin
- 5) Uganik Lake Bear Guide cabin

Cabins 1,2, and 3 have priority use by bear guides Bill Pinell and Morris Talifson during the bear hunt season only. They are required to tell us what dates they want the cabins and the remaining dates during the bear hunt season are available for the public.

Cabin 3 has no priority use and is FWS owned without restrictions. Cabin 5 has priority use by Guide Wayne Hans during the spring season only, and only for the next four years.

B. Maintenance

Recreational Cabins

Uganik Island cabins: Exterior stained, interior painted, new Sears oil stove installed, complete with new stainless stove pipe, metal floor base and 55 gallon fuel drum. Two complete 21' boat loads of trash were bagged and removed - the first time in the past several years. Karluk Lake outlet cabin: Exterior stained and trim painted, new oil stove carburetor installed and all trash accumulations removed. Outhouse was repitted and wired down to prevent wind damage. Karluk River (Portage) cabin: Exterior stained, new Sears oil stove installed with new stove pipe and 55 gallon fuel drum.

Administrative Buildings

Karluk River (Portage): Exterior stained and trim and interior painted. Camp Island facilities: Exterior stained and trim painted of all six buildings and several outbuildings and shack, new asphalt roof installed on main laboratory - dormitory building. Interiors were painted on three of the buildings. Fuel rack was constructed and stained at float plane ramp. After a fire in the main panabode residence building a new suspended ceiling was installed. Lots of old rubbish, rotten skiff and lumber, and old generator shack were burned. All weeds and brush which had accumulated around the building perimeter were removed. Shop and storage building (Kodiak): The exterior of both buildings were stained and trim painted. Overhead shop door was recovered with plywood.

Quarters

The following work was accomplished on quarters # 1, occupied by Native Liaison Specialist Mike Rearden:

- 1) All exterior walls were insulated by applying rigid foam insulation to the inside of the exterior walls, then applying a heavy plastic vapor barrier and $\frac{1}{2}$ " sheetrock.
- 2) All ceilings were covered with plastic vapor barrier and $\frac{1}{2}$ " sheetrock.
- 3) The complete interior of the house was repainted.
- 4) New ceiling light fixtures were installed and most electric switches and outlet covers were replaced.
- 5) New kitchen cabinets and kitchen sink and plumbing were installed.
- 6) New carpeting was installed throughout house with exception of front entrance, kitchen-dining room, utility room and bathroom, where new linoleum was installed.
- 7) New bathroom commode, sliding glass shower doors, and tub-

shower wall coverings were replaced.

- 8) The 1000+ gallon fuel tank was removed from the wooden stand in the rear of the house, tarred, and buried at right front of house with new copper fuel lines.
- 9) New 220 volt clothes dryer was installed in utility room
- 10) Entire exterior of house was recovered with 1" x 8" native spruce siding.
- 11) New curtains were installed throughout the house
- 12) New book shelf (free standing) was installed in living room

Grounds Improvement and Clean-up

Three old rotten Bureau of Commercial Fisheries weir cabin buildings and boat shed were burned at the Karluk River, outlet at Karluk Lake. All unburied metal was flattened and then hauled out by plane, or buried.

An old unused and delapidated cabin along the shoreline of Uyak Bay was burned.

The entire administrative lot in Kodiak was contoured for drainage by a bulldozer, and seeded. Drainage tile was installed, rock fill placed and a gravel driveway constructed to the newly constructed quarters # 2. The entire administrative lot was surveyed and permanent corner markers installed.

III. HABITAT MANAGEMENT

Kodiak NWR is essentially managed as a de facto wilderness in its entirety. Management activities are aimed, primarily, at protecting existing habitat values rather than using manipulative methods to improve or develop habitat.

- A. Croplands - not applicable.
- B. Grasslands - not applicable.
- C. Wetlands - nothing significant to report.
- D. Forestlands - not applicable.
- E. Other Habitat

Construction of an addition to the Frazer Falls steep pass fishway was completed in late 1978 by the Alaska Department of Fish and Game's Fisheries Rehabilitation Enhancement & Development Division (FRED).

Prior to 1962 Frazer Falls provided an effective natural barrier to upstream movement of salmon. In 1962 a steep pass fishway was constructed by ADF&G to allow sockeye salmon to move above the falls, thus opening virtually all of Frazer Lake and its tributary streams

to sockeye spawning.

The 1978 escapement through the Frazer fishpass was 142,200 sockeye. The addition installed this year will effectively double the capacity of the fishway. No further developments are planned at this time. A yearly tabulation of fish runs in the Frazer system appears in the 1976 Narrative Report.

On March 10, 1978 the Refuge staff met with ADF&G FRED Division personnel to discuss FRED's sockeye rehabilitation proposal for Upper Thumb River, near Karluk Lake. At the meeting FRED biologists presented a proposal for refuge review which included a hatchery facility at Camp Island, Karluk Lake, plus a major rehabilitation effort to be conducted in the 1978 field season. FRED personnel requested that we review the proposal (this was the first time refuge personnel had seen the proposal) and have our response prepared for them by the following Monday, March 13. The short time frame was necessary, they said, because they had to prepare for construction of the hatchery. In short, our response was that we would not permit such a major proposal without a thorough review.

After several meetings with FRED a review by Refuge and Alaska Area office personnel, the proposal for 1978 was approved on July 14 as a much-reduced contingency plan. The contingency plan excluded the construction of a hatchery at Karluk Lake and severely reduced the number of eggs to be taken for hatchery incubation. It also prohibited discreet subsystem stock mixing. Eggs were to be flown to Kitoi or Devil's Creek hatcheries for incubation to the eyed-egg stage, then flown back to Upper Thumb for planting.

At present we do not plan to permit the construction of a hatchery at Camp Island.

F. Wilderness and Special Areas

A proposal to construct a hydroelectric project at Terror Lake included a small dam and diversion near Mt. Glottof glacier, which lies within the Mt. Glottof Research Natural Area. The Anchorage office of Ecological Services was informed that developments are not permissible within this area. Ecological Services is preparing the FWS response to the hydroelectric project proposal.

G. Easements for Waterfowl Management

Not applicable.

IV. WILDLIFE

A. Endangered and/or Threatened Species

The only endangered species known to occur at Kodiak is the tundra peregrine falcon. This bird is listed as an occasional visitor.



Fish Pass ladder installed by the Fisheries Rehabilitation and Enhancement Division of the Alaska Department of Fish & Game, located on the Dog Salmon River below Frazer Lake. The double right side portion of the pass was constructed during 1962 and has resulted in the development of a sockeye salmon run into Frazer Lake. The double left portion of the pass was completed in 1978 to allow the passage of additional salmon to fully utilize the Frazer Lake spawning system.



