

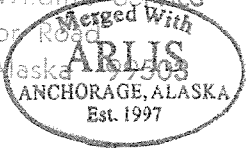
KODIAK NATIONAL WILDLIFE REFUGE
Kodiak, Alaska

ANNUAL NARRATIVE REPORT CY 1979

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



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ANNUAL NARRATIVE REPORT
Calendar Year 1979

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



PERSONNEL

- | | |
|--------------------------|---|
| 1. Robert L. Delaney | Refuge Manager PFT, GS-12 |
| 2. Michael T. Vivion | Assistant Refuge Manager PFT, GS-11 |
| 3. Harvey Heffernan, Jr. | Assistant Refuge Manager PFT, GS-9 |
| 4. Edward R. Hajdys | Refuge Manager Trainee PFT, GS-7 |
| 5. Michael B. Rearden | Native Liaison Specialist PTF, GS-9
(LWOP 9/25 to attend U. of A.) |
| 6. Dennis Zwiefelhofer | Biological Technician PCS, GS-5 |
| 7. Tom Emerson | Vessel Master PCS, WG-10
(EOD - 04/09/79) |
| 8. Dorothy Dryden | Administrative Clerk (typist) PPT, GS-5 |
| 9. Karen Hawley | Clerk Typist PCS, GS-3
(LWOP 9/21 - Trans. 12/16 to Office
of Biological Services in Ft. Collins, Co) |
| 10. Donna J. Coleman | Clerk Typist PCS, GS-3
(EOD 12/02/80) |
| 11. Doug Molyneaux | Biological Aid (Wildlife) TPT, GS-3
(EOD 05/21 - Term. 09/14/79) |
| 12. Lupe Lopez | Biological Aid (Wildlife) TPT, GS-4
(EOD 06/03 - Term. 07/10/79) |

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REVIEW AND APPROVALS

Robert L. Pelroy 02/25/80
Submitted by Date

Don E. Redfearn 4/23/80
Area Office Date

Kodlak NWR 02/25/80
Refuge Date

Jan C. Riffe
Asst. Area Director
4/23/80

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 ranges of the brown bear and other wildlife. The Refuge boundary was realigned by Public Land Order # 1634, in 1958, along the mountainous divide on the Island with the intent of restricting incompatible practices and uses to the area east of the new boundary.

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 2000 and 4000 feet and at least 40 cirque glaciers, all less than two 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. Approximately 400 miles of clear swift-flowing streams with gravel bottoms drain mountain snowfields. Nine major rivers, totalling 250 miles, flow southwest into Shelikof Strait. Karluk Lake is the largest and most scenic of 271 fresh-water lakes and is 12 miles long by about 2 miles wide. About 1500 small ponds are scattered over the glacial-sculptured topography, many occurring in chains along the main glaciated valleys. Roughly, 111,000 acres of open water and 59,000 acres of bog-marshlands occur on the Refuge.

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 (off the Refuge), 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 permanent frost free landscapes.

B. Climatic and Habitat Conditions

Table 1 includes weather data for the Kodiak area as compiled by the National Oceanic and Atmospheric Administration (NOAA) in 1979. The weather data was collected at the NOAA station located at the Coast Guard Support Center, ten miles southwest of municipal Kodiak, Alaska.

Table 1. Kodiak Weather Data

	Snowfall (Inches)	<u>Precipitation</u>			<u>Temperature</u>					<u>Wind</u>	
		1979	Normal	Deviation from Normal	Max	Min	Avg	Dev	Avg mph	Max	Gust (Knots)
Jan.	4.2	8.66	5.01	+3.65	47	19	38.0	+7.6	11.7	43	
Feb.	10.6	1.50	4.89	-3.39	48	12	27.1	-4.3	13.7	45	
Mar.	18.0	6.23	3.85	+2.38	51	18	37.8	+5.7	11.1	46	
April	0.1	3.39	3.81	-0.42	57	28	44.2	+2.6	9.2	39	
May	T	9.29	4.35	+4.94	74	33	45.9	+2.7	11.3	34	
June	0.0	4.83	4.12	+0.71	67	40	53.4	+3.7	9.9	38	
July	0.0	3.02	3.54	-0.52	79	45	58.6	+4.5	7.6	38	
Aug.	0.0	3.71	4.30	-0.59	75	45	57.1	+2.2	7.8	26	
Sept.	0.0	10.34	6.11	+4.23	70	33	52.9	+2.9	11.0	43	
Oct.	T	10.84	6.28	+4.56	60	28	45.6	+4.9	10.4	39	
Nov.	9.7	5.19	5.41	-0.22	52	14	38.5	+3.7	9.7	54	
Dec.	4.7	1.37	5.03	-3.66	46	2	26.8	-3.1	12.5	46	
TOTAL	47.3	68.37	56.70		AVERAGE:		43.82		10.5		

Total precipitation was 11.67 inches above the normal of 56.70 inches with 68.37 inches recorded. September and October had particularly high rainfall with over 10 inches recorded each of these months. These heavy rains were beneficial to Fall spawning salmon after the low rainfalls of July and August which left many valuable spawning beds unavailable to salmon. This problem was further magnified by the lack of high level snow accumulation during the winter and spring. The runoff from snowfields usually peaks during the late June through August period. It should be noted that rainfall patterns throughout the Refuge varies by as much as 70 inches. The eastern portion of the Refuge in the vicinity of Kiluda Bay receives as much as 95 inches each year, while the western, generally treeless, tundra portions averages only 25 inches or less per year.

Stream water flows were so high and rapid into Karluk Lake during October that Fishery Rehabilitation and Enhancement Division (F.R.E.D.) personnel of Alaska Department of Fish & Game (ADF&G) were unable to successfully gravel plant red salmon eggs in Upper Thumb River as part of a salmon rehabilitation program they are conducting.

The late summer early fall low lake and stream levels did, however, provide brown bear with easy fishing as wide dry lake shores and stream beds made access to spawning salmon an easy task. Bears were numerous along shorelines and streams during this period.

Snowfall was, as last year, approximately one-half the normal 90 inches, with 47.3 inches recorded. The low snowfall, coupled with above average summer temperatures, produced snow-free mountains throughout the Refuge except the main mountainous divide. It has been several years since this has occurred. The first snowfall of the fall occurred September 28 and dusted mountain tops down to the 3,200 foot level. The highest snowfalls occurred during February and March, which is the normal occurrence.

Temperatures averaged 2.76 degrees above normal, with the average monthly temperature recorded at 43.82 degrees. A high temperature of 79 degrees occurred in July, with a low temperature of 2 degrees recorded in December. Mild winter temperatures during early winter delayed the freezing of large inland lakes until February. Karluk Lake froze over during the week of 21 February and two weeks later was ice-free again. Below normal temperatures in December, particularly the last several days, produced conditions which froze Karluk Lake on December 31. The first frost of the season occurred on September 28.

Abnormally high winter and spring temperatures and low snowfall produced ideal wintering conditions for the rapidly expanding Sitka black-tailed deer population.

C. Land Acquisition

1. Fee Title

During February the Refuge Manager, Harding Smith, and Frank Defendorf (Realty Office - AO) met with Wayne Hans, Clara Helgason, and Leonard Helgason at Refuge headquarters, in an attempt to undertake an administrative land trade which would increase the Refuge by a 318-acre parcel of land in Uyak Bay.

Wayne Hans currently uses approximately 15 acres of Refuge lands, under special use permit, for a cannery and set-net fishing site. They have used this land since 1959. Mrs. Helgason, and her son, Leonard, currently occupy approximately 20 acres of Refuge lands. Although the Helgason's full-time occupancy of this property extends over a period exceeding 30 years, with mining claims preceding that time, they have never received patent to the area and were issued a special use permit

for the first time in 1979.

Both of these parties wish to own the parcels which they use. Refuge administration could also be simplified through elimination of these two improved privately used parcels. (See Map No. 1).

Mr. Hans and the Helgasons were to attempt to acquire a 318-acre inholding (Murphy Homestead) located at the south end of Uyak Bay which was currently for sale. The acreage has high wildlife values and the FWS had attempted its purchase in the past, with little success, even when offer for \$ 12,000. A current Biological Ascertainment Evaluation exists for the tract. When the purchase of the tract by Hans and Helgasons is completed an equal value land exchange would be undertaken.

The entire exchange met an early obstacle, however, when Hans didn't coordinate with Helgasons on the purchase and the owners of the 318-acre tract decided now was the time to make a healthy profit.

Additional complications occurred when the Alaska Lands Legislation (D-2) did not pass and one of the exchange tracts is located on lands selected by an uncertified native village. Renegotiations will be attempted after the Alaska Lands Legislation has been passed.

A land acquisition package was prepared by the Area Office in late December and submitted to the Washington, D.C. office for the purchase of 2,500 acres, in 72 separate small inholding parcels located on the Refuge. The purchase, if approved, would be through the Land and Water Conservation Funds (LWCF).

Five members of the Refuge staff and the Area Management Biologist of ADF&G completed biological evaluation assessments on all native conveyed lands within the Refuge to determine their biological value should any trade, exchange, lease, or purchase arrangement become a reality.

2. Easements

Not applicable.

3. Other

ANSCA

Two certified villages on the Refuge were conveyed portions of their selected land in 1979. Only one of these conveyances, however, were from Refuge acreage. Each of the five villages is entitled to select land not to exceed 69,120 acres from the Refuge. Map No. 2 shows the location of selected lands.

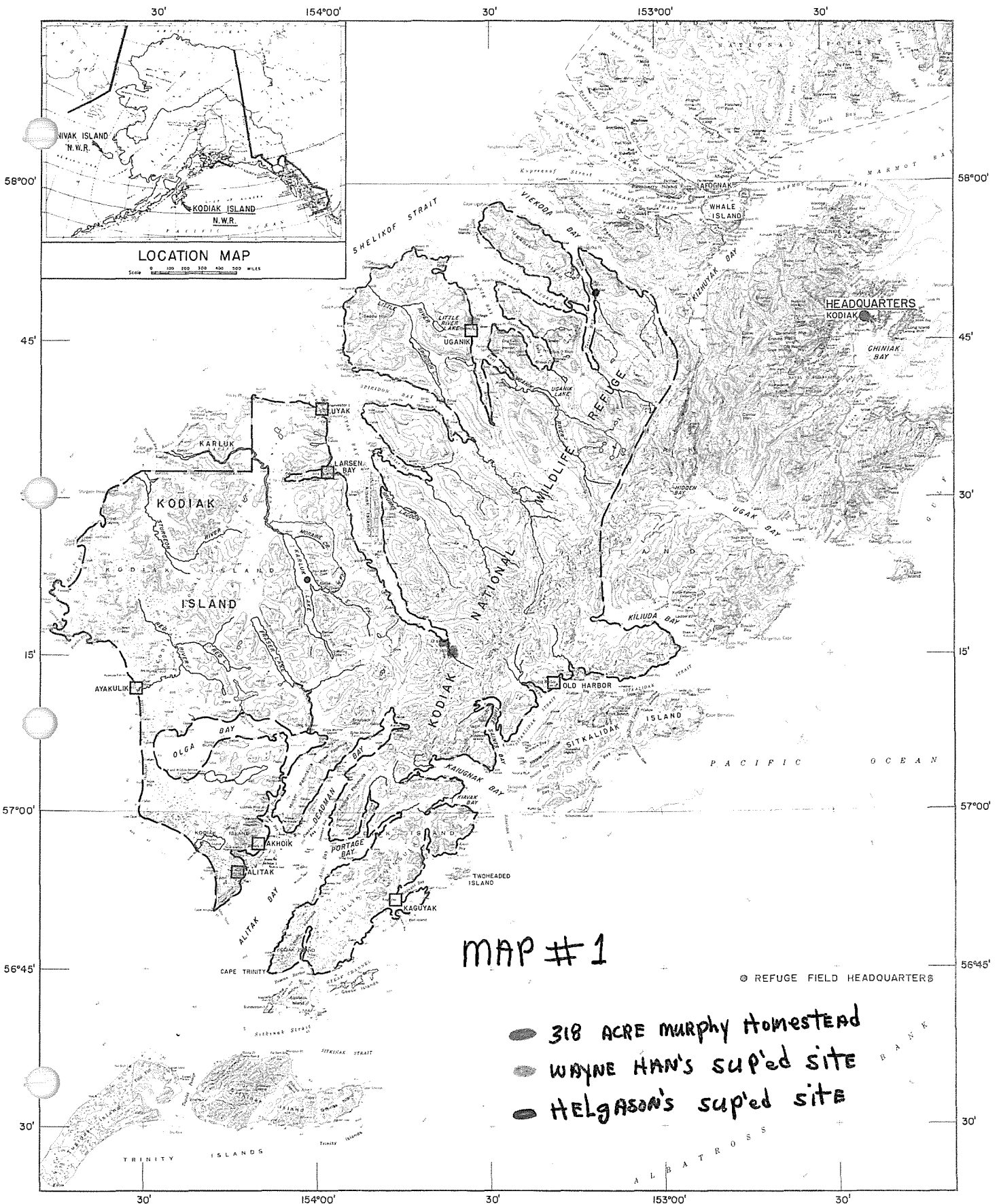
KODIAK ISLAND NATIONAL WILDLIFE REFUGE

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UNITED STATES
DEPARTMENT OF THE INTERIOR

