Assoc. Supvr

REFUGE NARRATIVE REPORT

1968

KODIAK NATIONAL WILDLIFE REFUGE

KODIAK, ALASKA

US FISH & WILDLIFE SERVICE--ALASKA
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Regional Supervisor, Division of Wildlife Refuges, BSF&W, Portland, Oregon

February 12, 1969

Associate Supervisor, Alaska Wildlife Refuges, BSF&W, Anchorage, Alaska

Kodiak Narrative Report - 1968

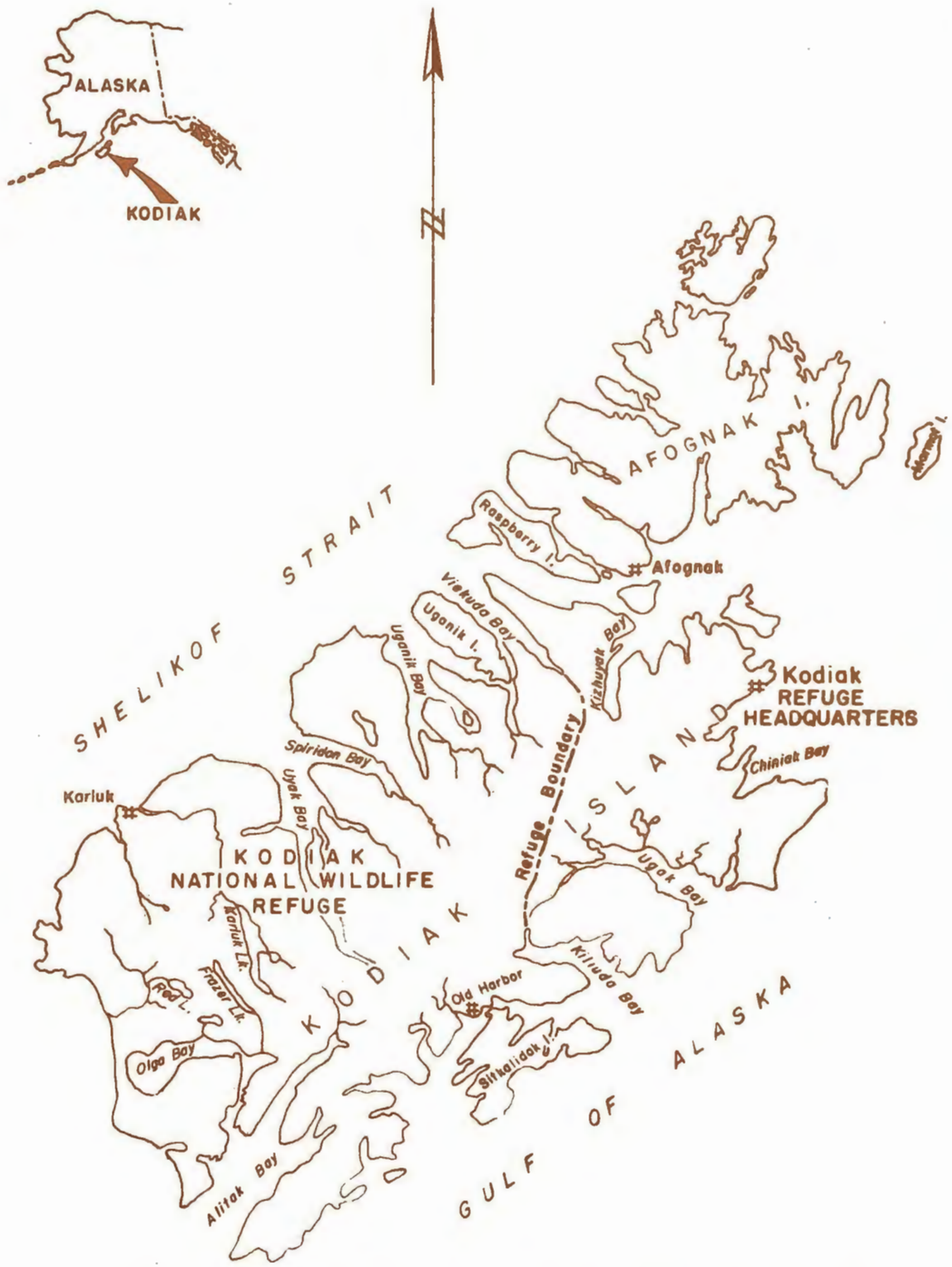
An error appears in the recently submitted Kodiak Narrative Report.

Table 2, 1968, percentage of cubs, stream areas should read 16% instead of 166%.

David L. Spencer

cc: Refuge Manager, Kodiak

DLS:rg



KODIAK NATIONAL WILDLIFE REFUGE

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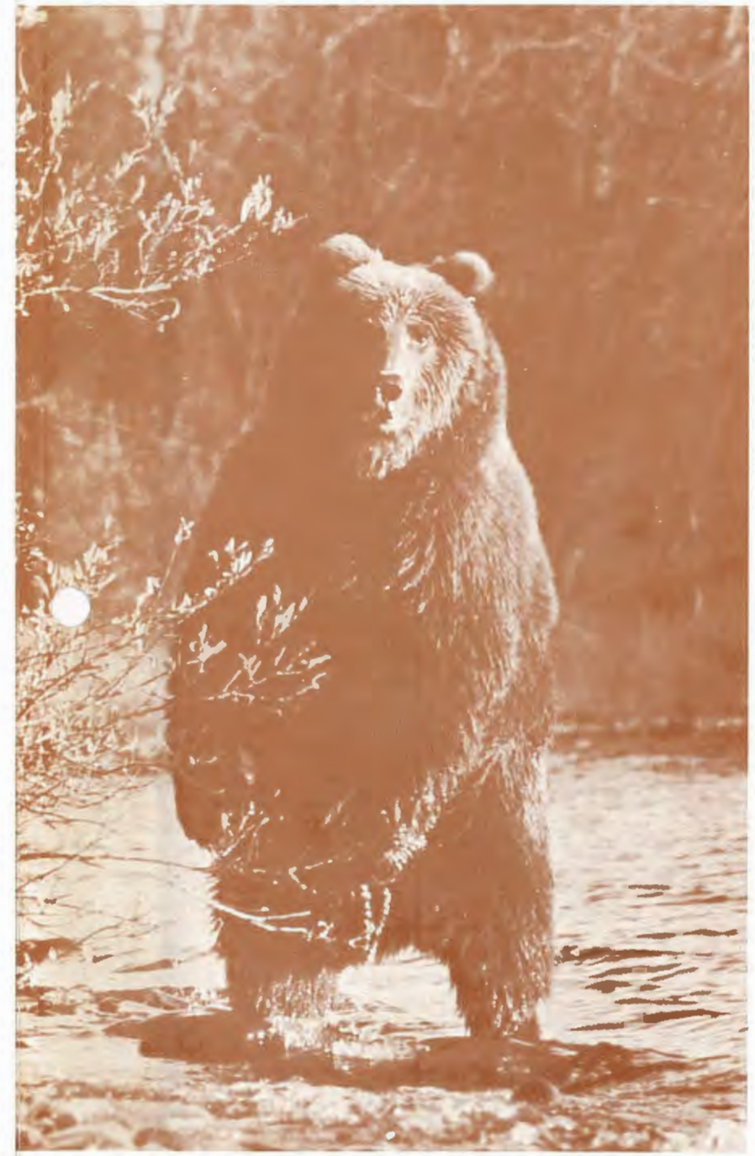
KODIAK NATIONAL WILDLIFE REFUGE



Kodiak Bear

KODIAK NATIONAL WILDLIFE REFUGE was established in 1941 to preserve the natural habitat of the famed Kodiak bear and other wildlife. Unlike many refuges that were established to bring back former habitat destroyed by man, this refuge remains unchanged.

Kodiak Island is the largest island in the Gulf of Alaska and is separated from the Alaska Peninsula by the 30-miles-wide Shelikof Straits. The island is approximately 103 miles long and 57 miles wide, and contains 3,500 square miles. About 2,780 square miles of its southwest portion and the 60 square miles of Uganik Island constitute the Kodiak National Wildlife Refuge.

From its location, Kodiak Island is generally thought to own an inhospitable climate. Actually, the weather is mild. Temperatures rarely fall to zero in winter and may attain 80° in summer. Precipitation averages 60 inches per year, including 45 inches of snow falling mainly in March.

A definite gradual change in the plant life and terrain of Kodiak is seen as one flies over the island, from dense Sitka spruce forest on the mountainous northern part to rolling tundra in the south. At low elevations one sees green meadows, and thickets of alder, elderberry, salmonberry, and willow, and cottonwood trees. Spring and summer wildflowers—lupine, iris, orchids, forget-me-nots, fireweed—splash mountainsides with their colors.