Typical mid-elevation habitat over much of the refuge depicting the transition from high brush to the alpine habitat which is important early season bear foraging areas.



Wet tundra - high brush habitat fairly typical of the western portion of the refuge.



Riverine habitat typical of most of the northwestern streams. The Refuge has a network of water systems which yearly supports 4-7 million spawning salmon of all five North Pacific species. The spawning salmon represents the key species in an intricate ecosystem upon which reliance of almost all refuge wildlife is tied, particularly the brown bear and bald eagle.



Mike Rearden piloting FWS supercub 720 through one of the many mountain passes which provide a network of transportation corridors below the ever enduring low clouds and fog which envelopes the island. Almost all transportation to, from, and within the refuge is by plane.

It is likely that nearly all of the few peregrines that visit Kodiak are the Peale's subspecies, which is not listed as endangered.

B. Migratory Birds

Introduction

Information for this section has been severely curtailed in past years due to lack of proper equipment to conduct surveys and a limited number of personnel. A draft migratory bird management plan was completed this year and should be implemented in FY 79 which should give much needed data in this area. Kodiak National Wildlife Refuge's recent acquisition of the M/V Ursa Major and increases in refuge staff should further implementation of the management plan.

Waterfowl

Numerous sightings of whistling swans were made this year on the Karluk River, between Portage and the Karluk Lake outlet. In recent years whistling swans have been sighted in this vicinity every month of the year. This year was no exception, as confirmed by ADF&G employee, Peter Robb, who is stationed at Camp Island, on Karluk Lake. Peter saw whistling swans on the open water of the Karluk River and lake throughout the winter months of 1978.

On October 11, 64 swans were counted on this section of river. In light of these frequent winter sightings it has been speculated that we may have an essentially non-migrating population of whistling swans. We are not sure to what extent this behavior is followed by the rest of the breeding population on the Kodiak National Wildlife Refuge, but obviously at least a portion of the flock does winter on the refuge.

Pilot Mike Rearden, while conducting an aerial reindeer survey, reported seeing approximately 1500 emperor geese and several hundred ducks in the Sukhoi Lagoon on the 21st of September.

Constant flights of duck (widgeon, goldeneye, gadwall, mergansers, bufflehead, and mallards) were observed stopping on the Karluk River above Portage throughout the fall (until Oct. 26). These flocks seldom numbered above 40 individuals per flight, with stop-over time being a day or less in nearly all instances. Lesser scaup and harlequin ducks in small rafts of 10 to 20 birds, along with approximately 400 old squaw ducks have been seen in the Kodiak harbor channel during November and December.

Flocks of migrating geese (mixed species) were noted flying high over the Portage field camp (Karluk River) the last week of September. None were seen on the river while field personnel



Extensive colonies of marine birds such as these gulls nest along the Refuge coastal shores and near-shore rocks. They have been the subject of extensive inventory work during the past two years by the Office of Biological Services. Refuge personnel will be initiating yearly survey and inventory routes to monitor these populations during 1979. Large tracts of offshore oil sale leases are currently pending which could have important impact on these birds in the future.

were present (until Oct. 26). Apparently the area is not as attractive for resting and feeding by migrating geese as it is to migrating ducks and whistling swans.

Marsh and Water Birds

Lack of previous funding, equipment, personnel, etc. has left a noticeable gap in the data concerning population conditions of these species on the Kodiak National Wildlife Refuge. Implementation of the proposed migratory bird management plan should supply much needed data about a large segment of the refuge avian population which has been neglected for some time.

Shorebirds, Gulls, Terns, etc.

Proposed off-shore oil development has prompted OBS-CE to conduct cursory surveys of marine birds. These have been conducted sporadically with collection of only general information. Through the MBMP baseline quantitative data will be forthcoming and should give a much clearer picture of these species numbers, movements, habitat requirements, etc.

Raptors

The annual bald eagle nesting survey was flown June 1 over Spiridon Bay, Zachar Bay, Uyak Bay, Larsen Bay, and Karluk Lake drainage. A total of 57 active nests was found and mapped. On August 17 48 (87 percent) of spring active nests were rechecked to determine productivity. Only 23 (48 percent) of the 48 spring active nests contained 27 young for an average productivity of 1.2 young per nest. This compares with 1.61 young per successful nest in 1977. The apparent decline in productivity may be due in part to the lateness of the 1978 fall survey, as it appeared many of the nests had been recently vacated. This would give a depressed figure for nesting productivity.

A November 2 survey by boat was made along the shore of Karluk Lake, resulting in a tally of 15 sub-adult and 35 adult bald eagles.

ADF&G employee, Peter Robb (Camp Island, Karluk Lake) stated that there appears to be a large concentration of eagles on Karluk Lake annually during the last week of October. In past years as many as 120 eagles were seen, using the same survey method. Though he had not counted this year he was convinced that there was a much smaller number of eagles present this year than previous years. The 1978 nesting productivity decline may have other factors, besides the late timing of the fall survey, responsible for the decrease. The upcoming breeding season will get special monitoring to pinpoint this and other points of concern.

On May 12 a bald eagle was ingested by a Wien Air 737 jet,



Apparently all nesting pairs of Bald Eagles reside on the Refuge, scattered along the extensive coastal shoreline and inland lake systems. The Refuge eagle population has remained stable throughout the long period of population inventories which began in the early 1950's. Their off-refuge winter migratory habits are not thoroughly known and will be the object of future research.

resulting in total engine failure. The tidal area in front of runway No. 25 approach is extensively used by eagles and gulls for a feeding area. Refuge personnel have accompanied Mr. Gil Jarvela (State airport manager) on several occasions to observe the potential aircraft hazard these birds cause. Mr. Jarvela applied for a hazing permit after the eagle ingestion in an attempt to reduce their activities near the runway approach before incoming flights arrive. A kill permit was issued January 23 by U. S. Fish and Wildlife Law Enforcement, to alleviate the gull concentrations. These measures are at best a temporary solution. A permanent remedy is not visible at this time, as neither the feeding area nor the airport will move or change. Additional bird-aircraft problems are sure to arise in the future.

Other Migratory Birds

A mourning dove was sighted during October on Camp Island (Karluk Lake) by ADF&G employee, Peter Robb. This is the second reported sighting of a mourning dove on the refuge, the first having been recorded in the early 60's.

Several pair of parasitic Jaegers successfully nested in the Portage area on the Karluk River.

A great blue heron was reportedly sighted in the Larsen Bay area several times after January. It is not known whether the heron survived the entire winter.

Starling have finally arrived in Kodiak. Five of the birds have been observed at the Kodiak airport on several occasions, a new record for the island. To date none have been observed on the refuge.