ELECTION DISTRICT NO. 13 — KODIAK, ALASKA

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



MAP #1

REFUGE FIELD HEADQUARTERS

- 318 ACRE MURPHY HOMESTEAD
- WAYNE HAN'S SUP'ED SITE
- HELGASON'S SUP'ED SITE

COMPILED IN THE BRANCH OF ENGINEERING
FROM SURVEYS BY U.S.G.S., AND NATIONAL
PARK SERVICE

PORTLAND, OREGON

AUGUST 1964

SEWARD MERIDIAN

Scale 400 0 400 800 1200 1600 2000 CHAINS
5 0 5 10 15 20 25 MILES
CONTOUR INTERVAL 200 FEET DATUM IS MEAN SEA LEVEL

6	5	4	3	2	1
7	6	5	4	3	2
8	7	6	5	4	3
9	8	7	6	5	4
10	9	8	7	6	5
11	10	9	8	7	6
12	11	10	9	8	7
13	12	11	10	9	8
14	13	12	11	10	9
15	14	13	12	11	10
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22	21	20	19	18	17
23	22	21	20	19	18
24	23	22	21	20	19
25	24	23	22	21	20
26	25	24	23	22	21
27	26	25	24	23	22
28	27	26	25	24	23
29	28	27	26	25	24
30	29	28	27	26	25

TOWNSHIP
DIAGRAM



MEAN
DECLINATION
1962

6R ALA 356 404

Nu-Nachk-Pit, Inc (Larsen Bay)
Mr. Charles Christensen, Pres.
Larsen Bay, AK 99624

KODIAK ISLAND NATIONAL

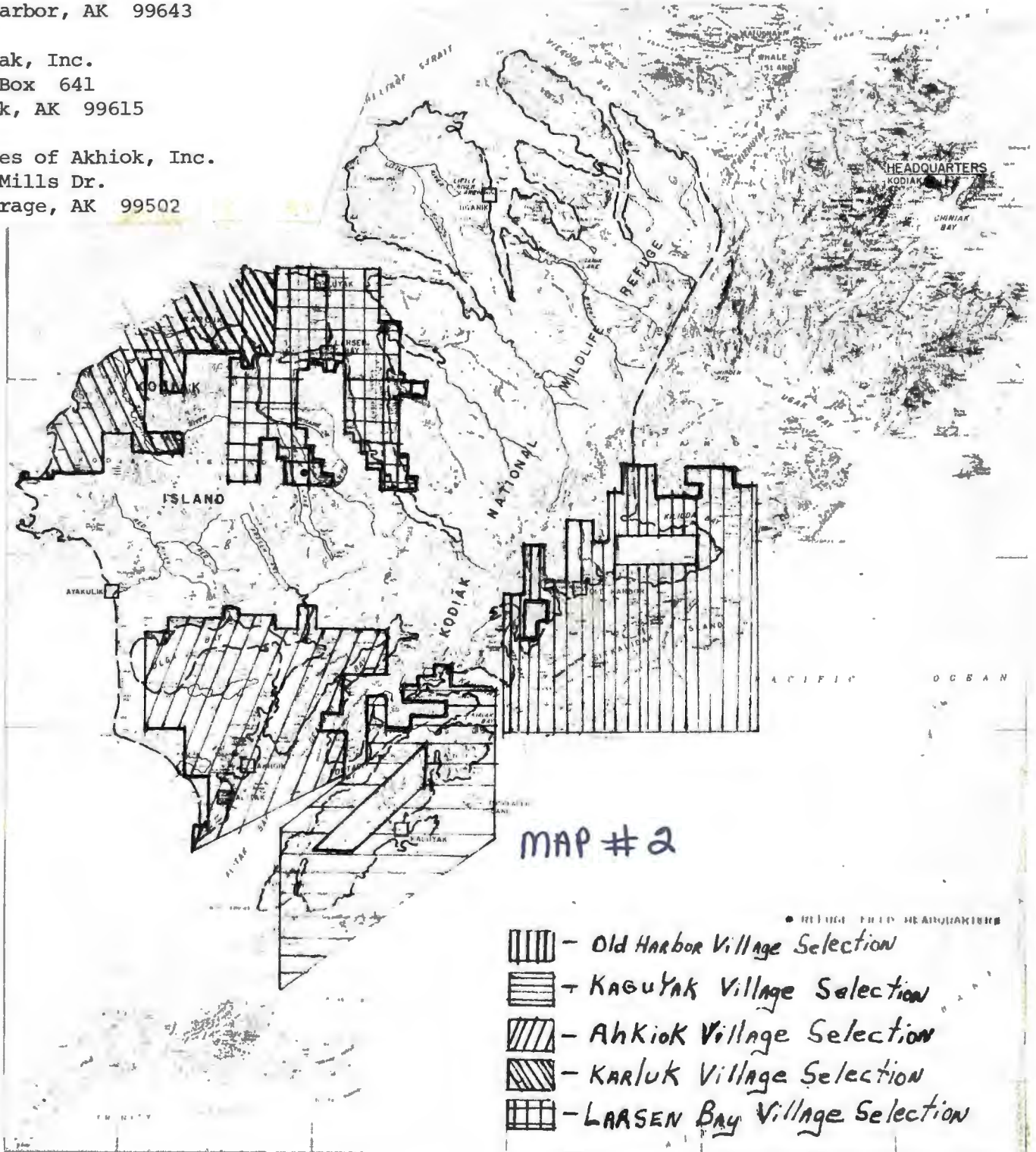
Karluk Native Corporation
P.O. Box 2682
Kodiak, AK 99615

WILDLIFE REFUGE

Old Harbor Native Corporation
P.O. Box 35
Old Harbor, AK 99643

Kaguyak, Inc.
P.O. Box 641
Kodiak, AK 99615

Natives of Akhiok, Inc.
5028 Mills Dr.
Anchorage, AK 99502



The following acreages have been conveyed as of year end 1979:

	<u>1978 Conveyance</u>	<u>1979 Conveyance</u>
Old Harbor	33,960	
Akhiok	55,341	441
Kayuyak	5,944	
Larsen Bay	63,305	
Karluk	49,034	
	<hr/>	<hr/>
	208,584 acres	441 acres
Grand Total:	209,584 acres	

Headquarters Site

After a long and eventful struggle a long term lease agreement was completed with the U.S. Coast Guard for 35 acres of land on which to construct a new Refuge headquarters complex and 2 acres on which to construct an airplane hangar and water ramp. The property is situated on the Kodiak Coast Guard Support Center located 10 miles southwest of municipal Kodiak. Consult the 1978 Narrative Report for a complete history of headquarter site acquisition.

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 outputs 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 failed to materialize.

2. Funding

Table No. 2 presents the funding and manpower status of the Refuge over the past six 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 results of the Bicentennial Land Heritage program.

Table 2. Funds and Manpower Patterns - FY 1975 through 1980

FISCAL YEAR	1975	1976	1976TQ	1977	1978	1979	1980
PFT Manpower	4	4	4	4	5	5	5*
PPT Manpower	1	3	3	1	1	1	1
Career Seasonal				0	2	3	3
Temporary	2	2	2	0	2	2	2
MNMB	97,000	95,000	22,000	131,000	181,400	180,000	160,000
MB	21,000	26,000	2,000	31,000	42,000	87,000	68,000
I&R	13,000	16,000	7,000	12,000	40,000	40,000	40,500
Total Operation	131,000	137,000	31,000	174,000	263,400	257,000	254,000
Rehabilitation				83,000		28,000	14,000
Construction						786,000	500,000
Grand Total	131,000	137,000	31,000	257,000	263,400	1,071,000	768,500

* Native Liaison Specialist went on extended LWOP during late August 1979 to attend University of Alaska for completion of necessary biological courses to qualify for Biological and/or Manager Series staff positions.

The increase of one PFT position listed in 1978, 1979, and 1980 was an additional BLHP position ceiling for a Refuge Manager Trainee. All other personnel increases have been through the use of part-time/temporary and career-seasonal appointments.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

Seven hundred eighty-six thousand dollars of BLHP construction funds were made available for construction of a new Refuge headquarters-shop complex near municipal Kodiak, Alaska on land acquired under long-term lease from the U.S. Coast Guard.

The engineering designs were completed under contract in late summer. Bids for construction were solicited and received prior to the end of the fiscal year in late September. All bids received were well above the \$786,000 dollars available and no bids were accepted. A request was made to the Central Office for additional funds but no additional funds were forthcoming by year's end. The fate of the complex remains undetermined, but options include a) acquire additional funds; b) delete a portion of the project (shop buildings); c) combine anticipated fiscal year 1980 funds for housing to accomplish the Headquarters complex during FY 1980.

Additional force account construction work was completed on the FWS 48' wooden sea-going motor vessel (M/V) the Ursa Major. By

year's end the M/V vessel was essentially put into original condition with much modernization of equipment. The following repairs, alterations, or new equipment were completed:

- 1) New 125 hp caterpillar afterblown diesel engine was installed.
- 2) New hydraulic anchor winch installed.
- 3) New hydraulic operated capstan was installed.
- 4) New 6' custom built aluminum skiff was constructed for use off the M/V.
- 5) Five survival suits and signalling equipment was purchased.
- 6) New 120/12 volt refrigerator installed.
- 7) Stabilizer outrigger system was installed.
- 8) New Loran C was purchased and installed.
- 9) New digital fathometer was installed.
- 10) HF radio and antenna were installed.
- 11) Two additional 200-gallon aluminum fuel tanks were fabricated but not installed by year's end.
- 12) New 2" portable water pump and hose was purchased.
- 13) Entire vessel was rewired.

A new 15' Boston Whaler skiff was purchased and ferried to the Camp Island Field Headquarters via U.S. Coast Guard helicopter to replace a handmade wooden skiff.

A one-thousand gallon fuel storage tank was buried and fitted with electric-metered pump for aircraft fuel at the FWS Lilly Lake airplane ramp. In addition a new 6'x12' storage and weather shed was constructed over the new buried tank. A new wooden floatplane ramp was constructed with sealed floats and installed for the Cessna 185 moored at Lilly Lake.