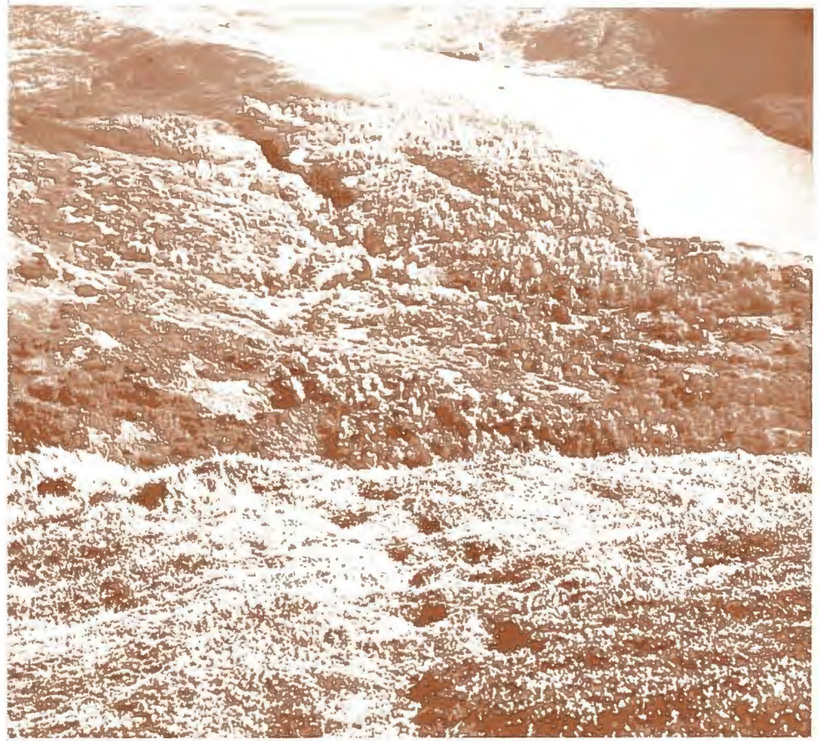
Mammals native to Kodiak National Wildlife Refuge, besides the bear, are red fox, land otter, weasel, tundra vole, and little brown bat. Whales, porpoises, seals, and sea lions frequent the estuaries rich in marine foods. Transplanted to Kodiak, mostly after the 1920's, were blacktail deer, snowshoe hare, beaver, muskrat,

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
Refuge Leaflet 57–R—July 1967

reindeer, mountain goat, mink, red squirrel, and marten. Except for mink and marten, these introductions have been generally successful. Recently Dall sheep and moose have been brought in.

It is of course the bears that especially excite the visitor's curiosity. Biologists estimate 2,400 of these tremendous animals inhabit Kodiak Island. Females may weigh up to 800 pounds, males usually up to 1,200 pounds. Many a story extols the ferocity and danger of this impressive beast—tales generally based on exceptional incidents and gross exaggerations. Experienced outdoorsmen find that bears avoid contact with man, fleeing even when confronted inadvertently. An occasional bear, because of poor eyesight, will advance upon a human intruder, stop, then stand erect, resume the advance, and then hurriedly run away when the man is identified. A novice will invariably misinterpret such behavior as a charge, when in fact the bear is simply trying to determine through nose and ear the nature of the unknown animal he can only dimly discern. Nevertheless, these are large and powerful wild animals. Rare instances of unpredictable behavior require respect and good judgement.

Most bears den from December until April. During the verdant spring and early summer they are vegetarians, as well as later when berries have ripened. They are especially fond of elderberries that ripen in August and September. Bears become easy to observe in July and August, when they congregate along streams to feed on salmon swarming through riffles and over falls on their way upstream to spawn and die. The bears catch spawned and weakened fish by pouncing with forefeet to pin the fish to the stream bed. A comical sight is that of a young bear, wildly running up and down a stream, pouncing here and there with fish skittering in all directions, but too clumsy to make a catch.



A bear trail high above one of the lakes on the Refuge. Hundreds of bears traveling over the same trail caused the deep depressions as each trod in the same footsteps. (Earl Fleming)

Cubs, weighing less than a pound at birth, are born in dens in February and March. A litter is usually three, but may be anywhere from one to five. Young bears remain with their mother for 2 years.

Bear management requires a knowledge of bear life history. Refuge workers have devised means and methods of trapping, anesthetizing, and marking the large animals to determine basic facts like extent of daily and seasonal movements, reproductive rates, maximum longevity, etc. Biotelemetry will enable biologists to monitor daily and seasonal activity, greatly aiding efforts to learn behavioral aspects of this intriguing animal.

Kodiak bears are hunted on Kodiak Refuge under regulations of the Alaska Department of Fish and Game. An annual take of between 150 and 200 animals is permitted. This harvest borders on the maximum that may be killed without threatening the population. A system of continuous surveys helps determine population status and hunting effects. A long-term record of the age and size makeup of the kill gives a base for evaluating quantity and quality of trophies.

Blacktail deer, introduced from southeastern Alaska in 1924, have dispersed throughout the island and are readily observed in winter foraging along the beaches, particularly during low tide periods, when kelp is part of their food.

Eight hundred miles of coastline on Kodiak Refuge, with associated shallows and marshes, make the area important to waterfowl. More than 13 million duck use days, 600,000 goose use days, and about 15,000 swan use days are made of these waters annually (a use day is presence of one waterfowl for one day). Much of the use is during winter. Most common are emperor geese, mallards, scaups, goldeneyes, bufflheads, scoters, oldsquaws, eiders, pintails, and harlequin ducks.

The bald eagle, national emblem of the United States, resides on the refuge in such numbers as to be in almost continual view of an observer. At least 200 pairs nest on shoreline pinnacles, on cliffs, or in cottonwood trees.

The distinctive songs of golden-crowned sparrows and Lapland longspurs are heard on every hand in summer. Other small birds include pine grosbeaks, song, fox, and Savannah sparrows, Wilson's and yellow warblers, violet-green swallows, belted kingfishers, and thrushes. Willow and rock ptarmigans are numerous. The eerie call of the common loon can be heard from almost every lake. Glaucous and mew gulls, as well as sandpipers, phalaropes, plovers, and oyster-catchers are plentiful. Nearly every islet is a gull rookery, and there are several kittiwake colonies of thousands of birds. Extensive nesting colonies of tufted puffins and cormorants may be found on numerous offshore islands.

Besides bear, hunters may take other game species in accordance with State regulations. Fishing, too, is permitted. Rainbow and Dolly Varden trout abound in lakes and streams, while salmon and steelhead may be caught during their upstream migrations. Silver salmon weighing up to 10 pounds are caught with lures, and on parts of the refuge large king salmon, weighing 20 to 60 pounds, also can be taken by the angler.

Because of its strategic location, Kodiak is the center of an expanding commercial fishing industry based on the rich resources of the vast North Pacific. The 20 canneries on the island employ several thousand people to process halibut, clams, herring, shrimp, Dungeness and king crab, and salmon. The salmon fishery contributes the most to the local economy and grosses 10 or more million dollars a year. The refuge plays a vital part in perpetuating this valuable industry by giving continued protection to unique spawning river systems and migration routes.

Young bald eagles at their nest (W. Troyer)

Long before the white man ventured to Kodiak the island was inhabited by aborigines called Koniags. Readily discernible to airline travelers are the earthen outlines of dwellings called barbaras that mark the locations of former villages. These phenomenal people, once numbering at least 6,000, were destined upon the advent of the Russians in 1763 to be the subjects of the same sad saga as the American Indian. Today, only 800 people of Koniag ancestry are left on Kodiak to remind us of a culture forever sealed in antiquity.

Over half of the natives reside in four villages on or adjacent to the refuge. They depend primarily on commercial fishing for a livelihood, while a few act as guides for hunting the Kodiak bear. One may learn by conversation with the older residents of the villages the past history of these interesting settlements. Russian colonization of another day is manifested in the proficient use of the Russian language by older natives, and in the traditional form of worship, for each village has a colorful Russian Orthodox church that also serves as the center of village activities.

Refuge headquarters at Kodiak may be reached by morning and afternoon flights from Anchorage by Pacific Northern Airlines. Several modern hotels are available, but summertime accommodations require reservations. No special permit is necessary to enter the refuge. Several local bush pilots and one local airline facility furnish transportation to almost any part of the area, and commercial fishing boats can be chartered for excursions around the island. There are no roads on the refuge.