Table 3. Bald Eagle Mortalities - 1978

<u>Cause</u>	<u>Number</u>
Possible gunshot.	2
Starvation.	1
Unknown disease	1
Unknown violation	1
	<hr/>
Total	5

C. Mammals and Non-Migratory Birds

1. Game Mammals

a) Alaska Brown Bear

A comprehensive brown bear management plan is now being

prepared to address both past history as well as the future aims of brown bear management on Kodiak.

Though no ongoing studies on brown bear are currently being pursued, at least two will be proposed in the management plan, and field work may commence in 1979. The first of these would involve improving census techniques and the second involves visually marking a sample of bears to determine both movements and distribution of the hunter harvest.

Population Surveys

Aerial alpine surveys were conducted using a chartered Bellanca Scout and were conducted between July 25 and 28, 1978. Results of this survey are given in Table 4. A total of five hours survey time was flown this year on the alpine survey. Two counts were made of the Uganik transect, only one of the Uyak transect.

Aerial stream surveys were conducted, using N720, a FWS supercub, on July 27, 28, and August 15, 1978. Results of these counts are shown in Table 5. Three counts each were made on Sturgeon, Red, Connecticut, Pinnell, and Dog Salmon creels transects.

At this time our feeling is that aerial composition counts as they have been conducted at Kodiak are of limited use, at least without considerable reanalysis of past data. We are at present attempting to thoroughly analyze past data, and in 1979 will attempt to ground-truth at least some of the aerial surveys with observers on selected stream transects. We feel that the alpine surveys are reasonably accurate as is but that the stream counts need further examination. A study plan is being written, aimed at refining these surveys if possible. Work also continues on determining the best means to statistically analyze the survey data.

Mortality

Harvest data is probably the most precise information on the brown bear population as a whole that we have available to us. Unfortunately these data are after-the-fact and can only indicate changes that have already occurred in the population. This can be a bad situation when dealing with a species characterized by a long life span and low reproductive potential such as the brown bear. Once a change has taken place it will take a considerable length of time to correct.

A compilation of past mortality records is now in progress. Once this data is compiled we plan to apply various statistical tests to hopefully detect any trends that have occurred and try to correlate these to other management data, specifically survey information. The significance of many statistical tests suffers somewhat from the relatively limited sample size characteristic of these data.

Table 6 displays average ages and skull sizes of brown bears harvested on the refuge in 1978. These figures contain all known mortalities for the year. Sample sizes vary due to broken skulls in some cases and skulls not retrieved (no tooth available for aging) or poor annulation in sample teeth.

The total refuge kill of 106 bears is not in excess of management guidelines. However the kill in certain subunits, particularly subunit IV - Southwest Kodiak, the established sustained a higher kill than optimum harvest for this area. Roger Smith (ADF&G Unit 8 game biologist) has proposed a reduction in the number of permits for this area to the Game Board. ADF&G has been informed by the refuge staff that if this excessive harvest is allowed to continue FWS will establish closed areas as necessary to rectify the problem.

Non-Sport Kill

Two bears were killed in defense of life and property in 1978 on refuge lands. Five others were shot in defense just off refuge lands.

A female with three cubs of the year attacked Al Crattie, Jr. a Kodiak resident, on refuge lands near Old Harbor on November 2, 1978. Crattie's companion shot and killed the sow before Crattie was seriously injured. Crattie suffered relatively minor cuts and bruises. This was only the fourth documented mauling in Kodiak NWR history. None of the four resulted in serious human injury. Weather conditions hampered search for the bear's carcass which was not found. Both men involved in the incident were certain that the bear was dead, however. It must be presumed that the three cubs also died, since survival in the wild from this age is unlikely.

One bear was shot in defense by bear hunters near the head of Terror Bay in late October. The two hunters claimed they had just shot two bears and were skinning them when a third bear charged them.

Two bears were shot by construction workers near Karluk village, in early October. This instance occurred off Refuge lands. Circumstances of the incident are not known.



Kodiak's Claim to Fame. The huge Kodiak brown bear numbering approximately 2000 on the island has maintained relatively stable population throughout the history of refuge management. The refuge is currently rewriting its Brown Bear Management Plan to refine annual survey techniques and expand our research efforts on this magnificent creature.

Two bears were shot near Port Lions in October. Again these kills occurred off refuge lands.

One bear was shot by a deer hunter near Eagle Harbor, about 15 miles from the refuge boundary, in November.

Reindeer

Reindeer were introduced to Kodiak Island in 1924 for husbandry purposes. Active herding ceased in 1939 or 1940, and the last grazing lease expired in 1964. Since 1962 ADF&G has published regulations listing Kodiak reindeer as game animals, with no closed season and no bag limit.

An apparent decline in total numbers has occurred since the herd became feral. When herding stopped approximately 1500 head ranged the southwest end of the island. A survey in 1957 tallied 740 head; a very thorough aerial survey in 1963 tallied 768 head, and another in 1965 counted 553. From limited surveys in 1977 ADF&G estimated total population size to be a maximum of 250 animals.

On September 21, 1978 refuge personnel conducted an aerial survey of the southwest end of Kodiak Island via N-720. A total of 129 reindeer was counted, all in the northernmost portion of their range, between Halibut Bay and Grant Lagoon. Although a thorough composition count was not possible a very few calves were seen, and of the 64 animals classified half were mature bulls.

At least seven reindeer were shot by hunters in 1978, four of which were examined by refuge personnel. All four appeared healthy and showed normal fat deposition. No tissue samples were taken, however. ADF&G estimates total hunter harvest to be no more than 25 animals per year.

At present we do not have sufficient information to determine the cause of the decline in reindeer numbers. It is likely that inbreeding and the loss of adaptability of a semi-domesticated strain are the primary causes of the decline. Hunting, predation by bears, and possibly disease are other factors affecting the population.

Table 4. Aerial Alpine Composition Surveys - 1978*

Class	Number	Percent of Total
Single Bear	40	29
Sow w/1 cub	4	3
Sow w/2 cubs	11	8
Sow w/3 cubs	6	4
Total cubs of year	44	32
Sow w/1 yrl.	0	0
Sow w/2 yrsl.	4	3
Sow w/3 yrsl.	4	3
Sow w/4 yrsl.	1	1
Total yrsl.	24	17
Total bears	138	100%

Avg. litter size - COY = 2.1

Avg. litter size - yrl. = 2.7

* Include two counts of Uganik transect, one of Uyak transect.

Table 5. Aerial Stream Composition Surveys - 1978*

Class	Number	Percent of Total
Single bear	63	44
Sow w/1 cub	1	1
Sow w/2 cubs	6	4
Sow w/3 cubs	3	2
Total cubs of year	22	15
Sow w/1 yrl.	4	3
Sow w/2yrsl.	7	5
Sow w/3 yrsl.	5	3
Total yrsl.	33	23
Total bears	144	100%

Avg. litter size - COY= 2.2

Avg. litter size - yrl. = 2.06

*Includes 3 counts each of the following streams: Sturgeon, Pinnell, Frazer-Red, Connecticut, Dog Salmon.