Four new prefabricated 10'x12' recreational cabins were constructed. The design included an extended 4' roof and 4' entrance floor overhang at the front of the cabin. Three of the four cabins were erected and placed into service during the year. The fourth cabin was flown to the location site via Coast Guard helicopter at north Frazer Lake and will be erected during early spring of 1980. See Map # 3 for location of the new cabins and existing cabins.

B. Maintenance

Recreational Cabins

Uganik Island cabin: Interior painted, including floor and all accumulated trash removed. Karluk Lake outlet Cabin: Inside cleaned and washed out after bear break-in. Old burning barrel and all accumulated trash removed.

Administrative Buildings

Camp Island Facilities: New asphalt rolled roof installed on north side of main cabin and on shop building. New window installed in rear of main cabin. New galvanized metal roof installed on

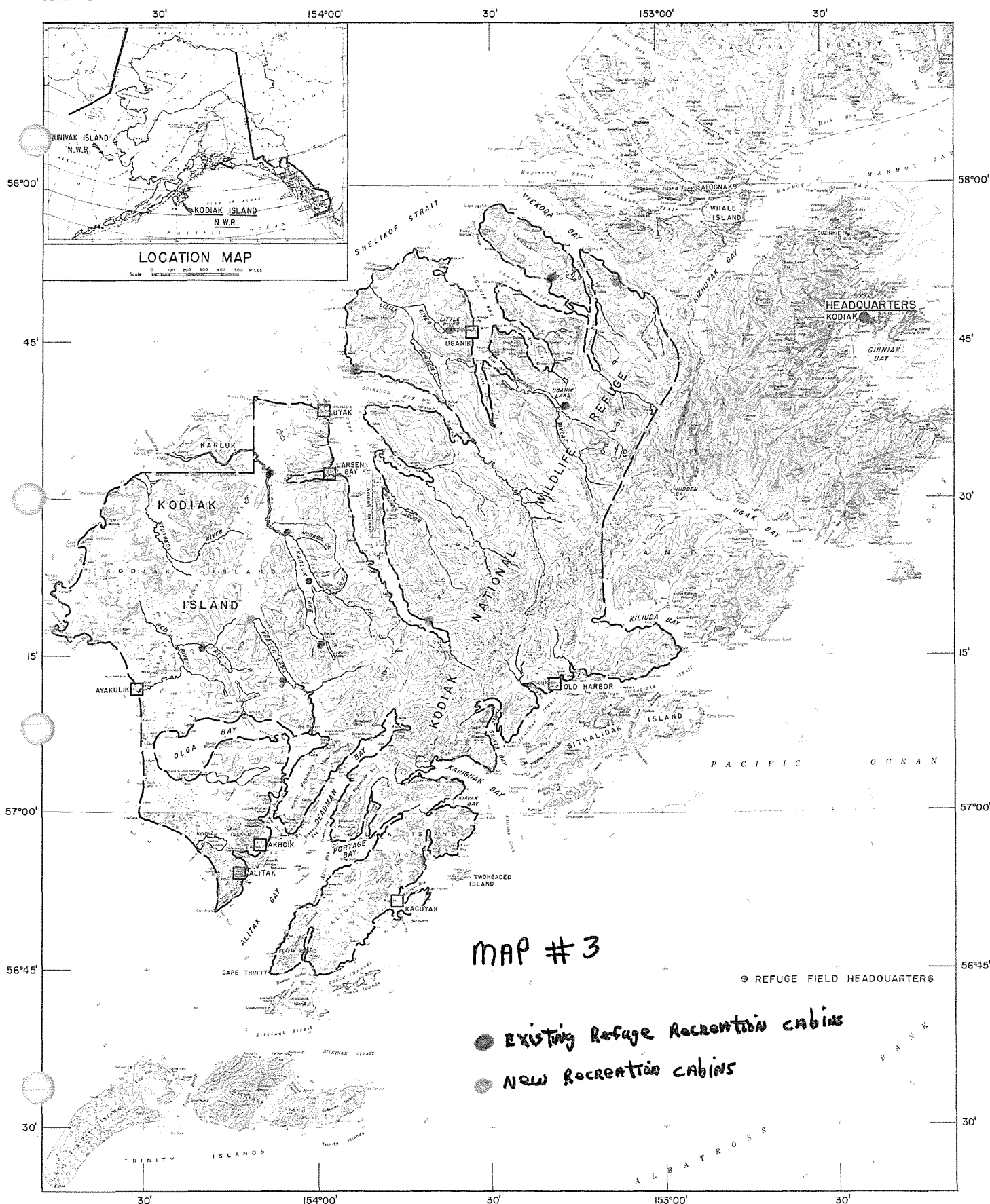
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ELECTION DISTRICT NO. 13 — KODIAK, ALASKA

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30	29	28	27	26	25
31	32	33	34	35	36



Four new pre-fabricated cabins were acquired this year to provide for the increased recreational use on the Island. U.S. Coast Guard helicopter's were used to ferry the cabin parcels to interior sites and the FWS/MV Ursa Major for transport to ocean bay locations. This cabin is located in Chief Cove on the Spiridon peninsula. All four of the cabins were identical in design. R.D.



Aerial view of new recreational cabin located at Rolling Point on Viekoda Bay. R.D.

Thirty, 55 gallon drums of AV-gas were transported from Kodiak via the M/V Ursa Major to Larsen Bay and then ferried via a chartered Kodiak Western goose to the field headquarter site at Camp Island on Karluk Lake. By using the FWS M/V to ferry the fuel to Larsen Bay 3/4 of the transportation cost were saved. M.V.



A new metal roof was installed on the lab-dormitory bldg. located (on left) at Camp Island as well as numerous other repairs made to the building. H.H.

laboratory-dormitory building. A two-ton chain hoist was installed in the shop building in Kodiak.

QUARTERS No. 1

- 1) Exterior of house was stained brown and all trim painted white.
- 2) Rotten rear porch was removed and new concrete porch constructed.
- 3) Old dog kennel at north side of house was removed.
- 4) 10 yards of gravel placed on driveway.
- 5) New galvanized metal roof was installed and old non-functional brick chimney removed.
- 6) Contract was let for new hot water baseboard heat system to replace malfunctioning forced air system, but installation was not complete by year's end.

QUARTERS No. 2

- 1) Entire exterior of the building was stained, and all trim painted white.
- 2) Rain gutters were installed on all roof eaves.
- 3) Curtains were purchased and installed throughout the house.
- 4) New overhead combination ceiling light and fan was installed.
- 5) Several new thermostats and heat zone valves were installed (at no cost by contractor) and, eventually, the heat circulating pump was found to be in backwards and was corrected.

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 wild-life habitat.

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

F. Wilderness and Special Areas

An application for license to construct a hydroelectric project on Terror Lake, within the proposed Kodiak wilderness area, was received from the Kodiak Electric Association (KEA) by the Federal Energy Regulatory Commission (FERC). The U.S. Fish and Wildlife Service prepared a compatibility assessment report on the project dated May 31, 1979, and could not make an affirmative finding that the project was compatible with the purposes for which the Refuge was established. In the absence of such a finding the Alaska Area Director notified KEA of his finding - that the project would be incompatible with the purposes for which the Refuge was established. Kodiak Electric Association appealed the incompatibility ruling to



Quarters # 1 prior to extensive rehabilitation work. M.R.



Quarters # 1 after new siding was installed and stained. New chain link fence was installed and grounds cleaned up. A new roof and oil-fired baseboard heaters were installed after photo taken. R.D.

the Director of the Fish and Wildlife Service. No final ruling by the Director has been made but KEA was granted special use permits to conduct further environmental and engineering feasibility studies for the purpose of gathering additional information prior to a final decision by KEA concerning feasibility of the project and prior to FWS final determination on compatibility of the project. Reference Map No. 4 for the location of the project.

- G. Easements for Waterfowl Management - nothing significant to report.

IV. WILDLIFE

A. Endangered Species

Peregrine falcons are annually observed on Kodiak Island. The majority of the sightings are believed to be Peale's subspecies, the only peregrine race not on the endangered list. The tundra peregrine (an endangered species) is believed to occasionally migrate through the Kodiak area, but this has not been verified.

Peale's peregrine falcons are known to nest in isolated portions of Kodiak Island, but the nesting population is extremely small and widely scattered through the more rugged areas of the Refuge.

On October 10 two area duck hunters reported observing a peregrine falcon knock a hen mallard out of the air causing it to fall approximately 200 feet into Kizhuyak Bay. The duck appeared to be no worse for the wear as it had recovered enough to take wing when the hunters attempted to approach in their skiff.

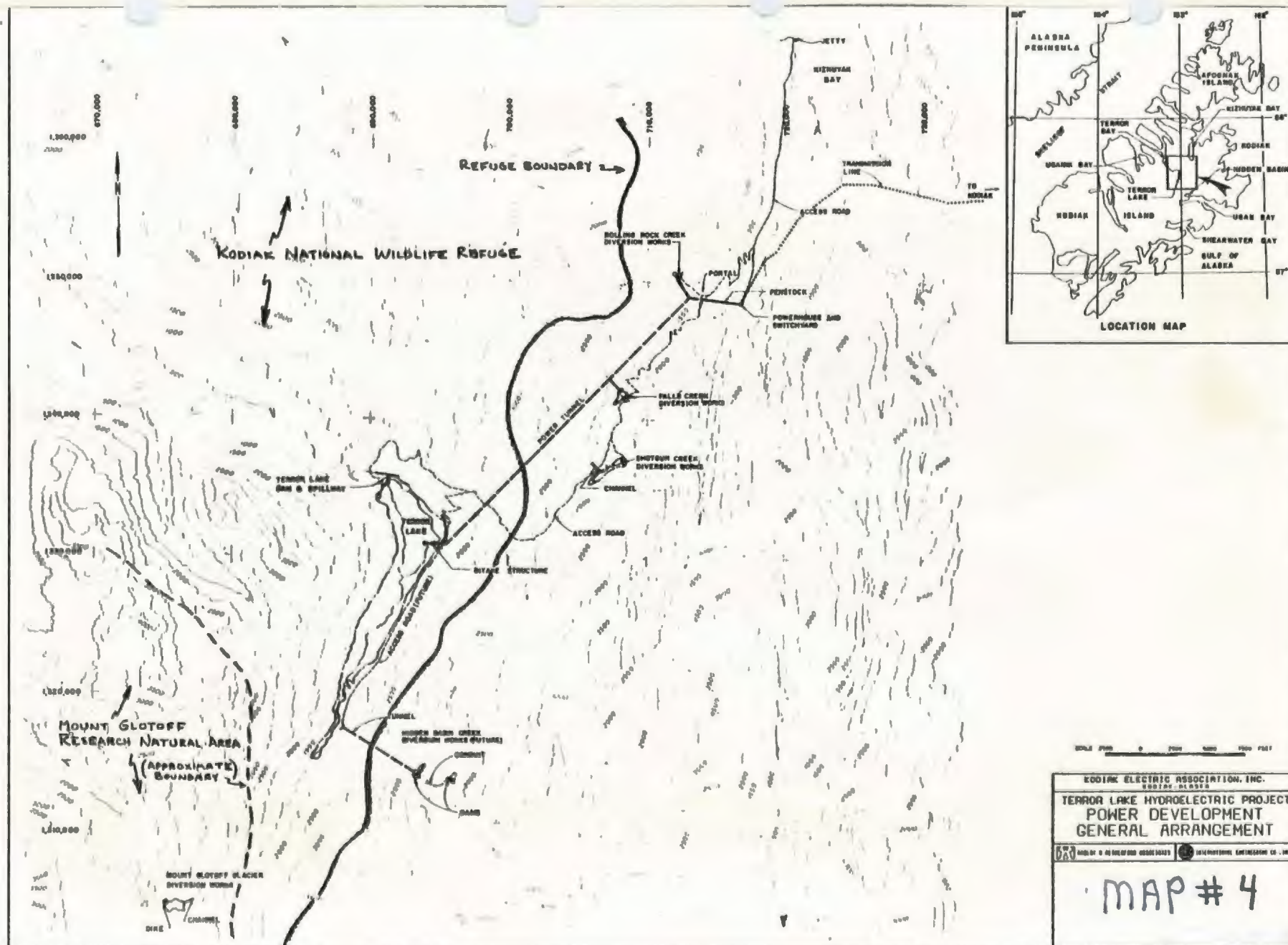
On November 17 an immature Peale's peregrine was observed as it attempted to catch one of the several thousand crested auklets in the Afognak Straits area. After making five unsuccessful passes at different flocks of auklets the young falcon finally captured a crested auklet from a group of approximately 30 birds.