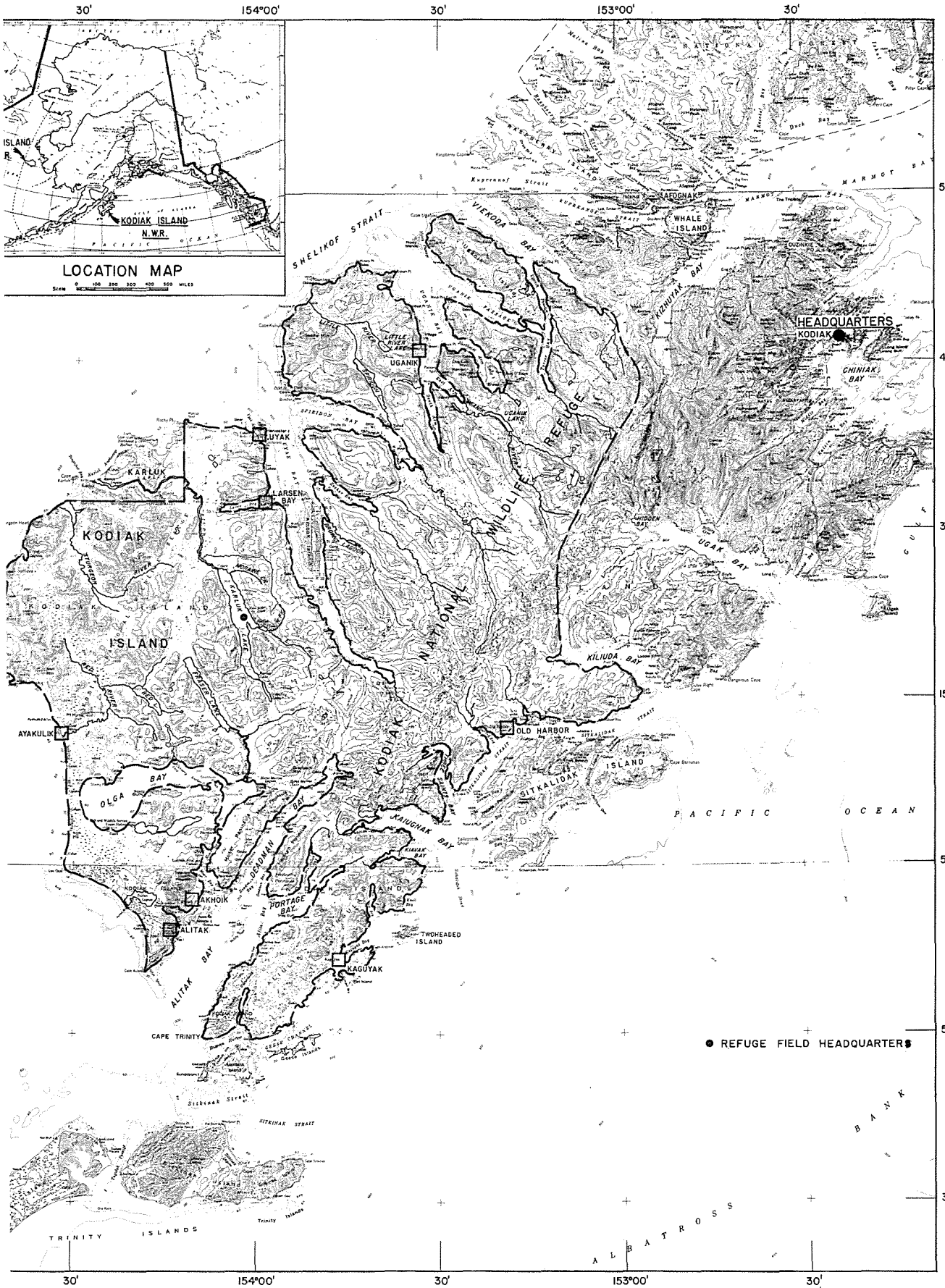
More detailed information concerning Kodiak Refuge may be secured by writing the Refuge Manager, Kodiak National Wildlife Refuge, Box 825, Kodiak, Alaska 99615.

KODIAK ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES
ENT OF THE INTERIOR

ELECTION DISTRICT NO. 13 — KODIAK, ALASKA

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



) IN THE BRANCH OF ENGINEERING
RVEYS BY U.S.G.S., AND NATIONAL
RVICE

), 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	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

TOWNSHIP DIAGRAM

TRUE NORTH
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22°

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KODIAK NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

January 1 to December 31, 1968

Kodiak, Alaska

Refuge Staff

Richard J. Hensel . . . . . Refuge Manager

Vernon D. Berns . . . . . Assistant Refuge Manager

Joseph E. Johnson . . . . . Boat Operator-Maintenanceman (Trans. 2/11/68)

Rex E. Williams . . . . . Boat Operator-Maintenanceman (EOD 5/5/68)

Phyllis A. Fredericksen . . . Clerk-Stenographer

Seasonal Employees

James R. Gilbert . . . . . Wildlife Aide (5/17-8/30/68)

Teryl G. Grubb . . . . . Wildlife Aide (5/17-8/16/68)

Richard L. Blott . . . . . Wildlife Aide (4/24-9/9/68)

U. S. Department of the Interior
Bureau of Sport Fisheries and Wildlife
Fish and Wildlife Service
Kodiak, Alaska

REFUGE NARRATIVE REPORT

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Refuge Narrative Report
January through December 1968
Kodiak National Wildlife Refuge
Kodiak, Alaska

I. GENERAL

A. Weather Conditions. The new year started with temperatures in the high 30's, rain, fog and melting what snow that had accumulated the previous months. By mid month the mercury dropped to the teens followed by more snow. These changes were the general weather pattern until the second week of May when we felt that spring had at last arrived.

Many of the lakes, usually ice-free by early April, remained ice-bound two to three weeks later than usual because of low pressure systems that seemed to hover over the Kodiak Island Group during the month.

The second half of May through June, July, August and most of September brought pleasant weather with occasional low pressure and occluded front cells.

By mid-September, ice was observed on some of the smaller pot holes and heavy frost clung to the shaded vegetation until mid morning indicating that fall was again upon us.

During the first week of October, mountain peaks again became snowcapped. By October 18 the Lilly Lake float pond had frozen marking the end of another year of float aircraft operations at Kodiak.

Fleet Weather Central, located on the Kodiak Naval Station near the city of Kodiak, has furnished the following weather summary which best represents conditions on the refuge:

	Snowfall (inches)	Precipitation (in.) This Month	Precipitation (in.) Normal	Max. Temp.	Min. Temp.	Mean Temp.	Winds (knots) Ave.	Winds (knots) Max. Gusts
Dec. (67)	13.3	4.84	4.97	54°	0°	29.0	11	76 NW
Jan.	10.0	1.97	3.69	48°	-5°	28.0	12	51 NW
Feb.	22.6	9.61	4.02	41°	-2°	31.0	9	38 NW
Mar.	3.0	3.35	3.12	49°	18°	34.0	12	42 SE
Apr.	6.0	4.50	4.41	49°	14°	36.0	10	46 SE
May	4.0	1.97	3.81	54°	41°	47.0	7	39 NW
June	0.0	2.07	3.54	56°	42°	49.9	8	37 NE
July	0.0	7.60	4.35	65°	44°	54.5	7	29 NE
Aug.	0.0	3.68	5.92	63°	49°	56.5	10	31 E
Sept.	Trace	5.85	5.55	64°	26°	48.6	10	44 E
Oct.	0.3	4.04	5.58	45°	31°	38.4	9	54 NW
Nov.	Trace	7.34	4.93	48°	17°	36.0	18	63 E

B. Habitat Conditions

1. Water. Normal to low water conditions prevailed throughout the spring and summer. The mild winter was not conducive to large accumulations of snow at higher elevations. In late September and early October precipitation brought the streams and lakes back to normal. Lakes and ponds were free of ice by the latter part of May and commenced to freeze in mid-October.

2. Food and Cover. Wild hellebore and angelica made their usual appearance by late April followed shortly by wild celery shoots despite unfavorable temperatures. It was in timing with the emergence of bears from dens as these plants are some of the key food items at this period. Red salmon runs were good to excellent, starting in June and peaked the last half of July in the spawning streams followed by the pink salmon runs in August. Both red and pink salmon provide the bulk of the bear's diet during the summer. The late run of red and silver salmon, extending into October, offered additional bear food items. The berry crop produced an excellent yield this year. Green elderberries first appeared in bear droppings on July 17, and thereafter, bears left the salmon streams to forage in the berry patches. Other berry crops, such as salmonberry, highbush cranberry, lowbush cranberry and crowberry were also rated good to excellent.

   Food conditions for Sitka black-tailed deer and reindeer were very good. Both species were unhindered because of shallow snow depths which allowed them accessibility to winter ranges in the lowlands and exposed mountain slopes. Forage for snowshoe hare showed little to no change and excellent berry crops were more than adequate

for ptarmigan. Foxes, weasels and raptors should have good food conditions from the numerous runs and tundra voles observed this summer.

Eelgrass was not as evident on the beaches as in past years. Perhaps this was because we were not on the beaches after some of the violent storms which tend to windrow it at the high tide levels.

II. WILDLIFE

A. Migratory Birds. Wintering waterfowl consisting of scoters, old squaw, Pacific eider, greater scaup and goldeneye remained in the protected bays and inlets throughout the winter. The large concentrations (1,000-2,000) of old squaw and scaup that normally winter near the canneries and feed on King crab gurry discharged into the bay and channel were noticeably absent this year due to the change of cannery processing. The canneries have converted from a canned commodity to frozen-in-the-shell product, thus eliminating waste discharges that attracted diver ducks. By mid-April these birds migrate northward and to "the Chain" except for some goldeneye that nest at the larger lakes on the Island. There are 2,500 ± mallards that take up winter residency on Kodiak, most of them in Uyak, Zachar, and Terror Bays staying near the tidal flats and eelgrass beds. On April 10, the first migrant pintails were observed feeding at Bells Flats.

No brant were observed by refuge personnel although reports filtered to our office that remnant flocks passed near Chiniak in April. A few emperor geese were seen along beaches during the winter and a larger concentration of them reportedly wintered in the Trinity Islands south of Kodiak.