Table 6. Average Ages and Skull Sizes of Brown Bears
Harvested on Kodiak NWR - Calendar Year 1978

		<u>Males</u>	
	<u>Age in years*</u>		<u>Skull Size**</u>
Spring.	7.4 (48).		24.06 (47)
Fall.	6.1 (15).		22.93 (14)
Total.	6.75 (63).		23.50 (61)
		<u>Females</u>	
	<u>Age in years*</u>		<u>Skull Size **</u>
Spring.	6.6 (30).		21.19 (29)
Fall.	6.2 (13).		21.56 (12)
Total.	6.4 (43).		21.38 (41)

* Determined by cementum annulations from premolars

** Length plus width in inches
(Numbers in parentheses indicate sample size)

Mountain Goat

Goats were introduced to Kodiak Island in 1952 and 1953 when a total of nineteen animals were released at Hidden Basin, just east of the refuge boundary. The species has established itself and current population estimates range between 200 and 250 animals. Most of these animals occur just off refuge lands near the original release site, but isolated small bands appear to be pioneering westward on refuge lands. Two goats were observed on a ridge above the east side of Uyak Bay during the alpine bear survey on July 25, 1978.

On August 15 through August 17, 1978 a cooperative goat survey was conducted by ADF&G, and refuge personnel. A Bell 206-B helicopter was used for aerial counts of separate drainages each morning. After each morning count the helicopter dropped off the two observers within 1½ to 2 miles of the largest band of goats seen. The observers then hiked to within 100 to 500 yards of the goats and conducted a ground classification count and camped overnight in the area, where the helicopter picked them up the next day to conduct further counts. This appears to be a relatively efficient and safe means of surveying goats, with a total of three hours aerial survey time and six total man days expended.

Total results of two ground composition counts are given in Table 7. Classification of adults and subadults to sex was based on horn characteristics, accompaniment by kids, urination posture and genitalia. Yearlings were classified by relative size and horn length.

The small number of adult males in composition counts is a factor of the nature of the count combined with the solitary nature of adult males, rather than a shortage of this age class in the population.

Combined results of the aerial counts are given in Table 8. This table includes the 78 animals classified from the ground.

Nine goats were taken by sport hunters in 1978, including at least one record-class billie. Table 9 gives a breakdown of hunter kill by age and sex. The sex and age distribution of the harvest (6 males, 3 females, mean age of 8 goats - 7.6 years) may indicate that hunters are actively selecting for older male animals, which has not been the case in past years.

Table 7. Mountain Goat Ground Composition Counts
Totals of 8/15/78 and 8/16/78 counts.

Sex & Age Class	Number	Percent of total
Female w/1 kid	14	18%
Female w/2 kids	3	4%
Kid	20	26%
Yearling	9	11%
Adult Male	2	2%
Male, 2-3 yr.	6	8%
Lone female, 2 yrs.+	3	4%
Unclassified	21	27%
Totals	78	100%

Table 8. Mountain Goat Aerial Counts - 8/15/78 - 8/17/78

Adult	Kid	Total	Kids per 100 Adult	% Kids
93	33	126	35/100	26%

Table 9. Kodiak Island Mountain Goat Harvest Data - 1978

Subunit	Date	Sex	Age
871	9/19/78	Male	10.5
871	9/19/78	Male	3.5
871	9/29/79	Male	7.5
871	9/29/79	Male	10.0
871	10/14/78	Female	None*
871	10/14/78	Female	4.5
872	9/10/78	Male	4.5
873	10/26/78	Male	9.5
874	9/30/78	Female	10.5

Average age of 8 goats = 7.6 years

* Horns broken - unable to age

Sitka Blacktail Deer

The past two winters (1976-77 and 77-78) were considerably milder than average and the 1978-79 winter appears to be shaping up as the third consecutive mild winter. The lack of snow at lower elevations and the consequent availability of winter forage, coupled with mild temperatures, has reduced winter mortality of deer on Kodiak to a negligible factor in these three winters.

The deer population has responded to this environmental circumstance by increasing in size and moving into previously unoccupied areas of the island.

Undoubtedly when a harsh winter does occur in future Kodiak will experience a major die-off of deer.

Although the results of State hunter surveys are not yet compiled the State estimates that 2000 to 2500 deer were taken by hunters in Game Management Unit 8 in 1978. Of these an estimated 1200 were taken on Kodiak National Wildlife Refuge.

2. Other Mammals

A. River Otter

Forty-six were reported taken by trappers on the refuge during the 1977-78 season. This decrease from previous years was probably a result of the Endangered Species Scientific Authority's temporary ban on exportation of otter and the subsequent drop in market value of otter hides as a result of the uncertainties of the market.

b) Red Fox

One hundred-twenty-one were reported taken by trappers. Though fox comprise the largest number of animals trapped of any one species this level of harvest undoubtedly has an insignificant impact on island fox populations.

c) Beaver

Fifteen were reported taken by trappers on the refuge.

Several dams were cut by ADF&G personnel to allow passage of salmon. As beaver continue to spread on the refuge they will undoubtedly have more impact on anadromous fish runs. At present no control action is planned, but an inventory plan is being prepared to assist in documenting the spread of beaver on the refuge.

d) Raccoon

This species was illegally introduced to Uyak Bay in 1974 by Park Munsey, a guide who lives in the area.

A permit was issued by ADF&G for Munsey to keep one neutered, tethered pet raccoon at his residence in Amook Pass. Obviously the animal was neither tethered or neutered, nor was it the only raccoon brought in by Munsey. We believe Munsey imported at least four animals to his patented land homesite which is a coastal inholding surrounded by refuge lands.

During the winter of 1977-78 at least four raccoons were caught by trappers in Uyak Bay. Sightings have been reported from Park's cannery (Whitney-Fidalgo Seafoods) on the east shore of Uyak to Carlsen Point at the mouth of Zachar Bay, indicating the animals have extended their range to cover most of Uyak Bay, the largest bay on the island.

A biological aide was sent to Munsey's camp on July 6, 1978 and remained there until July 23, 1978 in an attempt to trap, shoot, and record information on the raccoons in that area. Six separate sightings of raccoons were made of a probable total of 13 individual animals (sightings included two litters) within a three mile radius of Munsey's camp. None were killed, and trapping efforts were unsuccessful.

A trapper working in Uyak Bay in late 1978 reported twenty separate raccoon sightings. He made no attempt to kill them

since he believes raccoons could be a future source of fur for trappers once they become better established - a true conservationist.