Larry Matfay, a bear guide and fisherman from Old Harbor, provided historical information on Canada goose nesting on the Geese Islands off the south coast of Kodiak Island. According to Larry Canada Geese at one time nested on the Geese Islands but stopped nesting there when fox were introduced for fur farming. Larry remembers seeing pairs of Canada geese there in spring when he was a boy, but hasn't seen them there for 30-40 years. Larry was born and raised in Akhiok, and though he is now over 60 he has an excellent memory and is an excellent source of historical information. It is possible that the Canada geese Larry saw were the Aleutian subspecies.

B. Migratory Birds

Introduction

Implementation of the migratory bird management plan was initiated



in November, with the first pelagic seabird survey conducted from the 48-foot M/V Ursa Major.

The surveys began on November 8 and were completed in two segments, with a break during the Thanksgiving holiday. The first segment (Nov. 8-21) covered the west side of Kodiak Island, and the second segment (Nov. 26-Dec. 4) covered the eastern portions of Kodiak.

Doug Forsell, OBS-CE biologist, accompanied Refuge personnel on the initial surveys to instruct them on proper methods and procedures to follow. A total of 808 miles was covered during 107 hours of running time. Transects were completed during 61.3 hours of the total running time.

Western Sitkalidak Straits had both the highest density for an inner bay area (119.3 birds/km²) and also the highest estimated number of birds (30,057) for any of the areas on the Refuge. (Table No. 3). Uyak Bay had the lowest density (58 birds/km²) of any of the inner bay areas sampled on the Refuge. However Uyak's outer portions had the highest density (72.9 birds/km²) of any of the outer bays sampled and eastern Sitkalidak Straits had the lowest density of the outer bays (35.9 birds/km²).

Continental shelf areas on both sides of Kodiak Island had the lowest densities of any of the areas sampled. The Shelikof Strait area had a density of 25 birds/km² while the Pacific (eastern side) shelf had a density of 22.4 birds/km².

Murres were the most abundant species observed, comprising 26.6% of the total birds in all transects. (See Table No. 4)

Table No. 4 Species Abundance in the Survey Transects

Species	Percent of Total	Approx. No. of Individuals
Murres	26.6%	6594
Crested Auklets	19.2%	4759
Scoters	12.3%	3049
Old Squaw Duck	11.5%	2851
Black-legged Kittiwakes	8.1%	2008
Cormorants (combined red-faced & pelagic)	6.2%	1537
Various gulls	3.6%	892

Crested auklets were the second most abundant, with 19.2% of the total birds. However this is an inflated figure because of the large concentrations (3500+) of this species in the Whale Passage and Afognak Straits area. Whale Pass is not included in the comparison Table 3 because it is not considered part of the Refuge. Third and fourth in abundance were the scoters, with 12.3% and old squaw at 11.5% of the total observed. Mallards were the most prevalent

Table No. 3 Pelagic Seabird Survey Comparison Table of Sample Areas

Survey Area	Total Area(km ²) of the Survey Area	Area Sampled(km ²)	Percent of Total Area	No. of Transects	Birds /km ²	Estimated Total No. of Birds	Survey Area Total
Uyak							
Inner	159.5	34.7	28.4%	42	58.0	9251	
Outer	145.8	23.3	16.0%	28	72.9	10626	
1)mudflats	--	--	--	--	--	3814	23,691
Uganik							
Inner	166.8	12.3	22.9%	46	94.7	15796	
Outer	74.3	38.2	16.5%	14	51.7	3841	
1)mudflats	--	--	--	--	--	2663	22,300
Western ₂ Sitkalidak Straits							
Inner	137.2	23.9	17.4%	29	119.3	16368	
Outer	190.3	15.4	8.1%	19	53.5	10189	
1)mudflats	--	--	--	--	--	3500+	30,057
Eastern ₃ Sitkalidak Straits							
Inner	160.0	28.3	17.7%	34	82.5	13206	
Outer	126.4	17.2	13.6%	21	35.9	4538	
1)mudflats	--	--	--	--	--	1500	19,244

1) Surveyed by skiff, members are instantaneous counts.

2) Includes Three Saints, Kiavak, Kaiugnak, Rolling, and Natalia Bays.

3) Includes all of Kiliuda, Amee, and Port Hobron Bays, plus McDonald Lagoon.

bird on the mud flat areas, comprising 80-85% (est) of all birds seen on the areas surveyed. A total of 24,788 individual birds were tallied in the 368 transects completed. This figure does not include the mud flat areas since the sampling method was different (done from a skiff) and some of the mud flat areas were inaccessible because of ice.

1) Waterfowl

Whistling swans have historically nested on Kodiak National Wildlife Refuge. The first nest record was noted on the upper Karluk River in 1955. However no mapping of nest locations or migratory staging areas has been made so data is limited to occasional opportunistic observations. Initiation of an annual whistling swan nesting survey will be made during the 1980 field season. The survey will be used to monitor nesting population size and productivity and define critical habitat areas.

A flight of 20 Canada geese was observed on November 24 at the head of Kizhuyak Bay by Assistant Refuge Manager Heffernan. Heffernan also spotted a pair of emperor geese in Alitak Bay earlier in November. Another pair of emperors was seen in Larsen Bay during the seabird survey on November 11. No substantial number of geese was seen on Kodiak Island during the 1979 nesting or migration periods.

The heaviest concentration of waterfowl found during the fall seabird survey was located in the Uyak Bay tidal flats. During a November skiff survey of the extensive mud flats at the head of Uyak Bay the following numbers of ducks were counted:

Mallards, 2300; pintails, 400; American widgeon, 200;
greenwing teal, bufflehead, and goldeneye numbering approximately 100 per species.

A public meeting was conducted during May on the subsistence use of waterfowl in the Kodiak area. Migratory bird biologist Robert Leedy (AO) and Refuge Manager Trainee Ed Hajdys represented the Fish and Wildlife Service. The meeting was poorly attended but the concensus of villagers present was that subsistence use of waterfowl on Kodiak Island is limited to sporadic hunts of minimal success. It was concluded from the meeting that waterfowl do not play a large part in the subsistence lifestyle of the average village resident on Kodiak Island.

2) Marsh and Waterbirds

Kodiak Island is not prime habitat for marsh birds and related species. However several areas, particularly the southern portion of the Refuge, are utilized, especially during migratory periods. Two pair of common loons were known to have successfully raised broods at Karluk Lake this year.

3) Shorebirds, Gulls, Terns, and Allied Species

Several northern phalaropes were observed in Uganik Bay near the Village Islands during the November seabird surveys. Their normal migration occurs in August and September. Small flocks (20 to 30) were also seen in McDonald Lagoon, on Sitkalidak Island while making small boat surveys of the shallow back bays.

Concentrations of crested auklets were seen in Afognak Straits on November 17. Several flocks of over a thousand birds each were seen during the surveys, the total number of auklets counted was about 3500.

A flock of five dark phase parasitic jaegers were observed between Karluk Lake and portage on the Karluk River June 27. The jaegers were engaged in what appeared to be a game of tag, with considerable display of aerial acrobatics and calling by all participants.

The Federal Aviation Administration (FAA) awarded a government study contract to Dr. Thomas Choate, professor of biology (U of A) for the purposes of determining possible solutions to the aircraft hazards created by large concentrations of gulls feeding in the estuarine area near the end of the main runway of the Kodiak State airport. The potential hazard has existed since the airport was opened. However increased air traffic in recent years has increased the possibility of aircraft bird strikes.

Gulls are not the only species feeding in the area, as the Buskin River tidal flats also attract bald eagles, numerous ducks and shorebirds. A breeding colony of glaucous-winged gulls and black-legged kittiwakes nests a short distance (1-2 miles) from the end of the runway and feeding area.

The study was initiated in June with marking and banding of juvenile gulls and kittiwakes by Elaine Rhode and Callie Leader (employees of Dr. Choate). Establishing daily and seasonal movement patterns around the airport is the first step in attempting to determine a solution to the problems created by the birds' presence. On September 12 Assistant Manager Vivion recovered one of the banded juvenile glaucous-wing gulls. It had died in Middle Bay and was washed up on the beach. Information was sent to the Bird Banding Laboratory.

4) Raptors

A marsh hawk was observed soaring off Cape Chiniak on November 26. Winter sightings of marsh hawks are a rare occurrence on Kodiak Island.

Total of ten rough-legged hawks were observed in both the alpine and over the Terror Lake valley in early September.

In December Alaska State Troopers requested aid in identification of a set of raptor feet confiscated from a deer hunter. The feet were identified as those of a western goshawk. Legal action is pending against the hunter for possession of parts of a protected species.

A total of sixteen dead bald eagles was brought into the Refuge office during the past year. (See Table 5). All the eagles were from off-Refuge areas adjacent to the Kodiak road system.

Table No. 5 CAUSE OF DEATH

	<u>Gunshot</u>	<u>Electrocution</u>	<u>Unknown</u>	<u>Total</u>
No. of Eagles	8	2	6	16

An immature bald eagle that was found locked inside an abandoned car near the American River was brought into the Refuge office on December 3. The bird was severely emaciated and succumbed to pneumonia-like symptoms after several days of intensive care.

Not all the eagle recoveries end tragically. In April an immature bald eagle was discovered hanging upside down by his foot in a Sitka alder tree near Buskin Lake. The bird was alive but disoriented so that it could not stand or fly. After several days of care the young eagle was totally recovered and was released back into the wild.

An immature golden eagle was observed during December soaring with several bald eagles in the Viekada Bay area. The sighting was made by Refuge Manager Trainee Hajdys during a late season deer hunt. A few golden eagle nests have been recorded on Kodiak Island in the past several years. One immature was seen soaring east of Terror Lake during early September.

Eagle nest surveys were not conducted this year due to the implementation of a new raptor management plan. Eagle nest surveys will be conducted every 5 years unless a significant decline in nesting population is observed. Should this occur nesting surveys will be conducted every other year. A merlin was observed twice in early September soaring near willow thickets adjacent to Terror Lake.

5) Other Migratory Birds

Early winter temperatures (Nov. & Dec.) have been much colder than the three previous unseasonably warm winters. A reduced passerine bird population was encountered during the annual Christmas bird count. Numbers of varied thrushes, black-capped chickadees, and red-breasted nuthatches around area bird feeders have been noticeably less. The colder temperatures apparently have persuaded more resident passerines to seek warmer climes to spend the winter.



Ayakulik River flats on the south-west end of Kodiak Island provides a striking contrast to habitat types over most of the Island. Sedge and grass border flat meandering streams with only scattered brush. Numerous ponds and lakes dots the flats which are predominately heather tundra. Bear use of the area is high during salmon spawning. H.H.



The remaining southwestern part of the Island is similar to the Ayakulik River flat but with even less brush and woody species and an increase in ponds and moist tundra. H.H.

C. Mammals and Non-Migratory Birds and Others

1. Game Mammals

a) Alaska Brown Bear

1) General

Information and data are still being sorted, analyzed, and incorporated into a Refuge history and compendium of Refuge bear research to date. This information, along with ongoing computerization, analysis, and correlation of kill and survey data will be used to examine current brown bear management, and to indicate means and methods to improve surveys and other management methods in the future.