The Refuge Manager from the Aleutian Islands NWR called on November 2 stating the geese had begun their migration from Izembek Bay. Weather was not conducive for aerial surveying but small flocks were sighted along the road system on November 4 and 5 indicating at least some of the birds migrated over Kodiak.

Whistling swans were first sighted on April 10 when a flock of 35 was seen at Bells Flats. Five broods were tallied during the summer of 7, 5, 5, 3, and 1 cygnets. One pair nested on a small lake that had been dammed by beaver the year previously in the Dog Salmon drainage. There were an estimated 12 nesting pairs using the refuge this year. Waterfowl brood counts are summarized in Table 1.

Table 1. Summary of brood size information gathered incidentally at Karluk Lake and elsewhere on the Kodiak Refuge during the 1968 field season.

Species	No. Observed with Broods	Total No. of Young	Ave. Brood Size	Range Brood Size
Common Merganser	12	138	11.5	1-25
Barrow's Goldeneye	9	44	4.9	2-8
Greater Scaup	1	2	-	-
Harlequin	3	21	7.0	3-12
Mallard	2	10	5.0	4-6
Pintail	1	10	-	-
Teal	3	17	5.7	1-10
Whistling Swan	5	21	4.2	1-7

Because of the birds moving in late in the fall, duck hunters have requested the season be opened to coincide with the season in the Aleutian and Pribilof Islands which opens October 14 to January 26 rather than the September 1 to December 14 dates.

B. Upland Game Birds. Rock and willow ptarmigan appeared to be abundant wherever habitat was available. Rock ptarmigan in coveys of 50 to 100 were frequently seen during aerial patrols flown in October. Hunting pressure was negligible because the birds are inaccessible to the average hunter.

C. Big Game Animals

1. Reindeer. The status of the feral reindeer since 1964 remains status quo, that is, the Alaska Department of Fish and Game continue to negotiate the purchase of them from the Alitak Reindeer Association. The grazing lease expired in 1964 which is administered by the Bureau of Land Management. The lease has never been renewed and the animals continue grazing in trespass within the refuge. Small bands of reindeer were sighted incidental to other surveys in the flats of Red, Sturgeon, Fraser and Karluk Rivers during the spring and summer.

2. Mountain Goat. Goat hunting was permitted for the first time since they were introduced to Kodiak in 1952. Hunting was by State permit only, of which 10 permits were issued from the 33 applicants. Nine of the permittees hunted and took 3 males, 3 females and crippled one animal. Four of the animals were taken in the refuge. Their ages ranged from a two-year-old, which incidentally scored 44-2/8 by Boone and Crockett measurement, to one animal that had teeth worn to the gum lines. The largest male scored 47-6/8.

   ADF&G personnel made an aerial goat survey on December 20 and tallied 57 adults and 14 kids. This is the most animals seen in any one survey.

3. Moose. Six moose calves were released near Barabara Cove Lake, Kupreanof Peninsula, last year by the Alaska Department of Fish and Game. One bull was located adjacent to Village Islands and tracks of another animal was reported along the river in Spiridon Bay. Our thoughts were documented in the 1966 NR opposing the introduction, knowing in due time the moose would disperse onto the refuge. Our reasoning is that the browse is too limited to meet the eventual winter range requirements for moose and that it is in direct competition with the deer.

4. Sitka Black-tailed Deer. The mild winter and lack of snow cover allowed deer to move to adequate winter browse causing little or no winter mortality. The hunting mortality was estimated as 1,300 animals on State and refuge lands with approximately 220 deer taken from Uganik Island.

   Heavy snow cover in early December forced deer to the lower elevations and along the beaches by midmonth. On December 24, 93 deer were counted in 1.9 hours of flying. Most of the deer were in groups of 2, 3 and 4's; however, one group of 26 animals was yarded near Miner's Point.

5. Dall Sheep. The Alaska Department of Fish and Game did not attempt a sheep transplant as in 1965, 1966 and 1967. Of the known 31 captured on the mainland for the project during this period, only 4 of them survived long enough to reach the alpine on Kodiak. No sightings were made of these animals in 1968.

6. Kodiak Brown Bear

   a. Population Surveys. Composition counts were conducted in selected alpine areas and along salmon streams as in past years (Table 2). These were supplemented by ground counts July 11 through July 15 made from an observation post overlooking the O'Malley/Canyon Creek tributary of the Karluk Lake drainage. Forty-three individual bears were recognized and classified with daily totals ranging from 20 to 31 animals. Thirty percent were classified as adults, 21 percent subadults, 28 percent yearlings and 21 percent were cubs of the year. The peak activity periods were early morning, late evening, and from 1500 to 1800. Of interest in the alpine was the proximity of animal counts. Four surveys were conducted in two areas between July 7-20 with 53 and 54 animals seen in the Uganik area and 40 and 37 in the Uyak area.

      There is a greater variation in the stream surveys due to several factors: the arrival of salmon, abundance of spawning salmon, brush-covered habitat along some of the selected streams and amount of human disturbance.

   b. Hunting Data. Changes in State and Federal regulations markedly important to bear management were put into effect this year. The bear season on the refuge was closed on May 20. This reduced the kill

Table 2. Composition of bear populations as reflected by aerial surveys made along certain stream and alpine areas of the Kodiak National Wildlife Refuge from 1963 through 1968.

	1963		1964		1965		1966		1967		1968	
	Str.	Alp.	Str.	Alp.	Str.	Alp.	Str.	Alp.	Str.	Alp.	Str.	Alp.
No. of Surveys	-	-	-	-	8	-	8	5	6	4	7	4
Average/Survey	-	-	-	-	63	-	34.2	19.8	14.5	28.5	35	46
Total Count	748	476	341	191	514	-	275	99	87	114	245	184
Cubs	60	96	33	30	31	-	16	3	15	43	38	50
Percent of Total	8	20	9	16	6	-	5	3	17	37	16	27
Sow with cubs	28	42	13	16	7	-	10	2	6	19	17	21
Mean litter size	2.20	2.30	2.53	1.87	2.07	-	1.60	1.5	2.50	2.26	2.24	2.40
Yearlings	217	84	96	45	148	-	68	16	6	3	54	38
Percent of Total	29	18	28	24	28	-	25	16	6	2	22	21
Sows w/yearlings	92	41	40	25	71	-	34	10	3	1	24	17
Mean litter size	2.40	2.10	2.15	1.80	2.18	-	2.00	1.6	2.00	-	2.25	2.23
Total bears over 3 years in age	471	296	212	116	108	-	61	50	33	51	153	55
Percent of Total	63	62	62	60	21	-	22	49	37	44	62.4	51
Sows w/young	120	83	53	41	78	-	44	12	9	20	41	38
Percent of Productive Females	16	17	22	21	14	-	16	12	10	17	17	20

error 16 %

by about 16 percent as 64 percent of the total harvest in the past was accountable to hunting in May. A federal hunting permit was required for the spring and fall season this year. Although made mainly to relieve hunter conjestion in certain areas, it discouraged a few hunters as they could not hunt the area they had selected and therefore hunted off the refuge, but it did increase success for hunters partaking in the spring hunt in that hunters were dispersed throughout the refuge. At the time of this writing we do not have enough comparative data to define the increased percent of success. The permit system had other merits in obtaining information on hunter's success (Table 3), days used, and type of hunting.

During the spring bear hunting season 34 males, 26 females and 1 bear of unknown sex were taken from the refuge. Also taken were 11 males and 7 females off the refuge. The average squared hide sizes for guided hunts are shown in Table 4.

Tables 5 and 6 summarizes the brown bear mortalities within the Kodiak Island Group. It will be noticed the harvest was greatly reduced this year, both within and out of the refuge. Within the refuge 124 bears were taken by trophy hunters in 1967, during the spring hunt, as compared to 61 animals for the spring of 1968, a decrease of 51 percent. Those taken outside refuge boundaries totaled 29 in 1967, and 18 in 1968, or a 38 percent reduction. The two major reasons for the lower harvest is because of weather causing bears to emerge from dens later, and the 11-day earlier closure of the season within the refuge.

During the 1968 fall hunting season, 29 bears were harvested in the Kodiak Island Group with 25 being taken from the refuge and 4 in other areas. There were 25 animals taken within refuge boundaries and 22 outside for a total of 47 in 1967.

D. Fur Animals, Predators, Rodents and Other Mammals

1. Beaver. Beaver trapping as well as any other trapping appears to be more popular as outdoor recreation than a means of income. Most of the trapping takes place along the road system. Last year there were 215 beaver sealed for the Kodiak Island Group with approximately 50 taken within the refuge. Several beaver ponds, vacant last year, were active this year with

Table 3. Permits for brown bear hunting on Kodiak National Wildlife Refuge, 1968.

	Spring			Fall		
	Resident	Nonres.	Total	Resident	Nonres.	Total
*Permits used	93	67	160	17	45	62
Bears taken						
Male	12	22	34	0	14	14
Female	9	17	26	1	10	11
Unknown	1	0	1	0	0	0
Percent permittee success	24	58	-	0	56	-

*Two permittees killed bear off refuge

Table 4. Average size of squared bear hides taken during spring and fall seasons by hunters using guides, 1957-1968.