At this point we agree with ADF&G personnel that raccoons are now well established on the island and any further attempts to eradicate raccoons from Kodiak completely would be fruitless. Raccoons are a very adaptable species and should (and obviously have) adapt well to Kodiak's mild climate and abundant food supply. We will continue to remove raccoons on an opportunistic basis and encourage trappers to kill them when possible. But no organized attempt to eradicate the species from Kodiak is planned at present.

The ultimate impacts of the introduction of this efficient predator will not be known for many years, if they are ever clearly understood. The only certainty is that there will be some impacts.

3. Resident Birds

Nothing of significance to report.

4. Other Wildlife

Anadromous Fish

In general the 1978 salmon runs for the Kodiak district (including the entire Kodiak Archipelago) were the best runs since Statehood.

Table 10 shows peak salmon escapements by species for Kodiak NWR streams. These figures are from ADF&G commercial fish division records. Counting techniques vary from stream to stream. Weir counts are used on Akalura, Upper Station, Dog Salmon (Frazer), Red (Ayakulik), and Karluk River systems. All other stream systems are counted from aircraft.

Table 10. Peak Salmon Escapement Counts - Kodiak NWR - 1978

	<u>Species</u>				
	Pink (Humpback)	Chum (Dog)	Red (Sockeye)	Coho (Silver)	King (Chinook)
Peak Escapement	4,051,489	311,762	855,809	20,341	14,677

Total of All Species - 5,254,078

Weir counts are essentially total escapement figures for the season, whereas aerial counts are rather conservative since they only count the number of fish in the stream at the peak

of the run.

The count for silvers is quite low since the peak of the silver runs occur late in the year after weir and stream counts have been discontinued.

Escapements by species for the Karluk system are shown in Table 11.

Table 11. Total Anadromous Fish Escapements - Karluk River - 1978

Pinks (Humpback)	Chum (Dog)	Species					Immigrant Steelhead
		Red (Sockeye)	Coho (Silver)	King (Chinook)	Steelhead Kelts		
1,380,792	32	360,935	12,089	9,795	1,052	948	

Though weir personnel tried to keep the weir in place until November pink salmon carcass accumulations forced removal of one-third of the weir on September 5, and the weir was replaced on September 25. Escapement estimates were made for this period based on 10 minute counts each hour from 6:00 am to 12:00 pm. For this reason totals for Immigrant steelhead and silver salmon may be somewhat in error. Totals for other species represent relatively accurate total escapements.

Although the early run of sockeye into Karluk met escapement goals for the first time in 25 years the late run did not. Many Karluk reds are caught incidental to the west-side pink fishery. This year the pinks were two to three weeks later than normal, and their runs coincided with the late Karluk reds. Reds caught incidental to the pink fishery are retained since the survival rate of fish caught and returned to the water is low. The total 1978 run of Karluk reds is estimated at 612,270, with a total catch for the Karluk and Uganik district of 251,335. As a result this year's late red run into the Upper Thumb River was virtually non-existent. ADF&G Comm. Fish Division is currently revising regulatory measures in an attempt to further protect late run Karluk red salmon.

The ADF&G Fisheries Rehabilitation, Enhancement, Development (FRED) Division initiated rehabilitation efforts on Upper Thumb River sockeye in 1978. During the last two weeks of July a total of 1030 female and 525 male sockeye were taken from the Upper Thumb River early run. These fish were artificially spawned, the eggs were fertilized and flown to the FRED hatchery at Devil's Creek, near Kodiak, for incubation to the eyed-egg stage. Eyed eggs were then flown back to Karluk Lake and planted above the

first falls on the east fork of the Upper Thumb River between September 13 and October 3.

A total of 2,583,660 eyed-eggs were planted in this phase of the 1978 operation.

Between September 6 and October 5, 1978 a total of 860 female and 473 male sockeye were taken from the Lower Thumb River late run. Similar procedures were used to process these eggs, except that these eggs were incubated at FRED's Kitoi Bay hatchery on Afognak Island. Eyed-eggs from this phase of the 1978 operation were planted in the east fork of the Upper Thumb River (above the falls) between October 10 and October 18. A total of 1,207,184 eggs were planted in this phase. All eyed-eggs were planted above the falls (impassable to wild salmon) to avoid disturbance to wild salmon redds and to permit separation for marking of hatchery and wild fry for later monitoring of differential mortality.

The 1979 operation for the Upper Thumb will closely parallel this year's operation both in procedures and number of eggs taken.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On-Refuge

The Refuge is very remote from the headquarters site in the municipality of Kodiak, and access is possible only by air or water so there are seldom any large concentrations of people. Therefore there are no formalized interpretive or information programs on refuge lands. Informally, when visitors are met on the refuge we conduct interpretive and informational activities on a one-to-one basis.

2. Off-Refuge

Most of our off-refuge information and interpretive activities were directed at the local community and the nearby Coast Guard base. Slide shows and movies were shown to the Coast Guard Officers' Club and the officers of the Air Station. The movies, "Kodiak, Island of Change" and "Chain of Life" were loaned out to several civic and church groups in Kodiak. Refuge personnel showed movies, slides, and gave talks in the Akhiok village school. Rearden, Native Liaison Specialist, worked for a week on the Clarence Rhode NWR, and Nunivak NWR showing a slide program on the West Coast Refuge tours, sponsored by the USFWS for a group of Eskimos from that area. He presented the program in the villages of Mekoryuk, Tununak, and Toksook Bay.

Several news releases from and about the Refuge were published. One, about a local citizen who was issued a permit to care for an injured bald eagle until capable of flight was written by the staff and published in local newspapers and Alaska magazine. Several other news releases generated by the refuge staff were published in local newspapers and Wildlife Update, a USFWS newsletter. A local reporter wrote an article about the recreational opportunities on the refuge, and about our newly-acquired-from-FAA 48-foot vessel, the Ursa Major, which is the second oldest vessel in the Kodiak boat harbor.

A new refuge leaflet describing the use of and recreational opportunities at the several public use cabins on the refuge was written and should be published by the spring of 1979.

Rearden spent four days in Anchorage aiding I&R people from the Area office and other refuges in providing a program to school children during Alaska Outdoor week.

Numerous brochures, posters, teaching aids, etc. were sent to the four village schools adjacent to the refuge.

B. Recreation

1. Wildlife Oriented

In 1978 the Refuge issued 12 trapping permits. Most trappers on the Refuge trap for the recreational values rather than commercial gain. Pelts on Kodiak Island are poor in quality compared to interior Alaska furs, due to the temperate climate. Therefore they do not bring the extraordinary prices other Alaska furs do. During 1978 six trappers harvested 121 fox, 15 beaver, and 46 river otter.