Several delays have placed computerization and analysis of harvest and survey data far behind the original schedule. Data are now being coded for computer analyses of surveys and preliminary computer runs of harvest data have begun.

Two general objectives appear foremost from the Refuge history and compilation of past research: One is to improve aerial surveys or find another survey technique which relates to the population more precisely; the second is to initiate a comprehensive system to handle and store past, present, and future harvest data and correlate it to surveys and other monitoring information.

A brown bear management plan is being completed on the basis of currently available information. Hopefully modifications in the form of improved monitoring techniques and harvest data analysis will be forthcoming.

2. Population Surveys

Aerial composition surveys are flown annually on selected salmon streams and alpine areas. Most of the survey routes were originally chosen by trial and error in the early 1960's for their numbers of visible bear.

The goal of aerial surveys is to assess population composition and trends. However past analysis methods and survey techniques appear capable only of establishing compositions in the broadest sense and can indicate only very large population trends over a span of several years. Reliability is poor because variation is extremely large.



Brown bear feed extensively in high alpine meadows on sedge during early summer. This high carbohydrate diet appears especially important to nursing sows. G.A.



Lush growth of elderberry during late summer attracts bears away from spawning salmon. G.A.

As stated in last year's report a hard look at aerial surveys over the years indicates they should either be abandoned or improved. Since these surveys have numerous advantages over any other known alternatives for establishing compositions and population trends it is obviously worthwhile to examine them exhaustively before they are abandoned. Preliminary hand analyses indicate improvements are possible in analysis. The computer will be used to accomplish a more thorough analysis and, hopefully, aid in refining survey techniques.

Both stream and alpine surveys were flown this year. Numbers of bears counted and compositions are shown in Table No. 6. Comparing this year's surveys with past surveys discloses nothing abnormal. Production appears to be within the normal limits for the surveys. Total bear numbers were down somewhat on streams, but also within past normal variations. Lower numbers on streams may have resulted from the weather and plant growth pattern during the season, coupled with the timing of the survey.

Bears feeding in alpine areas departed approximately two weeks earlier this summer than the average departure date found by Atwell during an alpine bear study on the Refuge. Surveys indicate that females with young began departing alpine feeding areas before 7/18/79; a count on that date was shifted toward single bears. A later count on 7/26/79 found few bears remaining in alpine areas. Discussions with Kodiak charter pilots who routinely see bears during flights indicated bears had departed the alpine by about 21 July.

The early departure date from the alpine is logical considering the warm relatively sunny summer which caused rapid regression of the lower than normal snowpack. The above factors combined to make alpine growing conditions ideal very early in the year. The sedge emergence phase, which is the primary alpine bear food ended earlier than normal.

Stream surveys were begun during the last week in July, which in the past has been about the peak for bear concentrations on salmon streams. However, during the first surveys relatively large numbers of already spawned-out dead salmon were present. The highest concentrations of bears usually occurs before peak salmon berries already turning color were noted the week before stream surveys began. Both Clark and Troyer (Refuge reports and files) documented that a considerable proportion of fishing bears will switch to berries

Table 6. Aerial Composition Surveys - 1979

<u>Alpine*</u>		
Class	Number	Percent of Total
Single bears	20	22.2
Sows w/1 cub	2	2.2
Sows w/2 cub	8	8.8
Sows w/3 cubs	4	4.4
Sows w/4 cubs	0	
Total cubs of year	30	33.3
Sow w/1 yearling	0	00.0
Sow w/2 yearlings	6	6.6
Sow w/3 yearlings	2	2.2
Sow w/4 yearlings	0	00.0
Total yearlings	18	20.0
Total Bears	90	100.0%

Average litter size - COY =
 Average litter size - Yearling=

*Includes one count of Uyak, Uganik, and Terror on 7/11/79 thought to be the most representative.

<u>Stream*</u>		
Class	Number	Percent of Total
Single bear	38	53.5
Sow w/1 cub	3	4.2
Sow w/2 cubs	3	4.2
Sow w/3 cubs	0	0.0
Sow w/4 cubs	0	0.0
Total Cubs of year	9	12.7
Sow w/1 yearling	2	2.8
Sow w/2 yearlings	2	2.8
Sow w/3 yearlings	2	2.8
Sow w/4 yearlings	0	0.0
Total yearlings	12	17.0
Total Bears	71	100.0%

Average litter size - COY =
 Average litter size - yearling =

*Includes one 7/30 evening count and one 7/31 evening and morning count of Dog Salmon, Sturgeon, Pinnel Creels, Fraser-Red, and Connecticut Creek surveys.

when they become ripe even though salmon are still available in large numbers. After this shift bears alternate either daily or at intervals of several days between berry and salmon feeding. Low stream water levels occurred this year also, perhaps making salmon fishing success greater and thereby further shortening salmon feeding duration.

It seems reasonable to conclude that the lower bear concentrations seen on streams this year indicates the switch to berries occurred prior to stream surveys rather than there being fewer bears.

3) Mortality

a) Hunt Data

This is the fourth year that Kodiak brown bear have been hunted under a State permit system established by cooperative agreement between the FWS and Alaska Department of Fish and Game (ADF&G). Current Refuge hunting seasons are October 25 to November 30, and April' 1 to May 15.

Current bear management is based predominately on past kill data. Undoubtedly this is the best management information available. Unfortunately this information is most valid for the population as it appeared 3 to 6 years in the past and can be obscured and complicated by a great many factors besides the actual bear population. Known mortality from 1951 to the present has consisted predominately of sport harvest. During the past 5 years approximately 95% of the kill has been due to sport hunting.

Several minor changes in the State's permit hunt have occurred since it began in 1976. None have resulted in major differences in kill. However, success rates have increased over these four years until the total kill for ADF&G's Unit 8 approached their recommended maximum of 140 bears (Unit 8 includes Kodiak, Afognak, Raspberry, Shuyak, and other smaller islands in the Kodiak group). In 1979 the Kodiak Refuge total kill of 104 animals comprised 75% of the Unit 8 bear kill of 139 animals.

Known Refuge kill has increased from 88 to 104 animals (18.2%) from 1976 to 1979. The Refuge consists of approximately 2½ of the State's 5 subunits located on Kodiak Island (see map # 5). This year's kill was 5 animals above the recommended maximum take in subunit 5, southeast Kodiak, which has a quota of 20 animals. Last year subunit 4, southwest Kodiak, had a kill of 67, 14 animals over the recommended maximum of 55. Kill in subunit 4

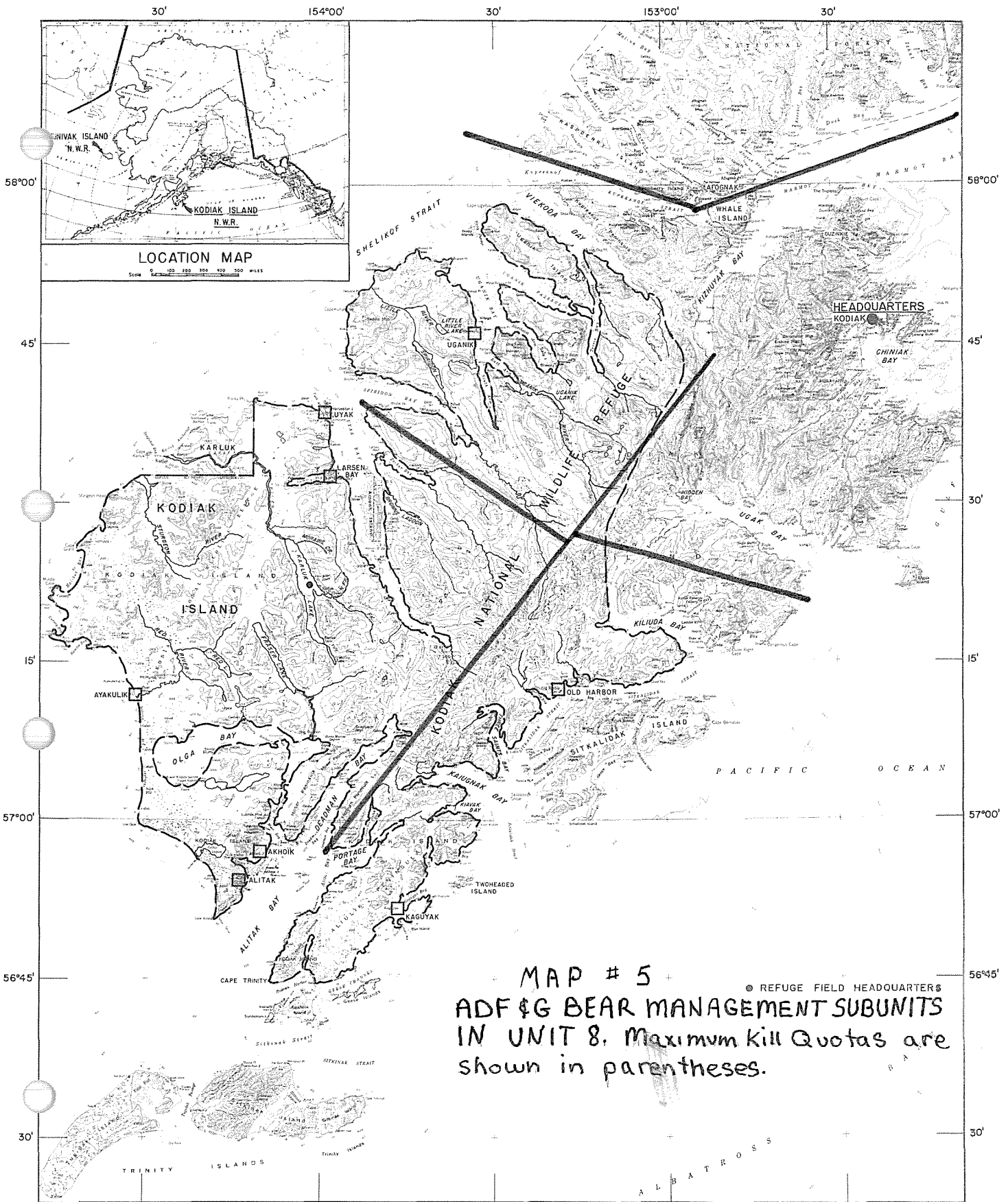
KODIAK ISLAND NATIONAL WILDLIFE REFUGE

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UNITED STATES
DEPARTMENT OF THE INTERIOR

ELECTION DISTRICT NO. 13 — KODIAK, ALASKA

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



MAP # 5
ADF&G BEAR MANAGEMENT SUBUNITS
IN UNIT 8. Maximum Kill Quotas are
shown in parentheses.

COMPILED IN THE BRANCH OF ENGINEERING
FROM SURVEYS BY U.S.G.S. AND NATIONAL
PARK SERVICE

PORTLAND, OREGON

AUGUST 1964

SEWARD MERIDIAN

Scale 400 0 400 800 1200 1600 2000 CHAINS
5 0 5 10 15 20 25 MILES
CONTOUR INTERVAL 200 FEET DATUM IS MEAN SEA LEVEL

6	5	4	3	2	1
7	1	9	10	11	12
13	17	18	19	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

TOWNSHIP
DIAGRAM

TRUE NORTH
MAGNETIC

MEAN
DECLINATION
1962

6R ALA 358 404

dropped to 52 animals this year.

It is apparent that hunter success rates are going up. In the future permit cuts or other modifications will probably be required to stay within the recommended maximums. No changes were proposed this year.

Weather has a great deal to do with hunter success on Kodiak. Bad weather can cause a pronounced drop in hunter kill caused by access problems and poor hunting weather. Weather was close to optimum for hunting this year, with good spring hunting and fair to good fall seasons contributing to the near maximum recommended overall harvest.