	Spring				Fall			
Year	Number Represented	Average Size	Percent 9' Plus	Percent 10' Plus	Number Represented	Average Size	Percent 9' Plus	Percent 10' Plus
1957	55	8' 8"	42	27	27	9' 1"	30	7
1958	42	9' 6"	60	29	27	9'	60	15
1959	65	8'11"	47	26	39	8'10"	43	5
1960	38	9' 1"	63	13	16	8'10"	43	18
1961	57	8' 1"	15	12	26	8' 6"	23	15
1962	50	8' 8"	40	10	26	8'	7	0
1963	40	8' 4"	42	15	22	8' 5"	32	5
1964	37	7' 6"	11	0	19	8' 3"	22	11
1965	52	7' 7"	21	1	27	8' 4"	18	3
1966	43	7'10"	23	4	47	7'11"	17	4
1967	58	7' 7"	10	0	31	7' 9"	9	3
1968	40	7' 7"	10	1	24	7' 9"	17	0

Table 5. Summary of brown bear mortalities occurring within the Kodiak Island Group during Spring (S) and Fall (F) seasons of 1968.

Mortality Mode	Kodiak National Refuge							Excluding Kodiak National Refuge						
	Male		Female		Sex Unknown		Sub Total	Male		Female		Sex Unknown		Sub Total
	S	F	S	F	S	F		S	F	S	F	S	F	
Sport Hunting Nonguided	12	0	9	1	1	0	23	10	1	7	3	0	0	21
Guided	22	14	17	10	0	0	63	1	0	0	0	0	0	1
Scientific Purposes	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Regulation Violations	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Life & Property Defense	0	0	0	0	1	0	1	2	3	0	0	0	1	6
Food	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Mortalities	34	15	26	11	2	0	88	13	4	7	3	0	1	28

Table 6. Summary of brown bear mortalities occurring within the Kodiak Island Group from 1953 through 1968.

	Refuge							Off Refuge						
	NG	G	DLP	SP	F	EUM	Totals	NG	G	DLP	SP	F	EUM	Totals
1953	45	101	2	2	-	32	182	10	0	11	0	0	9	30
1954	29	84	2	9	6	34	164	8	1	-	0	0	10	19
1955	19	63	3	1	9	28	123	16	1	6	0	0	8	31
1956	23	93	0	0	13	17	146	16	1	8	0	0	7	31
1957	14	79	0	0	6	13	112	8	1	3	0	0	4	16
1958	14	72	1	1	13	20	121	9	2	17	0	0	4	32
1959	24	106	0	0	14	10	154	10	2	13	0	0	6	31
1960	34	58	0	2	13	14	121	12	0	15	0	0	7	34
1961	18	69	0	2	3	10	102	19	0	6	0	0	8	33
1962	20	77	1	0	12	-	120	22	2	8	0	0	8	40
1963	19	63	4	1	4	11	102	33	3	50	0	0	9	95
1964	33	56	2	0	0	8	99	21	4	9	0	0	8	48
1965	47	76	1	0	2	4	130	67	8	2	0	0	8	85
1966	76	80	6	3	1	12	178	27	8	7	0	0	8	50
1967	59	84	0	5	1	7	156	36	12	10	0	0	8	66
1968	23	63	1	0	1	8	96	21	1	5	0	0	8	35

NG - Nonguided hunts
G - Guided hunts
DLP - Defense of life or property
SP - Scientific purposes
F - Food
EUM - Estimated unknown mortality

well supplied food caches. As indicated under "Waterfowl", they are a welcome fauna to the refuge as they have a tendency to improve the habitat.

2. Land Otter. Otter signs were abundant in drainages that we travelled this year. One evening at Karluk Lake we watched a family group of six swimming and playing. They would often give a high-pitched squeek or sound that resembles the voice of a robin.

3. Fox. Fox were numerous this year. Sightings were almost daily where they were feeding along the salt water beaches at low tides. We obtained three pelts from a trapper for illustrated lectures to show the color variation of the red, cross, and silver fox.

4. Weasel. Weasels are abundant again this year. One moved into the field headquarters at Karluk Lake and was making a nuisance of himself scattering food scraps from the garbage can and food items left on the counter in the kitchen.

5. Snowshoe Hares. The population appears to be down as indicated by observations and hunters' success around the Navy Reservation in 1966 and 1967. Hunting snowshoes with beagles is a very popular sport along the road system.

6. Meadow Mice. Numerous burrows and runs as well as the rodents themselves were observed in the meadows and marsh areas which indicate the population is moderate to high.

E. Hawks, Eagles, Crows, Ravens and Magpies

1. Hawks. A pair of goshawks apparently renested near Camp Island this year. Many observations were made of one of the pair carrying mice and other unidentified objects in it's feet past the field headquarters in the same direction.

2. Eagles. Aerial surveys were flown the last week of May using the Refuge Supercub N724. Rather than flying all of the refuge's coastline, major streams and lakes, three sample areas were covered for statistical methods to estimate the total number of active nests. Two additional areas were surveyed to double-check on certain variables that might occur in the mathematical formula.

It was calculated that there were 153 active nests this

year compared to 166 in the 1967 survey (Table 7). Revisiting the sampling areas in July for banding purposes and food studies revealed an average of 1.7 eaglets per active nest (Table 8). If the unsuccessful nests are included in this figure the average production drops to 0.82 eaglets per nest active in May. Detailed information has been kept at Karluk Lake since 1952 and is presented in Table 9.

Of 35 nests examined during banding and observational activities, 19 contained food items. Salmon occurred in 32 percent of the nests, with red salmon being most common and pink salmon found only once. Both gull and Dolly Varden trout remains were found in 16 percent of the nests. Crow and magpie remains were third in frequency. The remaining food items -- tufted puffin, pelagic cormorant, pigeon guillemot, fox, and greenling (a marine fish), were only found once.

Banding of nestlings was done intermittently from July 10-31. A total of 42 eaglets in 24 nests were banded with a size No. 9 aluminum (509 series) or stainless steel (569 series) band placed on the left tarsus. Sixteen eaglets were banded in the Karluk-Fraser Lake areas and 26 along the coast. This brings the total to 179 eagles being banded at the Kodiak Refuge.

This season, coastal banding was done using the refuge aircraft rather than the refuge M/V KODIAK BEAR II. The aircraft proved to be much more efficient for this type of work because (1) there was greater ease in locating nests and ascertaining whether it was an active or inactive nest, (2) less travel time between nests, (3) less manpower involved, and (4) less total time required for the whole operation.

A golden eagle, a rare visitor to Kodiak, was collected alive on March 5 near the road system by military personnel who found the bird incapable of flight. The bird appeared to be a victim of starvation and was fed several days at the refuge headquarters before being banded and released.

3. Crows, Ravens and Magpies. All three of these species are abundant year around residents and no significant change has been recognized.

F. Other Birds. Nothing to report.

G. Marine Mammals. Because of the low price and demand of seal skins, coupled with the fact that the State has stopped paying a bounty on scalps, very little hunting effort is being made. It is estimated that less than 1,200 were taken this year as compared to 8,000 scalps being presented for bounty payments in 1966.

Table 7. Location and number of bald eagle nests on the Kodiak Refuge, 1963-1968.

	Occupied Nests						Unoccupied Nests					
	1963	1964	1965	1966	1967	1968	1963	1964	1965	1966	1967	1968
Uganik & Terror Bays	27	17	21	20	27	25	31	24	21	17	20	18
Spiridon & Zachar Bays	21	12	15	14	22	12	36	17	21	17	12	23
Uyak Bay	23	10	18	19	17	12	38	10	25	20	13	30
Outer Shore of Uyak to Olga Bay	12	13	12	19	20	-	3	8	3	6	7	-
Karluk Lake and River	12	9	11	11	18	11	26	6	7	6	8	16
Kiliuda to Kaiugnak Bay	14	5	12	9	13	-	8	7	14	9	7	-
Kaiugnak to Sulua Bay	28	11	14	13	33	29	3	12	6	3	5	2
Dog Salmon River & Deadman Bay	13	6	12	10	11	-	11	12	4	3	11	-
Nondesignated Areas	2	1	7	8	5	-	0	1	2	2	1	-
Total	151	84	122	113	166	89*	156	97	102	83	84	89*

* Actual nests counted only in sampling units -- estimated 153 occupied nests and 89 unoccupied during 1968.

Table 8. Productivity of bald eagles at the Kodiak Refuge from 1963 thru 1968.

Year	No. Nests Revisited	No. Occupied Nests	No. Abandoned Nests	Active Nests (%)	No. Nests Containing 1 yg	2 yg	3 yg	Young/Nest (Ave.)
1963	76	49	27	63	20	26	3	1.6
1964	45	22	23	50	8	13	1	1.7
1965	35	19	16	54	-	-	-	1.4
1966	39	24	15	62	10	14	0	1.6
1967	54	37	17	68	11	26	0	1.7
1968	35	24	11	67	8	14	2	1.7

Table 9. A summary of bald eagle nesting activity at Karluk Lake, Kodiak Refuge from 1952 through 1968.