The brown bear hunting permit system is administered by the state of Alaska but we still receive a multitude of calls concerning bear hunting, cabin availability, and names of guides available to hunt on the Refuge.

Sitka black-tailed deer were introduced to Kodiak in the 1930's and today the island produces a very healthy population of them. The last two winters have been very mild and snow depth has been much less than previous years. Consequently the deer population has profited by it. Approximately 1200 deer were taken during August 1 to January 15 season. A limit of 4 deer of any sex is allowed.

The Karluk river system is where the greatest concentration of recreation occurs on the Refuge. In 1978 a creel census/public use survey was operated at the midway point of the river. The number of visitors increased considerably in 1978 which may be explained by three factors: (1) data was gathered continuously throughout the 1978 season. In previous years the Portage station

was not manned between the king salmon and the steelhead runs. (2) An increase in recreational enthusiasts who can afford the cost of visiting this area (note increase of out-of-state visitors), and (3) the spread of fishing fame of the Karluk River system must also be considered a plausible cause for the increase of visitors.

The percentage of both Alaska residents and people from Kodiak decreased by sixteen percent from the previous years, indicating increased use by out-of-state visitors. See Table 12. The percentage of people using the public recreational cabins has increased slightly along with the average party size. The average length of stay decreased slightly along with the percentage of military personnel visiting Portage.

A sizable increase in the number of total fish caught can be seen in both runs (king and steelhead), with a slight decrease in hours spent fishing for king salmon, and a two-fold increase in hours spent fishing for steelhead trout.

The catch-per-unit-effort showed a marked increase for both runs (king and steelhead) in regard to total fish caught. The catch-per-unit-effort for king salmon and total king salmon catch dropped off in comparison to 1977 but was higher than 1972. The catch-per-unit-effort for steelhead was lower than 1971 and 1972 but higher than 1977 when the main steelhead run was missed by the survey, while the total number of steelhead caught was higher than any of the previous years.

The percentage of king salmon retained increased from 1977 but was lower than 1972. The retention percentage for steelhead decreased from 1971 and 1972, with 1977 being considerably higher. See Table 13. This is mostly due to the small number of steelhead caught in 1977, and the premature cessation of the creel census. Generally, as the number of fish increase the percentage retained decreased. This is due in a large part to the lack of a proper means of storage of the catch at Portage, and the disposition of anglers to be fishing at Portage for enjoyment and not to fill the larder. More information on public use on the Karluk River is included under the section Field Investigation. The increase in number of fishermen and the increased popularity of the Karluk system has caused some side effects. The litter problem has become serious in several areas, and concentrations of fishermen at times results in a less than an esthetic situation for some. One group of 31 people caught 51 kings in one short span of the river in a day and a half, retaining all of them. They set up a canning operation in the recreation cabin and left with several cases of salmon. This type of operation in the midst of a prime sportfishing area shoulder-to-shoulder with the catch-and-release type fisherman tends to taint recreational management on the refuge. There was, however, nothing illegal about their activities.

We are considering establishing a permit system for this area of the refuge in order to assess recreational use and maintain control over the number of people using the river system.

Many wildlife photographers used our recreational cabins. There is a great interest in photographing brown bears and bald eagles on the refuge.

Table 12. Comparison of Public Use, 1972, 1977, and 1978

	<u>1972</u> ¹	<u>1977</u> ²	<u>1978</u> ³
Total No. of people	168	175	260
Percent Alaska resident	76	78	62
Percent Kodiak resident	54	40	24
Percent military personnel	22	13	7
Percent visitors using cabin	45	41	52
Average Length of stay	3.0 days	3.9 days	3.4 days
Average party size	3.5	3.8	4.4

1. Data for both king and steelhead fishermen with a 59-day lapse (8/4 to 10/2) where no data was collected.
2. Data for both king and steelhead fishermen with a 56-day lapse (7/18 to 9/11) where no data was collected.
3. Data collected continuously 6/10 to 10/26 with no lapse.

Table 13. Portage on Karluk River
Catch Composition June 10 to October 26, 1978

Species	Total No Caught	Percent of Total Catch	Number Retained	Percent Retained	Number Released	Percent Released
Dolly Varden	2420	70.5	142	5.9	2278	94.1
Steelhead Trout	357	10.4	63	17.6	294	82.4
King salmon	254	7.5	147	57.8	107	42.2
Coho salmon	187	5.4	51	27.3	136	72.7
Rainbow trout	137	4.0	20	14.6	117	85.4
Pink salmon	59	1.7	0	0.0	59	100.0
Red salmon	18	0.5	5	27.8	13	72.2
Totals	3432	100.0	428		3004	

2. Non-Wildlife

Numerous inquiries were made about the quality of hiking and camping on the Refuge by people unfamiliar with Kodiak Island. When informed as to the climatic variations present and the marginal hiking conditions found on the Refuge, many quickly opted for either a recreational cabin or an area other than Kodiak Island. The Karluk River, though noted for its excellent fishing, does get numbers of kayakers and rafters floating its course. This type of recreationist is usually present on the river in August between the chinook salmon spawning run and the steelhead trout season. The Karluk River is not a fast river and does not offer the challenge many other rivers on the Refuge could, if they were accessible.

The Larsen Bay ski club skied from Larsen Bay village to Karluk village during the last part of December. Cross-country skiing on the Refuge is not very popular due to the problem of access, poor snow conditions, or no snow at all. There is, however, potential for more of this activity around the villages during winters of heavy snowfall.

C. Enforcement

Law enforcement activities at Kodiak are almost totally dependent on aircraft or watercraft travel to remote areas on the refuge. Since the transfer of the motor vessel, Kodiak Bear II, to Ketchikan in 1973 we have not had any watercraft suitable for patrol work to the more remote areas of the island. In late 1977 we acquired a 21-foot Boston Whaler to provide fast, safe transportation around the island during summer months. In April of 1978 we acquired the 48-foot M/V Fedair IV from FAA, and a major rebuild is nearing completion on this boat, now renamed the Ursa Major. The Ursa Major will provide transportation and live-aboard capabilities on a year-round basis for both law enforcement and survey activities.

Inclement weather hampered law enforcement patrols during both the spring and fall bear hunts this year. In addition to aircraft patrols one refuge staff member accompanied State Wildlife Protection officers aboard the patrol vessel Trooper during the fall hunt, checking coastal bear camps.

Two patrols of the northwest side of Kodiak Island were made to check for compliance with refuge rules and regulations governing set-gillnet sites on refuge lands. The first patrol was in mid-June, the second in early August, and both were conducted in the 21-foot Boston Whaler. No citations were issued.

One patrol of set-net sites in the Olga-Moser Bays area was conducted in mid-August, using an outboard powered inflatable boat which was flown in to Olga Bay. One citation was issued to a set-net permittee for excessive litter at his site. Action is still pending on this case.