No pronounced trends are apparent when kill data from the past 4 years are broken down by residency. (Table No. 7). Since 1976 permits are allocated by the State 60% to residents and 40% to non-residents. Before that time a first-come, first-served permit system resulted in progressively more permits being issued to non-residents (guides).

Table No. 7 Kodiak National Wildlife Refuge Bear Kill by Hunter Residency

	YEAR									
	70	71	72	73	74	75	76 *	77	78	79
Resident	25	33	39	42	32	14	33	36	45	35
Non-Resident	38	37	53	85	98	63	55	65	63	69
Total	63	70	92	127	130	77	88	101	108	104
% Non-Resident	60%	53%	58%	67%	75%	82%	62%	64%	58%	66%

* State Permit Program Begun

One possible trend is apparent in 1976-1979 kill data. Table No. 8 which lists total known Refuge kill by sex, hunter residency, and split season shows a gradually increasing female kill. Under the heading "Male and Female Kill" it is apparent that fewer males were actually killed in 1979 than in 1976 even though yearly kill has increased by 14 animals. This is somewhat misleading in that the numbers are small and subject to fairly large variations. However it is apparent from the table that the number of females in the kill has risen steadily from 26 to 44 animals. The table also indicates that the greatest increase in female kill occurred in the spring seasons for both resident and non-resident hunters.

Table No. 8 TOTAL KNOWN REFUGE KILL BY SEX, HUNTER RESIDENCY, AND SPLIT SEASON

FEMALE KILL								
Year	RESIDENT HUNTERS				NON-RESIDENT HUNTERS			
	Spring		Fall		Spring		Fall	
	No.	% Yearly Kill	No.	% Yearly Kill	No.	% Yearly Kill	No.	% Yearly Kill
1976	8	9%	4	4.5%	8	9%	6	6.8%
1977	7	6.9%	8	7.9%	13	12.8%	4	3.9%
1978	16	14.8%	5	4.6%	15	13.9%	7	6.4%
1979	14	13.5%	5	4.8%	15	14.4%	10	9.6%

<u>MALE AND FEMALE KILL</u>					<u>TOTALS</u>	
Year	All Hunters				No.	% Yearly Kill
	Female		Male			
	No.	% Yearly Kill	No.	% Yearly Kill		
1976	26	29.6%	62	70.4%	88	100%
1977	32	31.6%	69	68.4%	101	100%
1978	43	39.8%	65	60.2%	108	100%
1979	44	42.3%	60	57.7%	104	100%

(Unknown sexed animals not included)

Changing sex ratios are one of the more apparent aspects of past Kodiak sport hunting data. Table 9 shows Kodiak Island kill data from 1961 to 1977.

Table No. 9. Kodiak Island Sport Kill by Sex*

Source: ADF&G Computer Print from Sealing Certificate Data

YEAR	MALES	FEMALES	TOTAL BEARS	% FEMALE
1961	68	37	105	35.2
1962	75	38	113	33.6
1963	63	25	88	28.4
1964	69	41	110	37.2
1965	87	59	146	40.4
1966	100	79	179	44.1
1967	93	68	161	42.2
1968	52	37	89	41.6
1969	50	28	78	35.9
1970	54	23	77	29.9
1971	56	39	95	41.0
1972	70	47	117	40.2
1973	80	64	144	44.4
1974	86	65	151	43.0
1975	64	43	107	40.2
1976	68	30	98	30.6
1977	73	32	102	31.4

Kodiak Island kill is used here as representing trends for Kodiak Refuge since accurate tabulations for all years previous to 1976 are not currently available for the Refuge. Refuge kill generally constitutes about 90% of these figures. Twice during the period 1961 - 1975 harvest was determined to be excessive. In 1966-67 an overkill occurred primarily in the southwestern area of Kodiak Refuge, around Karluk Lake. In 1973-74 overall kill for the Refuge was judged excessive. During both these periods females constituted over 40% of the kill. The 1979 kill of females exceeded 40% of the total kill on the Refuge and therefore requires careful watching.

b) Non-Sport Kill

Three known non-sport kills occurred on Kodiak Island during 1979, all on the Refuge. All of these were in defense of life or property (DLP).

On May 8 an off-island Alaska resident killed a male bear three miles south of Grants Lagoon. Both other kills occurred during the fall.

A resident of Old Harbor killed a female bear which charged his companion near the village. The female was accompanied by three cubs-of-the-year. Fate of the cubs is not known, but their chances of survival are minimal.

The last DLP kill occurred at Chief Cove, Uyak Bay on October 31. Three Alaska residents were deer hunting from a FWS recreational cabin. A bear was attracted by deer hanging in a tree. The deer hunters killed the bear when it remained in the area. They stated the bear posed a threat to them.

The growing number of deer hunters, along with other increased public use can only increase DLP kills in the future.

c) Other Mortality

Only two other bear mortalities are known on the Refuge this year. One dead cub was washed ashore at a setnetter's cabin in Uyak Bay. The fisherman said the cub's abdomen was open and intestines were pulled out. The carcass was fresh. Another dead cub was found by ADF&G fisheries personnel on Thumb River in early August. No gross injuries were apparent. FWS personnel at Camp Island were notified and arrangements were made to bring the carcass in for necropsy. However an airplane breakdown prevented flying out before the carcass decomposed.

Two apparently orphan cubs were seen by several fishermen in the Uganik Bay area. These probably will not survive the winter.

d) Marked Bear Returns

During the extensive marking program that was done from 1957 through 1975 about 300 bears were marked. Of these 183 were never encountered again. Since most of these 183 marked bears were recovered in the sport kill within four years a high tag loss rate is apparent. However, a female killed (sealing certificate No. 29571) this spring had one remaining cattle-type metal tag, No. 536, in the right ear. One tag edge was worn to knife sharpness and no tattoos were visible on the hide. This female was originally trapped on Meadow Creek, Karluk Lake, as a yearling on July 26, 1959. She was

recaptured on July 14, 1961 at Grassy Creek, Karluk Lake, about 6 miles down the lake shore. When killed on April 25, 1979 she was at Tree Point, about 4 miles down the lakeshore from the original capture site. This is the longest interval between initial marking and return and one of the oldest known age bears killed since cementum aging began on all sport kills.

b) Sitka Blacktail Deer

Deer populations throughout the Kodiak Archipelago are currently very high. Three winters with little snow and mild temperatures, coupled with good growing seasons, have ensured almost total overwinter survival and near optimum reproduction. Kodiak's deer population is the highest it has ever been. Large scale range expansions have taken place south and west onto the Refuge. Deer now occupy virtually all suitable habitat on the island.

The 1978 deer harvest on the Refuge was estimated conservatively at 1500. Surveys for this year are not in yet, but all indications are for a greatly increased kill. Estimates run 2000 to 2500 animals, with about 70/30 buck-doe ratio. Even these high harvest levels undoubtedly will have little impact on the population as a whole.

Browsing pressure in several coastal areas was apparent. In very limited cursory browse examinations, dubbing, and other signs of heavy browsing and overall deer concentrations were apparent.

c) Mountain Goat

The goat population was estimated to be 200 to 250 animals in 1978. All indications are the population is continuing to expand in numbers and range. Several sightings in 1978 and 1979 indicate goats are expanding into areas southwest of their present ranges, which center around the Hidden Basin area just off the eastern Refuge boundary. Nineteen goats were originally introduced in this area in 1952 and 1953. Most of the population is still located off the Refuge.

Goat surveys were conducted in August by ADF&G in the Crown Mountain area and later by ADF&G and FWS in the Terror Lake area. The survey consisted of a combined fixed wing and foot effort which covered only high density goat areas. In 1978 - 132 individuals were counted from a helicopter after which selected groups were classified on foot. Less aerial coverage was done this year, and more foot travel. This year's combined count was 129 animals. Compositions were as follows:



The introduced mountain goat population is expanding and continues to be observed further south and west and the Island each year. M.V.

The bald eagle population has remained stable throughout the refuge history at approximately 200 nesting points. The wintering population in the city of Kodiak has been increasing over the past several years, however, deaths from shooting and electrocutions are on the increase. Cannery discharges and the attraction of forage fish near the canneries seem to account for the increased wintering birds near the city. G.A.



No. Adults	No. kids	No. Unclassified	Total	Kids/100	
				Adults	% Kids
94	30	5	129	32/100	24

These figures are very close to last year's 35/100 kids to adult ratio, and 24% kids.

Nine goats were taken in 1978 and 11 were taken this year. The 11 goats in 1979 consisted of 6 males, 4 females, and one of unknown sex. Age breakdown is not currently available.

d) Reindeer

In September 1979 a survey was flown which covered most of the reindeer range in a manner adequate to locate all large (5+) animal concentrations. Single animals may have escaped notice. Approximately 135 animals were seen. Conditions were not suitable for composition counts; therefore no sex or age breakdown was made.

This count compares closely to the 1978 count of 129 animals and it appears that a population of 140 to 160 is probably a fair estimate of herd size. During both recent surveys very few calves have been seen. This scarcity of calves is supported by the observations of a bear guide who operates in this area. The guide, an astute observer who has experience in classification and census work, saw about 30 calves per 100 adult animals during the spring of 1978 and only one calf in the fall. Thus it appears that calf mortality is high.

2. Other Mammals

a) River Otter

Seventy-eight otter were sealed from the recently established ADF&G sub-units on the Refuge in the 1978-79 season. Trappers operating under permit on the Refuge reported taking 28 otter during this period. Obviously trapping without a permit, and/or not reporting otter is common. Sex breakdown is as follows: Male - 37; Female - 39; and unknown - 2.

b) Red Fox

More fox are trapped on the Refuge than any other species. Trapping permit reports listed 171 fox taken in 1978-79. This is undoubtedly a very conservative number.



The introduced beaver population is definitely on the increase. They are currently found on all suitable drainages on the Island. They often locate on major salmon drainages and have to be removed to allow spawning salmon passage. Benefits accrue to a wide range of wildlife species from beaver activity. Accurate distribution and location surveys as well as effects of the beaver activity will be initiated this year. H.H.



The feral reindeer herd continues to show a downward population trend. Their numbers are below 200 and very little recruitment is evident. Poor genetic stock as the result of years of inbreeding probably accounts for their decreasing numbers. H.H.

c) Beaver

Twelve beaver were reported taken in 1978-79. Again this is probably a conservative figure.

Current beaver populations are high. New dams, many at high elevations, are apparent from the air in many Refuge areas. ADF&G personnel have again cut several dams to re-establish salmon passage to spawning areas. However, several dams were located intact in late summer-early fall which may have had an impact on spawning salmon.

Field work on a study to determine the impacts of beaver on other wildlife species and the habitat will begin in 1980. Initial field surveys will attempt to locate the majority of beaver impoundments on Refuge and follow-up work will evaluate the impacts and, hopefully, provide guidance of whether control activities are warranted or even desirable.

d) Raccoon

Raccoon were introduced to Uyak Bay in 1974 by a local guide. During 1978-79 at least 4 raccoons were taken by trappers in Uyak Bay. Trapper's reports for 1979-80 are not yet in, but several sightings were reported this year.

Personnel from Animal Damage Control will visit Kodiak in spring of 1980 to attempt initial control efforts on raccoon and to determine the feasibility of a total eradication effort.

e) Tundra Vole

This species is the only small mammal herbivore on Kodiak. Vole populations, in line with the excellent growing season and lush vegetation produced, appeared very high in all locations where suitable habitat was examined. cursory examinations were done in several locations, mainly around Camp Island Field Headquarters, and some southern Refuge areas.