Year	Pairs with territory	Pairs occupying nests (active)	Pairs with unoccupied nests (inactive)	No. young fledged	No. nests with young fledged	Percent success*	No. birds per occupied nest
1952	18	-	-	-	-	-	-
1956	-	10	-	-	-	-	-
1958	-	10	-	14	-	-	-
1959	-	-	-	14	10	-	-
1960	-	-	-	12	6	-	-
1961	14	8	6	5	4	50	0.62
1962	16	14	2	13	8	57	0.92
1963	15	9	6	9	5	56	1.00
1964	14	8	6	11	6	75	1.20
1965	11	-	-	13	6	-	-
1966	13	9	4	13	7	77	0.69
1967	15	13	2	23	13	87	1.77
1968	14	12	2	14	8	75	1.75

* Success as used here is a ratio of the number of nests with young fledged to the number of active nests.

H. Fish

1. Sport Fishing. Sport fishing on the Karluk River is unique and as changeable as the seasons of the year. Throughout the late fall, winter and spring steelhead fishing is the main attraction followed by king salmon from late June into August. Silver salmon begin showing in the river by the last of August and peak in October. Dolly Varden and Char are present throughout the year. It sounds like a fisherman's dream and indeed it is as it has attracted many people from Europe as well as the "Lower 48". Their comments left in the recreation cabin's log and letters state that "fishing on the Karluk is the best in my life" to "the highlight of our trip to Alaska".

2. Commercial Fishing. Dick Marriott, fish biologist of ADF&G, made an aerial survey on August 2 of the Karluk River. Mr. Marriott counted a total of 700 king salmon; 35 of these were above the fish weir near the mouth of the lake, whereas a total of 66 kings were reported through the weir by October 6. Other fish counts through the weir were 344,940 red, 21,240 pink, 2,356 silver and 614 steelhead.

   The commercial salmon catch in Table 10 shows that this was about an average catch in the Kodiak area on the even numbered years. The ADF&G strive to have a 20-25% escapement on these good years. This at least gives us an index as to the food available in the streams which is so vitally important to bears.

I. Diseases. Nothing to report.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development. With careful planning, we had sufficient funds to build a 4 by 6-foot prefabricated generator house at Karluk Lake field station.

B. Maintenance. A major overhaul was required on the diesel engine of the M/V KODIAK BEAR II and considerable time was spent refiberglassing the pilot house where it joins the hull.

A partition was removed in the main cabin at the Karluk field station to allow more space in the kitchen-dining area. It also required installing a larger oil heater.

Regular cleanup of the residence and workshop area was made as needed during the year. Other maintenance included the

Table 10. Commercial salmon catch in the Kodiak District from 1959 thru 1968 as compiled by the Alaska Department of Fish and Game.

Year	King	Red	Silver	Pink	Chum	Total
1959	1,837	330,087	14,512	1,967,058	733,784	3,047,278
1960	1,191	362,194	54,213	6,684,798	1,133,412	8,235,808
1961	864	407,979	28,579	3,926,023	518,935	4,882,380
1962	1,095	784,664	53,831	14,115,832	794,717	15,750,139
1963	286	407,040	57,011	5,480,158	305,061	6,249,556
1964	1,302	477,938	35,567	11,861,785	932,219	13,308,811
1965	705	283,403	11,433	2,832,723	412,319	3,540,583
1966	566	608,137	64,127	10,591,649	753,815	12,018,294
1967	1,735	308,404	10,354	187,343	226,217	734,071
1968	1,936	760,348	56,013	8,760,533	749,854	10,328,684

usual minor repairs of vehicles, outboards and boats, and safety inspections of heating units and fire extinguishers.

C. Collections and Receipts

One bear that inadvertently died during the tagging operations this fall was skinned and the hide sent to be tanned. The pelt will be used for demonstration purposes at wildlife lectures.

Teeth were collected from 80 bears taken by hunters or extracted from unknown age animals captured in field studies. The teeth were sectioned and are being examined for aging each animal.

D. Fires

No fires occurred on the refuge during the year.

IV. RESOURCE MANAGEMENT

A. Special Use Permits

1. Trapping. Seven permits were issued to trappers. As discussed under "Wildlife", trapping is mainly for recreation. One permittee took 18 beaver, another caught 10 land otter, 4 foxes and 2 weasels, another took 4 otter and 18 foxes, and one permittee reported 1 fox--and he shot it.

2. Cabin Permits. This year there were 48 permits in effect for cabins, tent frames and cannery sites. Fourteen of these permits were issued to professional guides for hunting camps whereas the majority were for gillnet sites.

3. Grazing Lease. The only active grazing lease on the refuge is administered by the Bureau of Land Management. The leasee has about 50 head of sheep and goats.

V. FIELD INVESTIGATIONS

A. Kodiak Brown Bear. Investigations involved trapping and capturing free-roaming bears with the use of dart guns for the purpose of tagging and radio instrumenting. A summary of the trapping results are presented below:

No. of Operating Days	No. of Trap Days	No. of Traps Sprung	No. of Captured	No. of Bears Captured
32	341	96	28*	24

* Nos. captured included 1 otter, 1 eagle, 2 foxes

Nine free-roaming bears were captured incidental to the trapping operation by use of the dart gun. Five of the 33 bears were recaptures from previous field seasons.

Collar type radio transmitters were attached to three adult females. A brief resume of each bear is included.

Sow No. 53-8 with 3 cubs of the year was instrumented on July 14 at Cottonwood Creek. This animal stayed within one square mile of the creek from capture date to August 2 when radio contact was lost.

The second female with two yearlings was a recapture from 1966, No. 33-6. She was monitored from July 16 to September 5 within a two-square-mile area of a salmon stream and adjoining mountain slopes.

Bear No. 57-8 was monitored 30 times and sighted twice between July 16 and October 18. This female moved to another drainage 13 miles in distance to the southeast and returned to place of capture within two days. When last monitored she had traveled approximately 8 miles northwest into the Fraser Lake drainage. Bad weather prevented search for several days and when it was resumed the bear could not be found. Either the transmitter stopped pulsating or she had moved out of the search areas.

B. Bald Eagles. In coordination with nesting, banding and food habits studies of bald eagles, Wildlife Aide Grubb spent 84 hours recording adult behavior and activity around active nests. Information gathered included soaring flight, attack patterns, stretch and preening activity, vocalizations, addition of nest material, growth and development of young, perches, disturbance reactions, and individual and pair differences. Only the last four topics have value toward management, whereas the other categories represent behavioral research.

VI. PUBLIC RELATIONS

A. Recreation Uses. Bear hunting, sport fishing, deer hunting, small game hunting and trapping, in that order, are the primary forms of recreation. These have been discussed under "Wildlife". Also worthy of mention is photography and berry picking, although the latter takes place mainly near the outlying villages.

B. Refuge Visitors

Date	Name	Address	Representing
1-2	Rex Williams	Kenai, Alaska	BSFW - Business
2-9	Joyce Metzker	Kodiak	K.I. Borough - Bus.
2-13	Robert Lamb	U.S. Naval Station Kodiak	USN - Business
2-13	Steve Dietemeyer	NavCommSta Kodiak	USN - Visit
4-1	Rev. Molletti	Kodiak	Baptist Mission
4-1	Rev. Stone	Kodiak	Baptist Mission
5-21	John Klingbiel	Anchorage	BCF - Visit
6-27	John D. Findlay	Portland	BSFW Regional Office Inspection
6-27	A.V. Tunison	Washington, D.C.	BSFW Central Office
6-27	Theron Smith	Anchorage	BSFW - Aircraft Div.
6-27	David Spencer	Kenai, Alaska	BSFW - Insp.
7-12	Jack Lentfer	Anchorage	ADF&G - Bear studies
7-22	Floyd Short	Sand Point, Alaska	ADF&G - Enforcement
7-22	Ed Wightman	Kodiak	ADF&G - Enforcement
7-25	F.T. Blunck	U.S. Naval Station Kodiak	USN - Fire Dept.
7-31	James Heckman	Portland	BSFW - Fishery
9-16	A.A. Nault	Kodiak	Trapper - Visit
9-27	Jim Shaw	Portland	BSFW - Realty
9-27	Joe Want	Fairbanks	Guide - Visit
10-8	Ray Tremblay	Anchorage	BSFW - Enforcement
10-8	D. Combs	Anchorage	BSFW - Enforcement
10-31	Kodiak Vocational Students	Kodiak	Class tour
11-8	Bern Keating	Greenville, Miss.	Nat'l. Geographic Society
11-21	Kris Helgason	Terror Bay, Alaska	Guide - visit

Local military and civilian visitors requesting information on hunting, fishing, cabin reservations and the refuge in general are not listed.

C. Refuge Participation

Jan. 8-11 - Refuge Managers Berns and Hensel attended the Alaska Department of Fish and Game, Game Division Meeting, in Anchorage and submitted two regulation proposals.

Jan. 23 - Sea Otters of Amchitka was shown to the Navy Officers' Wives Club at the Naval Station.

Jan. 25 - Sea Otters of Amchitka was viewed aboard the Coast Guard Cutter STORIS by its crew and officers.