In early November a patrol flight over Uganik Island revealed considerable litter and personal property (fuel drums) at a setnet site. A citation was issued for litter and storage of personal property on refuge lands. Defendent forfeited bond.

Six violations were reported and documented by biological aides operating the Portage creel census. A listing of these violations and their disposition follows:

- 1) Coast Guard helicopter landing at Portage (violation of Refuge Special Use Regulations). Violation reported to local Air Station Commander for disciplinary action.
- 2) Destruction of government property (recreationists cut up construction materials for firewood). Reported to Coast Guard Air Station Commander for disciplinary action (Coast Guard personnel involved).
- 3) Fishing without license. Processed through State Magistrate's court. Plead guilty and paid \$ 50.00 fine.
- 4) Same as No. 3. Both 3 and 4 were non-residents accompanied by a local guide.
- 5) Attempt to take protected migratory bird (Gull) - forfeited bond.
- 6) Same as No. 5.

In addition evidence of several instances of littering were noted by Refuge personnel and personnel of ADF&G, but it was not possible to determine the identity of the violators.

Obviously the increasing public use of the Karluk River will require more intensive law enforcement activities in this area.

Several reports of violations of the Bald Eagle Act were received and investigated by refuge personnel. These cases are often based on hearsay and are at best extremely difficult to prosecute. The owner/skipper of the F/V Icy Strait was cited for possession of bald eagle parts after a telephone complaint by a local citizen. The case was still pending at year's end.

Undoubtedly many violations of the Bald Eagle Act and Migratory Bird Treaty Act occur but go undetected in the Kodiak area, primarily due to the difficulty of covering such a large area, with fishing boats ranging the entire coastline in large numbers.

VI. OTHER ITEMS

A. Field Investigations

Portage Creel Census

A creel census was conducted from June 10 to October 26 at Portage, on the Karluk River by refuge employees. Fishermen were inter-

viewed at the end of each fishing day to determine the exact amount of time spent fishing; also number and species composition of the catch.

Scale samples, sex, weight and length measurements were taken from Chinook salmon, sockeye salmon, coho salmon, rainbow trout, and steelhead trout. Data were collected from as many retained and released fish as possible. Species structure varied with the spawning run occurring at any given time.

Chinook salmon anglers caught a total of 254 chinooks in 1485 man-hours, for a success rate of 0.17 chinook salmon per hour of unit effort. The best chinook fishing took place the first two weeks of July. During this period chinook made up approximately three-quarters of the total fish caught. The average chinook fisherman fished 3.95 hours per day from June 10 to September 4.

Steelhead anglers caught a total of 355 steelhead trout in 1083.5 hours of fishing for an overall success rate of 0.33 steelhead per hour of effort. Eighty-two percent (292) of these were released back into the river. The peak run had not been reached at Portage when the creel census ended October 26. The average steelhead trout angler spent 3.62 hours per day fishing from September 5 to October 26.

Generally all other fish caught are incidental to the pursuit of chinook salmon or steelhead trout. Data were compared to previous years when similar surveys were conducted at Portage (Tables 14 and 15) to denote changing fishing pressure. Surveys were conducted in cooperation with ADF&G chinook salmon studies and steelhead trout tagging - recovery program which is used in population, age structure, and rate growth determination (Tables 16 & 17).

Karluk Salmon Studies

Dick Wilmot, of Fisheries Research Division, Anchorage office, conducted a study of the genetics of sockeye salmon in the Karluk Lake system, with primary emphasis on the Thumb River. Although the data were somewhat clouded due to the timing of samples, preliminary results indicate there is little, if any, genetic difference between Upper and Lower Thumb River sockeye. The purpose of this work is to determine whether it would be biologically sound to utilize Lower Thumb stocks of fish to rehabilitate the severely depleted Upper Thumb runs. Further tests will continue in 1979.

Rowan Gould, of Fisheries Research, in Seattle, conducted disease studies of anadromous fish of the Karluk system in 1978. Part of the aim of these studies is to isolate the causative agent involved in the high prespawning mortality rate characteristic of Upper Thumb River sockeye. Results of the 1978 field season work have not yet been finalized. One incidental finding was the incidence of IHNV (Infectious Hematopoietic Necrosis Virus) in Karluk king

Table 14. Comparison of Creel Census Data for king salmon anglers 1972, 1977, & 1978

	<u>1972</u>	<u>1977</u>	<u>1978</u>
Total hours spent fishing.	1256	1576.5	1485
Total fish caught.	235	458	558
Number per hour.	0.19	0.29	0.34
Total king salmon caught	170	341	254
Number per hour.	0.14	0.22	0.17
Percent retained	72	44	58

Table 15. Comparison of Creel Census Data for Steelhead anglers for 1971, 1972, 1977 and 1978

	<u>1971</u>	<u>1972</u>	<u>1977¹</u>	<u>1978</u>
Total hours spent fishing.	275	213.5	545.25	1083.5
Total number fish caught	395	506	829	2904
No. per hour	1.4	2.4	1.5	2.7
Total steelhead catch.	173	320	42	355
No. per hour	0.63	01.5	0.08	0.33
Percent retained	32	26	48	18

1. Creel census ended on 10/10/77, too early to catch the main steelhead run which accounts for the small amount of steelhead caught.

Table 16. (See following page)

Table 17. Age, Sex, and Size Composition of Karluk River Chinook Salmon, 1978.

Age Class	Males						Females						Total	%
	Length			Weight			Length			Weight				
n	%	\bar{x}	+SD	\bar{x}	+SD	n	%	\bar{x}	+SD	\bar{x}	+SD			
1.1	1	1.1	440	0.0	.9	0.0	0					1	0.4	
1.2	3	3.2	683	66.5	3.4	0.2	0					3	1.3	
1.3	24	25.9	848	50.8	7.7	2.0	32	23.2	830	25.9	7.9	1.5	56	24.2
1.4	62	66.7	941	51.7	10.6	1.7	105	76.1	916	49.4	10.3	1.6	167	72.3
1.5	3	3.2	883	55.1	8.3	1.6	1	0.7	1029	0.0			4	1.8
													231*	100.0

- * 60 fish sampled at Karluk Lagoon Weir
 84 fish sampled from anglers creels at Portage
 87 fish sampled from anglers creels at Karluk Lagoon
 n=231

Table 16. Length, Age and Sex Composition of Steelhead Retained by Karluk River Anglers, September - November 1978.