3) Other Animal Lifea) Anadromous Fish1) Sport Fish

The Karluk River supports the greatest sport fishing effort of all the Refuge watersheds. Species attracting annually increasing numbers

of fishermen include chinook, coho, and sockeye salmon, plus dolly varden and steelhead trout.

Biological Aide Lupe Lopez, and Biological Technician Dennis Zwiefelhofer, floated the entire Karluk River on June 27-29. Four large bags of litter were picked up at favored camping spots along the river. Campers and fishermen don't always follow the "take it out if you brought it in" rule.

All fishermen encountered were censused as to their success and fishing effort. Scale samples were taken from all chinook salmon that fishermen had in their possession. The fish were also measured, weighed, and sexed. This information was turned over to the Alaska Dept. of Fish and Game in conjunction with an existing cooperative work agreement for chinook salmon data collection. Chinook salmon numbers have been slowly increasing in the Karluk River system.

2) Commercial Fish

The Fisheries Rehabilitation Enhancement and Development Division (F.R.E.D.) of the Alaska Dept. of Fish and Game has been attempting to restore the Karluk Lake sockeye salmon population of its former abundance through egg takes and a planting program. Failure of ADF&G to coordinate its F.R.E.D. and Commercial Fisheries Divisions so that the brood stock from the planted Karluk Lake sockeye salmon were protected from the late season commercial fishing periods led the Fish and Wildlife Service to review the entire program.

Meetings between both agencies (ADF&G and FWS) were held throughout the year to develop an acceptable cooperative program. The 1980 proposal is still under review. A more detailed explanation of the factors relating to the Karluk sockeye salmon can be found under the Field Investigations portion of this report.

The Kodiak National Wildlife Refuge provides spawning habitat for the majority of the salmon species caught in the Kodiak commercial fishing districts. Protection of these watersheds, combined with realistic harvest management, is necessary to insure continued healthy and abundant salmon populations. Reference Table No. 10 regarding preliminary 1979 Kodiak area salmon returns.



Working with the local ADF & G personnel and the state environmental office we were able to convince the New England Fish Company to cover and abandon their use of a open garbage dump. They have relocated the dump on an Island off-shore which they own. The old dump site has been the demise of several brown bear in the past due to encounters with cannery personnel. The refuge boundary is immediately adjacent to the cannery and dump.



The second fish ladder on Dog Salmon Creek was put into operation this year by F.R.E.D. A total of 126,742 red salmon passed through the two ladders to reach spawning grounds in Frazer Lake and tributaries. H.H.

Table No. 10 Preliminary 1979 Kodiak Area Salmon Returns

SPECIES	CATCH	ESCAPEMENT	TOTAL
Pinks	10,756,000	2,783,000 Excellent	13,539,000
Chums	348,000	615,000 Good	963,000
Sockeye	556,000	1,150,000 Relatively Good	1,706,000
Coho	134,000	85,000+ Excellent	219,000
Kings	2,774	14,441 Excellent	17,215
Total	11,796,774	4,647,441	16,444,215+

V. INTERPRETATION AND RECREATION

Visitor use increased over previous years due to a combination of good weather, increased facilities, and the spread of word that the Archipelago has a very high deer population, long season, and liberal bag limit of 4 deer. Although there are no roads on the Refuge, four air charter operators put the Refuge in reach of the public. Kodiak Island is also served by two major airlines with non-stop flights from Seattle and Anchorage. The State ferry Tustumena serves Kodiak from Homer and Seward.

A. Information and Interpretation1) On-Refuge

The Refuge does not have a visitor center or any established trails. Future plans call for a visitor center at the BLHP funded headquarters complex to be constructed in FY 1980.

A draft Refuge brochure for Kodiak, as prepared by Area Office personnel was reviewed and sent back to I&R with our comments.

During "Wildlife Week" Mike Rearden sent a packet supplied by the National Wildlife Federation to all village and town schools. A student from the local high school spent one week in our office as part of her high school program. She plans a career in Conservation, and her visit to our office was part of the school's CE-II program. An employee of the State Division of Parks requested information on recreation areas of concern on the Refuge for a publication they are writing. Rearden spent several days with her securing this information. A draft copy was received and commented on by the Refuge staff.

On April 3 the Uganik, Ayakulik, Terror and Spiridon rivers were proposed for inclusion in the National Wild and Scenic River System. The Karluk River was previously proposed in October of 1972.

2) Off-Refuge

Manager Bob Delaney gave a talk to the local Rotary Club informing the members about the Refuge and explained the Refuge's position on the proposed Terror Lake hydroelectric project.

A survey of set-net fishermen who use cabins on refuge lands was taken in Spring of 1979. The questionnaire covered a variety of questions in an effort to gain feedback on our permit system. Most of the respondents had no major problems with the current system, including the recently established cabin size limitations which limit total cabin size to 450 square feet and single story structures only. Cabins which currently exceed these limitations will be exempted, except that no future additions will be allowed. Any replacement cabins or additions to existing cabins may not exceed the limitations.

One question asked the respondent's opinion of allowing recreational use of all cabins outside the fishing season. Currently no use is allowed outside the commercial fishing season, even by the cabin owners. Nearly all respondents objected to public use of their cabins for a variety of reasons including liability, vandalism, etc.

Several news releases have appeared in the local papers. These included an article on bald eagles, emphasizing the penalties for harming them and the illegality of possessing parts. Our phone number was listed to assist information gathering from the public. Another article explaining regulations concerning the use of aircraft, boats, and motor vehicles on the Refuge and a news release describing the 12 Refuge recreation cabins and reservation procedures was submitted and printed. The Mile-Post magazine had an article describing the Refuge and its facilities.

A flood of requests for information on bear hunting was received in November. Most of this was generated by a short article in the October issue of Outdoor Life which had been submitted by a local bear guide.

The Refuge has three 30-minute films about Kodiak Island, the Aleutians, and Alaska in general that were used by the staff and civic organizations for various presentations.

Bill Thomas, an outdoor writer, preparing a new book on coastal areas of the U.S., was given a tour of Chiniak Bay by Mike Rearden, where he took photos of tufted and horned puffins for the book.

B. Recreation

1. Wildlife Oriented

a) Hunting

Visitors from all over the world came to the Kodiak National Wildlife Refuge to view and/or hunt the famous Kodiak brown bear.

Hunting regulations, including seasons and bag limits are set by the Alaska Dept. of Fish & Game with review and concurrence of refuge staff. The entire Refuge is open to hunting during the regulatory seasons. Besides bear, other species hunted included Sitka deer, mountain goat, reindeer, fox, ptarmigan, snowshoe hare, and waterfowl.

Hunter use was in excess of 20,000 activity hours, during the brown bear seasons most of which occurred in the spring hunt.

Deer hunting received much more use on the Refuge than any other activity. It is estimated that over 1500 deer were harvested on the Refuge during the 5½ month season. Many deer hunters use boats ranging in size from skiffs to fishing vessels for access. Some refuge recreational cabins sustain heavy use by deer hunters also. Of the 12 recreation cabins 4 had heavy deer hunting use. These were on salt water which allows better access in cold weather. Use was estimated to be in excess of 50,000 activity hours for deer hunting in 1979. The addition of 3 new recreational cabins on the salt water, and increase in boat use because of good weather, provided for the increase in use over previous years.

All other species hunted comprised a minor portion of the total use. Except for mountain goat hunting, all of these hunts were usually in combination with fishing or bear or deer hunting trips. Waterfowl hunting is good on some portions of the Refuge, but the expense of getting to good hunting areas discourages most hunters. Some deer hunters bring along a shotgun for ducks and ptarmigan.

b) Fishing

Again the Portage cabin on the Karluk River sustained the heaviest fishing use of all the cabins. This cabin is used almost constantly from May through October. The main attraction is king salmon from May through mid-July, and the world famous steelhead run starting in September and continuing through the fall. We are discouraging spring steelhead fishing on the Karluk River. Although legal, these are outgoing spawners and not a good sport fish at this time of the year. There is strong evidence that even catch-release fishing may inflict high mortality on the already stressed fish. Sockeye and silver salmon, along with the ever-present dolly varden, were usually incidental catches while fishing for the more popular king salmon and steelhead trout.

Of the eleven other recreation cabins eight receive moderate fishing use from May through September. There was no creel census in 1979 at the cabins which we used in previous years to determine use. Saltwater fishing, clamming, and crabbing occurred throughout the summer around the Refuge. Most of this was incidental to other activities, especially commercial fishing which occurs in coastal waters. Of the approximate 20,000 plus A.H., over 5000 A.H. was at the Portage on Karluk River.

c) Other Recreational Uses

One special use permit was issued for commercial photography in 1979. Nearly all visitors to the Refuge possess a camera. Amateur photography has to be considered one of the higher recreational uses on the Refuge even though it is not the main purpose for which the public normally visits. Economically, dollars spent on equipment, film, and processing of film related to a Refuge trip has to be significant.

Trapping permits are issued to anyone who possesses a valid State of Alaska trapping license. Trappers are required to turn in their catch numbers by species taken at the end of the season. Seventeen trapping permits were issued for the 1978-79 season. There have been eighteen permits issued for the 1979-80 season to date. The catch will not be known until spring. If beaver prices increase, catch figures should go up since they are plentiful throughout the Refuge.

Public Use by Activity Hours		
	1978	1979
Interpretation	10,650	12,080
Education	0	0
*Hunting	43,846	50,000+
Fishing	21,870	24,060
Other Wildlife Rec.	3,000	3,500
Non-Consump. Rec.	10,990	22,900
Total Public use	90,356	112,540+
* Deer hunting use was under estimated in earlier reports		

1979 Special Use Permits	
Trapping	17
Commercial Photography	1
Aircraft	7
Collecting	1
Field Investigation(Terror Lake)	1
Fish Ladder	1
Commercial Set Net Cabins	62
Commercial Set Net Tent	8
Commercial Guide Cabins	7
Total Permits	105

Public use increased significantly this year. This was mainly due to the good summer weather and three additional recreation cabins that were ready by deer season. Increased use of the Karluk River system was noticeable. Eventually a permit system may be needed to preserve the quality of the area. Cost increases in just about everything, especially the cost of transportation, has not slowed down public use on the Refuge.

2. Non-Wildlife Oriented

Nothing significant to report. Virtually all recreational use on Kodiak is wildlife oriented.

C. Enforcement

During the spring bear hunt coastal bear camps on Kodiak's west and north sides were checked by Heffernan, who accompanied the State Fish & Wildlife Protection Patrol vessel Trooper. Vivion checked coastal camps on the east and south sides via F & W Protection's Grumman Goose and inland camps via N 720 and charter aircraft.

Enforcement checks of all SUP gill net sites were made during the fishing season via the FWS M/V Ursa Major, aircraft, and inflatable skiff. One permittee was cited for storing fuel drums on his site outside the fishing season. An individual was cited for conducting a commercial operation (set-net site) on the refuge without a permit.

Two individuals, one of whom was a dealer in Native Alaskan artifacts, were reported by local residents to be excavating Koniag midden sites in Uyak Bay. The two were extremely cautious and a surveillance effort netted only minor circumstantial evidence. The situation was reported to L.E. who requested a special agent in New York to conduct a follow-up check of the artifact dealers business in New York City.

Heffernan again accompanied the P/V Trooper on checks of coastal bear camps during the fall season. Inclement weather severely hampered the patrol.

Vivion assisted State Protection Officers on waterfowl enforcement of the local Kodiak area during the opening of the waterfowl season.

Special Agent in Charge Hogue and ASAC Hood spent 10 days in Kodiak for the opening of the late waterfowl season, and wrote 8 violations for over-limit, late/early shooting, no duck stamp, no license. These last two patrol efforts were off-refuge.

The size of the refuge and difficulty of access make law enforcement efforts difficult at best.