Jan. 15	- Refuge Managers Hensel and Berns assisted personnel of the Kodiak Naval Station in preparing a cooperative plan for fish and wildlife resources within military lands.
March 5	- Hensel appeared on television (AFRTS) and explained the permit regulation pertaining to brown bear on the refuge.
March 8	- Hensel attended the State Fish and Game Advisory Board to answer any questions concerning the federal permit regulations.
March 12	- Hensel met with the Commandant at the Kodiak Naval Station to assist in the planning for National Wildlife Week and reactivation of the Navy Conservation Club.
March 19	- Hensel presented the movie The Pond to 200 grade school children in keeping with the theme for National Wildlife Week.
March 21	- Hensel showed the film Wildlife Refuge to members of the Navy Conservation Club.
March 25	- Refuge Manager Hensel gave a three-hour lecture on brown bear hunting and caring for trophies to interested personnel at the Navy Conservation Club.
March 28	- The films Wildlife Heritage and The Pond were shown at the Kodiak High and grade schools.
April 2	- Sea Otters of Amchitka was shown to 37 members and guests of the Navy Conservation Club.
April 4	- Berns instructed City Policemen and the Dog Catcher in the use of immobilizing drugs and Cap-Chur Gun equipment on stray dogs at the City Police Dept.
April 11	- Hensel presented a slide lecture dealing with flowers and wildlife of Kodiak Island to 53 ladies at the Navy Officers' Wives Club.
May 8	- Berns gave a second session on use of drugs and Cap-Chur Gun equipment at the Kodiak Police Dept.
Aug. 2-10	- Refuge Manager Hensel assisted personnel at the Aleutian Islands National Wildlife Refuge setting up brown bear surveys on Unimak Island.

Aug. 26-30 - Berns and Hensel attended a bear research workshop and 19th Alaska Science Conference at Whitehorse, Canada. Berns presented a paper concerning radio tracking techniques at the conference.

Sept. 10 - A slide lecture on brown bear ecology was presented to 42 Kodiak Rotarians by Hensel.

Nov. 12-19 - Hensel and Williams visited outlying villages of Port Lions and Larsen Bay via M/V KODIAK BEAR II and showed the films Way of Life, Magic Land and Know Your Waterfowl to approximately 450 people.

Nov. 30 to Dec. 6 - Berns and Hensel attended the ADF&G Game Board Meetings in Anchorage and presented data and proposals for bear hunting on the Refuge.

D. Hunting. Hunting is discussed under "Wildlife" as it applies to each important game species. Copies of the hunting regulations are contained in the envelope attached to the rear cover of this report. All refuge lands are open to hunting in accordance to Alaska Game and Guiding Regulations except for brown bear hunting. Because of the status of the brown bear population and hunting pressure the refuge imposed special regulations to include bear hunting by permit only and closure of the Karluk drainage. The permit system was warranted to (1) relieve hunter conjestion, (2) keep track of hunters' camps, (3) obtain information on hunter days use, resident and nonresident hunters, and hunting success.

E. Violations. Warning citations were issued to two temporary Bureau of Commercial Fisheries employees for taking foxes during a closed season. In the past there has been no closed season in Unit 8. This year, however, the regulation was changed and became effective July 1. These people did not take time to read this regulation with their only excuse being "we thought it was open". Two warning tickets were issued to residents in the native village of Larsen Bay. Bears maundering around gillnet sets were shot in defense of life and property and not reported to the game officials. This is a common occurrence but in this case we were informed and upon investigation found the bear. We feel that some of the violations in the outlying villages are our fault. If and when we can get some I & E to these people on how important the game is and how it can help their economy, we will be able to curb some of the violations. One case of a bear being taken out of season and another case of taking a bear without a Federal permit is still under investigation.

F. Safety. Our last lost time accident at work occurred in November 1965 when a temporary Wildlife Aide's finger became infected from a scratch while cleaning bear skulls. It later infected the bone and he became hospitalized for several days.

Assistant Refuge Manager Berns lost the end of his ring finger while working in an unofficial capacity and had to have it amputated at the terminal joint which required two days of sick leave.

Furnaces and hot water tanks were periodically cleaned and inspected for any defects.

New life jackets were obtained for all boat and aircraft operations this year and the life raft was sent to the manufacturer for annual overhaul and Coast Guard inspection.

Safety meetings are not scheduled separately. Any unsafe practices or hazards noted are immediately brought to attention and corrections made. We think this is a better method than regular meetings and discussing what we can do or should do -- or perhaps what we should have done.

VII. OTHER ITEMS

Mr. Joe Johnson, Boat Operator and Maintenanceman, accepted a transfer and promotion to M&E Branch, Juneau to skipper the M/V POLAR BEAR. He was replaced by the very competent Maintenance Foreman Rex Williams from the Kenai Refuge. He is an avid boatman and has his own fishing vessel. Rex, his wife Betty, and two sons moved to Kodiak in June.

Refuge Managers Richard Hensel and Willard Troyer, formerly at the Kodiak Refuge, completed a 240-page monograph on brown bear. It is going through several critical reviews before publication.

Manager Hensel, Willard Troyer and Albert W. Erickson's paper, "Reproduction in the Female Brown Bear", was submitted to the editor of the Journal of Wildlife Management and Hensel was notified in December it will appear in the April 1969 issue of that publication.

The publication "The Breeding Biology of the Male Brown Bear" by Erickson, Moosman, Hensel and Troyer was published by the New York Zoological Society in Zoologica, Vol. 53, Issue 3, Fall, 1968.

We were fortunate in having three previous seasonal employees again this year. Two of these returned to college this fall for graduate studies on brown bear and bald eagle respectively, and the third member accepted temporary employment with the Bureau of Commercial Fisheries.

Refuge Manager Hensel and wife Mary welcomed another income tax deduction this year in the way of son Kurt Tyson, born on November 23.

The text of this report was written by Assistant Refuge Manager Berns and the typing accomplished by Mrs. Fredericksen.

Submitted by:

Richard J. Hensel
Refuge Manager

Vernon D. Berns
Assistant Refuge Manager

January 31, 1969

Approved by:

Refuge Supervisor

US FISH & WILDLIFE SERVICE--ALASKA
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Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Kodiak NWR MONTHS OF January TO May, 1968

(1) Species	(2) Weeks of reporting period: Jan 1	Feb 2	Mar 3	Apr 4	5	6	7	8	9	10
Swans:										
Whistling			4	20						
Trumpeter	0	0	0	0						
Geese:										
Canada				100						
Cackling				100						
Brant			200	1000						
White-fronted										
Snow										
Blue										
Other Emperor	2000	2000	1500	1000						
Ducks:										
Mallard	4000	4000	5000	8000						
Black										
Gadwall	0	0	0	1000						
Baldpate				2000						
Pintail			2500	8000						
Green-winged teal				5000						
Blue-winged teal				100						
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup	15,000	15,000	3000	500						
Goldeneye	2000	2000	2000	6000						
Bufflehead										
Ruddy	0	0	2000	2000						
Other Sea ducks	50,000	50,000	50,000	15,000						
Coot:										

Note: Inventory estimated only on a monthly basis. The refuge includes 800 miles of coastline in which the nearest boundary is approximately 20 miles from the refuge headquarters. Expense of making weekly surveys would be costly and is not budgeted for this refuge which is primarily dedicated to the management of brown bears and its habitat.

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(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Kodiak NWR MONTHS OF January TO May, 19 68

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling									720	0	0
Trumpeter											
Geese:											
Canada									500		
Cackling									500		
Brant									12,000		
White-fronted											
Snow											
Blue											
Other Emperor									195,000		
Ducks:											
Mallard											
Black											
Gadwall											
Baldpate									10,000		
Pintail									20,000		
Green-winged teal									235,000		
Blue-winged teal									50,000		
Cinnamon teal									1,000		
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup									975,000		
Goldeneye									356,000		
Bufflehead									40,000		
Ruddy											
Other									4,850,000		
Coot:											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	720	20	-
Geese	208,000	-	-
Ducks	6,221,000	67,000	-
Coots	0	0	0

SUMMARY

Principal feeding areas All salt water bays in Uyak, Zachar and Terror.

Principal nesting areas

Reported by Refuge Staff

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE KODIAK NWR MONTHS OF May TO August, 1968

(1) Species	(2) Weeks of reporting period: May 1	June 2	July 3	August 4	5	6	7	8	9	10
Swans:										
Whistling	28	28	70	70						
Trumpeter	0	0	0	0						
Geese:										
Canada	1000	0	0	0						
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other Emperor	3000	100	100	100						
Ducks:										
Mallard	2000	2000	2000	3500						
Black										
Gadwall										
Baldpate	150	150	150	150						
Pintail										
Green-winged teal	300	300	300	300						
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup	300	100	100	100						
Goldeneye	3000	3000	3000	3000						
Bufflehead										
Ruddy										
Other	8000	8000	8000	8000						
Coot:										

Note: Inventory estimated only on monthly basis. The refuge includes 800 miles of coastline in which the nearest boundary is approximately 20 miles from the refuge headquarters. Expense of making weekly surveys would be costly and is not budgeted for this refuge. The refuge is primarily dedicated to the management of brown bears and its habitat.