Age	Brood* Year	Males				Females				Total	
		n	%	\bar{x} Length (mm)	+S.D.	n	%	\bar{x} Length (mm)	+S.D.	n	%
2.1	1974	7	41.2	553	31.6	5	13.5	558	48.7	12	22.2
2.2	1973	5	29.4	666	84.2	22	59.5	679	38.3	27	50.0
2.2S	1972	1	5.9	760		1	2.7	750		2	3.7
2.1S1	1972	3	17.6	757	60.3	3	8.1	670	72.5	6	11.1
2.2S1	1971	1	5.9	800		6	16.2	771	28.6	7	13.0
Totals		17	100.0			37	100.0			54	100.0

* Brood Year = Year adults returned to stream

salmon, the first record of this disease in Alaska king salmon.

Gould's studies will continue in 1979.

A survey of archeological sites selected by Natives was conducted by Mike Yarborough (Alaska Area Office Archeologist) in the 1978 field season. This was a continuation of the 1977 studies. The 1978 field season report has not yet been submitted at this writing.

A special use permit for beach sediment sampling was issued to the U. S. Geological Survey, Menlo Park, California in 1978. Sediment samples were taken from beaches around Kodiak Island for determination of their oil retention capacities. Obviously USGS is considering the possibilities and potential problems involved with oil spills on Kodiak Island beaches. The final report from this work has not yet been received.

B. Cooperative Programs

Nothing significant to report.

C. Items of Interest

1978 was a year of personnel changes at Kodiak. Ed Wickersham's transfer to Law Enforcement was finalized and John Trapp transferred to the Migratory Bird Coordinator's office in the Alaska Area office.

Dorothy Dryden entered on duty as administrative clerk. Ed Hajdys was hired to fill the Assistant Refuge Manager (Trainee) slot; Mike Vivion transferred from Izembek NWR, in Cold Bay, Alaska, to the Assistant Manager position at Kodiak. Karen Hawley was hired as clerk-typist, and Dennis Zwiefelhofer was hired as biological technician. Harvey Heffernan transferred from San Luis NWR to Kodiak, as Assistant Refuge Manager.

All members of the refuge staff participated in preparation of this report.

D. Safety

One employee injured his back while moving floatplane tie-downs at Karluk Lake. A claim was filed with OWCP. The employee was still on light duty at this writing.

E. ANSCA

1978 was a year of tremendous development and disaster in the villages adjacent to the refuge. Old Harbor, Akhiok, Karluk, and Larsen Bay all received federally-financed housing. Public Health Service worked on plans to install sewer and water systems to the new homes. All of the villagers except Karluk now have

satellite relay telephones that work occasionally. A new school was built at Old Harbor, and plans are set for building new schools at all of the other villages.

Karluk experienced much damage in early January from a severe winter storm. Storm tides washed away part of the spit that acts as a barrier in front of the village. The foot bridge connecting the two halves of the village was carried away, and a 10,000 gallon tank containing 8,000 gallons of fuel oil was washed into the lagoon. About 3,000 gallons of the oil spilled but most of it was washed to sea by tidal action, and swiftly dissipated. Governor Hammond declared Karluk a disaster area.

In late spring three homes at Akhiok burned, killing two people. The three houses constituted about 20 per cent of the existing houses at the village. New housing constructed in Akhiok in the fall was timely after such a disaster.

Litigation on the contested villages at Uyak, Village Island, and Ayakulik continues. Originally BIA determined that the villages were not legitimate when they reviewed them. Koniag appealed to the courts who then determined them legitimate. Upon appeal by the FWS and local individuals opposing the certification the higher court agreed with BIA's original determination that the villages were not eligible for certification. However they did determine that DOI had not adhered to the due process procedures. The determination was again returned to the Secretary of Interior whose decision on how the matter will be settled is pending. The refuge could stand to lose up to 207,360 acres of land if the villages are certified.

A highly complicated and controversial period occurred during 1978 concerning the issuance of 23 special-use permits (SUP) by the FWS to commercial fishermen who operate salmon setnet sites, and one SUP to a commercial bear guide on refuge lands. This land had been selected by the Village Corporation of Akhiok and also these lands were published by BLM for interim conveyance. Many of the setnet sites had histories which preceded the date of the ANSCA. Several of the sites, however, which preceded the Act had passed to different users than the persons to whom we first issued a SUP. Some of the SUP's for sites were first issued after the date of the Act. Furthermore all the SUP's are issued for only the period of May 15 to September 15 of each year. At each of the 24 SUP's sites at least one cabin exists which belongs to the permittee and is permitted on Refuge lands for the purpose of supporting the fishing operation or guiding operation.

When BLM published the decision for interim conveyance of lands to the Natives of Akhiok, Inc., pursuant to Sections 14-A and 22-J of the ANSCA, of December 18, 1971, the Kodiak Island Setnetters Association appealed the decision under 43 CFR 4.9002 (property interest claim) to the Alaska Native Claims Appeal Board. The Appeal Board rendered a decision on the appeal that the appellants had not established such an interest in the land in question as to

satisfy the "claim a property interest" requirement of 43 CFR § 4.902, and that the appellants were without standing to bring the appeal. The FWS, operating under the provision for interim administration as published in 43CFR § 2650.1, solicited the opinion of the Natives of Akhiok, Inc. concerning our (FWS) issuance of temporary permits for the 1978 season through a meeting between the FWS and the Corporation in Kodiak. The Corporation verbally, and in writing, told us that they did not want the FWS to issue permits of any kind on lands to be conveyed to them. The FWS then notified all of the permittees that we would not issue permits to them.

The setnetters then appealed to the Alaska congressional delegation to have the FWS continue to issue permits, at least during the 1978 fishing season, until such time as the lands were conveyed and they could then resolve the issue with the Natives of Akhiok, Inc.

After several reviews by the Alaska solicitor, a trip to Kodiak by representatives of the Alaska and Washington office solicitor's office and Interior Department personnel, the FWS was requested to issue the permits with the stipulation that the SUP's were valid only through the current 1978 season or until the land was conveyed, whichever occurs first.

The land was conveyed in November 1978. The land is now private, property belonging to the Natives of Akhiok, Incorporated. The FWS will not issue permits in 1979.

The setnetters will be required to negotiate the future of these sites with the Village Corporation. However, because Refuge rules and regulations will still apply to those village lands selected from the Refuge it is uncertain at this point and undetermined at this point what effect this will have on involvement of the Refuge into the future use of the sites.



Native village of Akhiok. This is the most distant and the least "modern" village on the Refuge located some 95 air miles from the city of Kodiak, on the extreme southwestern end of Kodiak Island. All the structures in the right side of the prints represent the old village, and those structures on the left are all new housing units installed during 1978 through funding from BIA. The print was taken from the end of the gravel air strip located out of the print in the foreground. Residents of the village of Kaguyak also live at Akhiok since the tidal wave destroyed their village in 1964. The two certified villages are combining their resources and jointly forming a village corporation to deal with the matters of ANSCA.