VI. OTHER ITEMS

A. Field Investigations

Dick Wilmot of the Alaska Field Station, National Fisheries Research Laboratory, completed his second year of field work on genetic variation in Karluk Lake sockeye salmon in 1979. Wilmont's study is designed to detect genetic differences in sockeye salmon spawning in the various tributary and terminal streams of the Karluk systems and provide information as to the risks involved in proposed rehabilitation efforts involving mixing of genetic stocks by ADF & G's Fisheries Rehabilitation, Enhancement, and Development (F.R.E.D) Division. Again this year Wilmot found only a small statistically insignificant differences in genetic stocks, but the differences were remarkably similar to those noted last year. This year duplication of results indicates that the subtle differences noted may not be artifacts as first assumed and thus may be more significant than they appear statistically.

Personnel of the National Fisheries Research Lab (NFRL), Seattle, continued their disease studies of Karluk sockeye this year, focusing primarily on the viral disease IHN. In 1978 IHN was isolated from Karluk king (chinook) salmon, which is the first record of this disease in Alaska king salmon. NFRL has also found that the standard diagnostic tests for IHN are somewhat unreliable, and part of their work at Karluk is to refine diagnostic procedures. At present it would appear that IHN is more prevalent than was previously believed.

Jack McIntyre, also of NFRL Seattle has agreed to complete a systematic analysis of the existing (and considerable) information on the Karluk drainage fishery and to make recommendations for future research and management approaches, including recommendations on proposed rehabilitation efforts. The Karluk sockeye salmon are probably the most intensively studied salmon run in North America, but much of the historical data appears to be somewhat contradictory and analyses are often somewhat biased.

Alaska Dept. of Fish & Game's Fisheries Rehabilitation Enhancement, and Development Division (F.R.E.D.) personnel continued their Karluk Lake Sockeye Rehabilitation project this year and by year's end had submitted a proposal to continue their efforts in 1980. A total of, approximately 1.5 million eyed eggs was planted in Upper Thumb River in late September. These eggs had been taken from spawners in Upper Thumb River on July 16 and 20. High water conditions at Upper Thumb prevented the planting of ad-

ditional eggs. All remaining eggs taken (2.4 million early run and 2.0 million late run) were flown to Kitoi Bay hatchery on Afognak Island for incubation to fry stage, when they will be flown back to Karluk and released. At this writing an IHNV epizootic has been observed in the early run eggs at Kitoi. All 2.4 million early run eggs are being destroyed to prevent spread or amplification of the virus in Karluk. It is not known whether the epizootic will also spread to the late run eggs held at Kitoi.

F.R.E.D. personnel operated a sonar smolt counter approximately two miles down river from the outlet of Karluk Lake. Approximately one million outmigrant smolt were enumerated in 1979. This number is extremely low, but is probably a function of new equipment, new operators, etc. This was the first trial of this technique on Kodiak, and obviously they've got a lot of improving to do.

ADF & G commercial fish biologists conducted their annual pre-emergent fry sampling operation in selected refuge streams. This program allows relatively accurate predictions of pink salmon runs in future years. The sampling crew uses a helicopter for transporting themselves and their gear.

B. Cooperative Programs

Kodiak Coast Guard Air Station transported two prefabricated FWS recreational cabins to construction sites on Viekada Bay and Frazer Lake with Sikorsky H-3 heavy turbine helicopters. The Coast Guard has been quite cooperative in providing heavy lift helicopter support for State and Federal agencies in the area. Several SUP's for helicopter landings were issued to the Coast Guard to allow these cooperative ventures to progress.

A special use permit for helicopter landings was issued to USGS to service stream gauges on the Refuge. Another was issued to BLM to permit support of cadastral survey crews surveying Native allotments, and another to the Federal Energy Regulatory Commission to access the Terror Lake basin on an inspection tour.

The Arctic Environmental Information and Data Center (AEIDC) was issued a special use permit to conduct environmental studies of the Terror Lake area under contract to Kodiak Electric Assn. (KEA). The Alaska Area Director determined that the Terror Lake hydro project was incompatible with the purposes for which the refuge was established. KEA appealed that decision to Director Greenwalt, who authorized further environmental studies to be conducted pending his determination on the appeal.

C. Items of Interest

In 1979 two major additions to Kodiak's equipment inventory greatly improved mobility and flexibility of scheduling field operations.

The 48-foot motor vessel Ursa Major completed her first operational field season for the Fish & Wildlife Service in 1979. This is the first year since 1972 that a boat larger than a skiff has been in year-round use at Kodiak, and the Ursa Major demonstrated her utility in a variety of tasks this year, including hauling fuel and construction materials, law enforcement patrols, and seabird surveys.

In addition to Piper Super Cub N720, Cessna N748, a float-equipped Cessna 185 was assigned to Kodiak this field season. This was the first field season that Kodiak has had two aircraft, and the first time an aircraft larger than a Supercub was assigned to Kodiak. The combination of the Supercub's patrol and survey capabilities and the 185's load carrying ability virtually eliminated our use of air charters this year.

Commercial air charter costs at Kodiak have exceeded \$23,000 in some past years. Even counting all costs (OAS availability, hourly rates, fuel, pilot's salary) of FWS aircraft, we estimate that our aircraft operation costs will average approximately \$10,000 per year less than commercial charter. Additional benefits are the elimination of the massive scheduling problems encountered with charter operators, added flexibility, elimination of standby charges and more work accomplished per dollar spent on aircraft time.

Cessna N-1055F, a 185 on amphibious floats, was stationed at Kodiak from early December on, providing maximum flexibility (wheels or floats) after freshwater freeze-up.

An Alaska Refuge Managers' workshop was held at Camp Island Field Headquarters from July 28 through August 4. In attendance were Mark Nelson, Chief of Refuges; Keith Schreiner, Alaska Area Director; Jan Riffe, Assistant Area Director; Don Redfearn, Alaska Refuge Supervisor; several other Area Office staff personnel and Refuge Managers from all Alaska refuges. Discussions centered on F&WS policy in Alaska--past, present and future, as well as the problems that affect refuge management in Alaska.

An old cabin on Refuge lands on the west shore of Uyak Bay was discovered by Refuge personnel this season. The cabin has been there for some time but has remained undiscovered due to dense brush and trees. The land on which the cabin lies has been claimed under provisions of the 1906 Native Allotment Act.



Forty-eight foot M/V Ursa Major on enforcement patrol of special use permitted salmon set gill net sites. The recent acquisition of this 45 year old boat from the FAA has greatly increased our mobility and management efforts on the Island. M.V.



The addition of a cessna-185 to our fleet has eliminated the necessity of expensive chartering to haul supplies, equipment, and personnel to interior and coastal field camps. R.D.

On 22 November the Sealand vessel Trans-Pac sank alongside the State ferry dock in Kodiak, while fueling. Coast Guard crews established containment booms and mopped up over 12,000 gallons of fuel oil. High winds and rough water rapidly dispersed the fuel that escaped clean-up efforts. No oiled birds were found by F&WS personnel.

Thomas Emerson entered on duty as Vessel Master/Maintenanceman April 9. Tom has a broad background in boat operations in Kodiak waters. He was formerly employed by the State's Division of Fish and Wildlife Protection, as master of the Patrol Vessel Trooper.

Native Liaison Specialist Mike Rearden, went on extended LWOP status on August 27 to return to school in Fairbanks. Mike will return in May, 1980 after completing requirements for a degree in Wildlife Management.

Clerk-typist Karen Hawley, departed Kodiak on LWOP status September 21. By year's end Karen had transferred to the OBS office in Fort Collins, Colorado as a mail clerk.

Donna Coleman was hired as clerk-typist and entered on duty on December 2.

Assistant Refuge Manager (Trainee) Ed Hajdys, attended the Basic Refuge Manager's Academy in Beckley, West Virginia in February/March.

The following staff members completed sections of this report as noted below:

Delaney	-	Sec. I & II & III
Vivion	-	Sec. VI
Heffernan	-	Subpart C of Sec. IV
Hajdys	-	Sec. V
Zwiefelhofer	-	Subpart A & B of Sec. IV, fisheries section of subpart C, Sec. IV

Delaney and Vivion edited the entire report. Dorothy Dryden converted everyone's illegible handwriting into a typed first draft, then final typed the edited report. Photo credits (if other than FWS photos) are noted in captions.

D. Safety

No lost-time accidents occurred in 1979.

Safety meetings were conducted on various topics throughout the year.

Virginia Hyatt, Alaska Area Safety Officer, visited Kodiak the week of June 4, 1979. During her visit Ginny conducted a station safety inspection, presented a National Safety Council Defensive Driver's course, and taught a Redcross Basic First Aid course. Thus, all Refuge personnel were brought up-to-date on Defensive Driver's training and first aid currency.

Discrepancies noted in the safety inspection were corrected.

Aircraft survival kits were repacked and updated, and the emergency locator beacon in N-748 received a fresh battery.

A new improved antenna for the HF radio at Camp Island was installed to provide more reliable long range communications from this remote field camp.

E. ANCSA

The primary emphasis in ANCSA this year was an effort to complete cooperative agreements with the five Native villages which have selected lands from the Refuge. Despite numerous contacts and meetings with Village Corporation members this year, including a meeting between board members of all five villages and Refuge staff on 22 March, little progress was made towards completing the agreements. Koniag, Inc. (the Regional Native Corp.) also encouraged Village Corporations to move forward in this effort by sending letters to all Corporation presidents. Koniag received no replies from the villages. Unfortunately in the short term at least, such agreements are more important to the Fish & Wildlife Service than they are to the villages. Until the villages can see some definite direct benefits that might derive from cooperative agreements it is quite likely that this apathy will continue.

A biological evaluation of private inholdings (Native Selected lands) was initiated in 1979. Preliminary evaluations were completed and will remain the state of the art until detailed habitat mapping and extensive in-depth evaluations are completed. These would be very costly and time consuming tasks. Funding and manpower are not available in the foreseeable future, and in any case it is questionable whether such a detailed analysis would be significantly more accurate than the evaluations completed this year.

Rearden met with Kodiak Area Native Association personnel several times on subsistence-related matters on Kodiak Island.

Extensive discussions occurred between Refuge personnel and BLM on the status of recreational easements requested under ANCSA. A rulemaking released this year essentially prohibits the reservation of public recreational easements from Native selected lands. BLM must now examine each requested easement and conform

Minke whale which was entrapped in floating trawl webbing was discovered in Uyak Bay. Local Natives had already harvested the blubber off the whale when we discovered the animal. Numerous otter, seal, and sea lions, etc., have been observed by trappers, fishermen, and refuge personnel entrapped in fishing webbing along the 800 mile refuge shore-line over the past year. It appears to be an increasing problem. H.H.



Aerial view of the Native Village of Karluk on the west side of the Island. New BIA financed housing is located in right center of the print. All the refuge located Native villages received new housing units this year. A severe January storm in 1978 caused water to breach the Karluk Spit as shown in the foreground. Heavy silting of the lagoon is resulting from the breach. H.H.

it to this rulemaking, which is obviously a massive task. Until an easement is conformed it is assumed to be valid even though it was obviously requested for public recreational purposes. Refuge personnel discussed this situation with representatives of all villages.

None of the villages objected to the Refuge continuing management of recreational easements until they can be conformed to the ruling.

Tensions and legal maneuvering between the village of Akhiok and the Kodiak Island Setnetters Association continued this year. Both parties appear reluctant to force the issue into court, however.

This years SUP's for setnet sites on Native selected lands were issued by the Refuge office with the concurrence of the Native villages involved. This procedure works efficiently, is totally acceptable to the villages, and conforms to Sec. 22(G) of ANCSA.

Vivion returned on August 10 from a two week detail to Central Office, assisting in preparation of an environmental assessment for a proposed Alaska Peninsula National Wildlife Refuge, incorporating Sec. 14(e) lands and other National Interest Lands.