3 -17[illegible]
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE KODIAK NWR MONTHS OF May TO August, 1968

(1) Species	(2) Weeks of reporting period: May 11	June 12	July 13	August 14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling									6048	5	
Trumpeter											
Geese:											
Canada									7000		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other									14,800		
Ducks:											
Mallard									292,500		
Black											
Gadwall											
Baldpate									18,450		
Pintail											
Green-winged teal									36,900		
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup									18,500		
Goldeneye									369,000		
Bufflehead											
Ruddy											
Other									984,000		
Coot:											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	6,048	70	42
Geese	21,800	4,000	0
Ducks	1,719,350	13,750	600
Coots	-	-	-

SUMMARY

Principal feeding areas Karluk River, Uyak Bay, Terror Bay, Zachar Bay

Principal nesting areas Karluk Flats, Olga Bay Flats, Red River Flats

Reported by Refuge Staff

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3 -17
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE KODIAK NWR MONTHS OF September TO December 31, 19 68

(1) Species	(2) Weeks of reporting period: Sept. 11	Oct. 12	Nov. 13	Dec. 14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	80	100	20	0					5,700		
Trumpeter									0		
Geese:											
Canada	0	50	300	0					1,750		
Cackling		50	300	0					1,750		
Brant		1,000	0	0					5,000		
White-fronted									0		
Snow									0		
Blue									0		
Other Emperor	500	1,000	1,500	1,500					155,000		
Ducks:											
Mallard	2,000	5,000	5,000	3,000					450,000		
Black	0	0	0	0					0		
Gadwall	1,000	1,000							60,000		
Baldpate	1,000	3,000							90,000		
Pintail	2,000	3,000	100	100					156,000		
Green-winged teal	4,000	3,000							210,000		
Blue-winged teal									0		
Cinnamon teal									0		
Shoveler	100	25							3,750		
Wood									0		
Redhead									0		
Ring-necked									0		
Canvasback									0		
Scaup	1,000	1,000	10,000	12,000					720,000		
Goldeneye	6,000	6,000	5,000	2,000					510,000		
Bufflehead	4,000	4,000	2,000	0					300,000		
Ruddy									0		
Other Scoters, Harlequin, Old Squaw	8,000	9,000	30,000	60,000					3,210,000		
Coot:	0								0		

Note: Inventory estimated only on a monthly basis. The refuge includes 800 miles of coastline in which the nearest boundary is approximately 20 miles from the refuge headquarters. Expense of making weekly surveys would be costly and is not budgeted for this refuge which is primarily dedicated to the management of brown bears and its habitat.

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	5,700	100	0
Geese	143,500	2,100	0
Ducks	5,709,750	78,600	0
Coots	0	0	0

SUMMARY

Principal feeding areas Karluk River, Uyak, Zachar and Terror Bays.

Principal nesting areas Karluk, Red River Flats and Olga Bay.

Reported by Refuge Staff

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Kodiak NWR Months of January to May 195~~8~~9

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
N.A.										
II. Shorebirds, Gulls and Terns:										
Glaucous Gull	130,000	Year around resident								
Mew Gull	500	Feb.	500	April						
Arctic Tern	200	March	300	April						
Bonaparte's Gull	500	Jan.	1000	April						
								(Estimates only)		

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove							
White-winged dove							
IV. Predaceous Birds:							
Golden eagle	1						
Duck hawk	0						
Horned owl	0						
Magpie	12,000	Year around residents					
Raven	4,000	"	"	"			
Crow	8,000	"	"	"			
Bald eagle	400	Jan.	500	April	Year around residents		
Goshawk	20	Jan.	40	April			
Shorteared owl		April	12	April			
Peregrine falcon		March	16	March			

Reported by Refuge Staff

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge KODIAK NWR Months of May to August 194 68

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
N.A.										
II. Shorebirds, Gulls and Terns:										
Glaucous Gull	130,000	Year Around Residents					35	30,000	75,000	205,000
MewGull	2,000		2,000	May				700	1,400	3,500
Arctic Tern	400	May	600	May				150	300	2,000
Bonaparte's Gull	1,500		1,500	May				400	800	5,000
Lesser Yellow Legs	50	June	300	July	50	Sept.				300
Common Snipe			5,000	Aug.						25,000
Sandpiper (unident.)	5,000	June	8,000	July				1,200	2,500	9,000

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:	N.A.									
Mourning dove										
White-winged dove										
		Estimates Only								
	0									
IV. Predaceous Birds:	0									
Golden eagle	0									
Duck hawk	4,500		12,000	Sept.	Year	Around	Residents	2,000	4,500	12,000
Horned owl	1,800		4,000	Sept.	"	"	"	700	1,200	4,000
Magpie	3,500		8,000	Sept.	"	"	"	1,800	2,800	8,000
Raven	600		800	Aug.	"	"	"	160	330	800
Bald Eagle	30		60	Sept.					35	
Crow	6	June	12					6	10	60
Goshawk	16	June	16					6	8	12
Short-eared owl										
Peregrine Falcon										

Reported by Refuge Staff

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge KODIAK NWR Months of September to December 31, 194

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
N.A.										
II. Shorebirds, Gulls and Terns:										
Glaucous Gull	130,000	Year Around Residents								
Mew Gull	500	"	"	"						
Bonaparte's Gull	300	"	"	"						
Common Snipe			10,000	Sept.	2,000	Nov.				
Sandpiper (unidentified)			8,000	Sept.	500	Nov.				

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:	N.A.								
Mourning dove									
White-winged dove									
IV. Predaceous Birds:									
Golden eagle	1	Rare							1
Duck hawk	20				8	Oct.			20
Horned owl	0		0		0				0
Magpie	12,000	Sept.		Year Around Residents					12,000
Raven	4,000	Sept.		"	"	"			4,000
Crow	8,000	Sept.		"	"	"			8,000
Bald eagle			800	Sept.	Year Around Residents				800
Goshawk		Sept.	60	Sept.		Nov.			60

Reported by Refuge Staff

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge KODIAK NWR For 12-month period ending August 31, 1968

Reported by Refuge Staff Title

(1) Area or Unit Designation	(2) Habitat Type	Acreage		(3) Use-days	(4) Breeding Population	(5) Production
(Estimates only)	Crops	0	Ducks	13,700,100	300	900
	Upland	1,415,000	Geese	433,800	0	0
	Marsh	120,000	Swans	13,800	28	42
	Water	280,000	Coots			
	Total	1,815,000	Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1750c
Form NR
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge KODIAK NWR

Year 1968

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
			N.A. - Did not check hunters on this refuge.					

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form R-2
(April 1946)

UPLAND GAME BIRDS

Refuge Kodiak NWR Months of January to May, 1948

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ptarmigan	600,000	15	0		50:50	100	0	0	40,000	Estimates only.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form No. 2
(April 1946)

UPLAND GAME BIRDS

Refuge KODIAK NWR Months of May to August 31, 1968

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifioally requested. List introductions here.
Ptarmigan	600,000	15	-	-	50:50	200	0	0	40,000	Estimates only

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form No. 2
(April 1946)

UPLAND GAME BIRDS

Refuge KODIAK NWR Months of September to December 31, 1968

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ptarmigan	600,000	15	0		50:50	150	0	0	40,000	Estimates only

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-175
Form NR-3
(June 1945)

BIG GAME

Refuge KODIAK NWR Calendar Year 1968

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Brown bear	1,600,000	300	86									1,800	1,704	70:30
Black-tailed deer	200,000	275	200									1,000	800	50:50
Reindeer	400,000	100	40									750	710	50:50

Remarks:

Reported by Refuge Staff

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116000

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Kodiak NWR Year ending April 30, 1962

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Red fox	674,000	300	50	30	0	0	0	N.A.						2,250
Land otter	400,000	300	0	100	0	0	0							1,350
Weasel	674,000	100	0	0	0	0	0							6,740
Beaver	400,000	500	0	70	0	0	0							800
Varying hare	674,000	30	200	0	0	0	0							22,500

* List removals by Predator Animal Hunter

REMARKS: Estimates only.

Reported by Refuge Staff

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

116007

3-175
Form R-5
60701

DISEASE

Refuge KODIAK NWR Year 19 68

Botulism NONE AT THIS REFUGE

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge KODIAK NWR Year 19 68

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: NONE AT THIS REFUGE

INTERIOR--PORTLAND, OREGON

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING 1968

Refuge KODIAK NWR County _____ State ALASKA

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
NONEAT THIS REFUGE									
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations _____ Haying Operations _____ Grazing Operations _____

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				
				2. Other				
				1. Total Refuge Acreage Under Cultivation				
Hay - Wild				2. Acreage Cultivated as Service Operation				

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge KODIAK NWR Months of _____ through _____, 195_

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
NOT APPLICABLE											

(8) Indicate shipping or collection points _____

(9) Grain is stored at _____

(10) Remarks _____

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 59323

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge KODIAK NWR Year 1951

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
NONE AT THIS REFUGE								

Total acreage cut over ..... Total income .....

No. of units removed B. F. ..... Method of slash disposal .....
Cords .....
Ties .....
.....

INT.-DUP. SEC., WASH., D.C. 36103

(9/63) Bureau of Sport Fisheries and Wildlife

Refuge: KODIAK NWR

ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number:

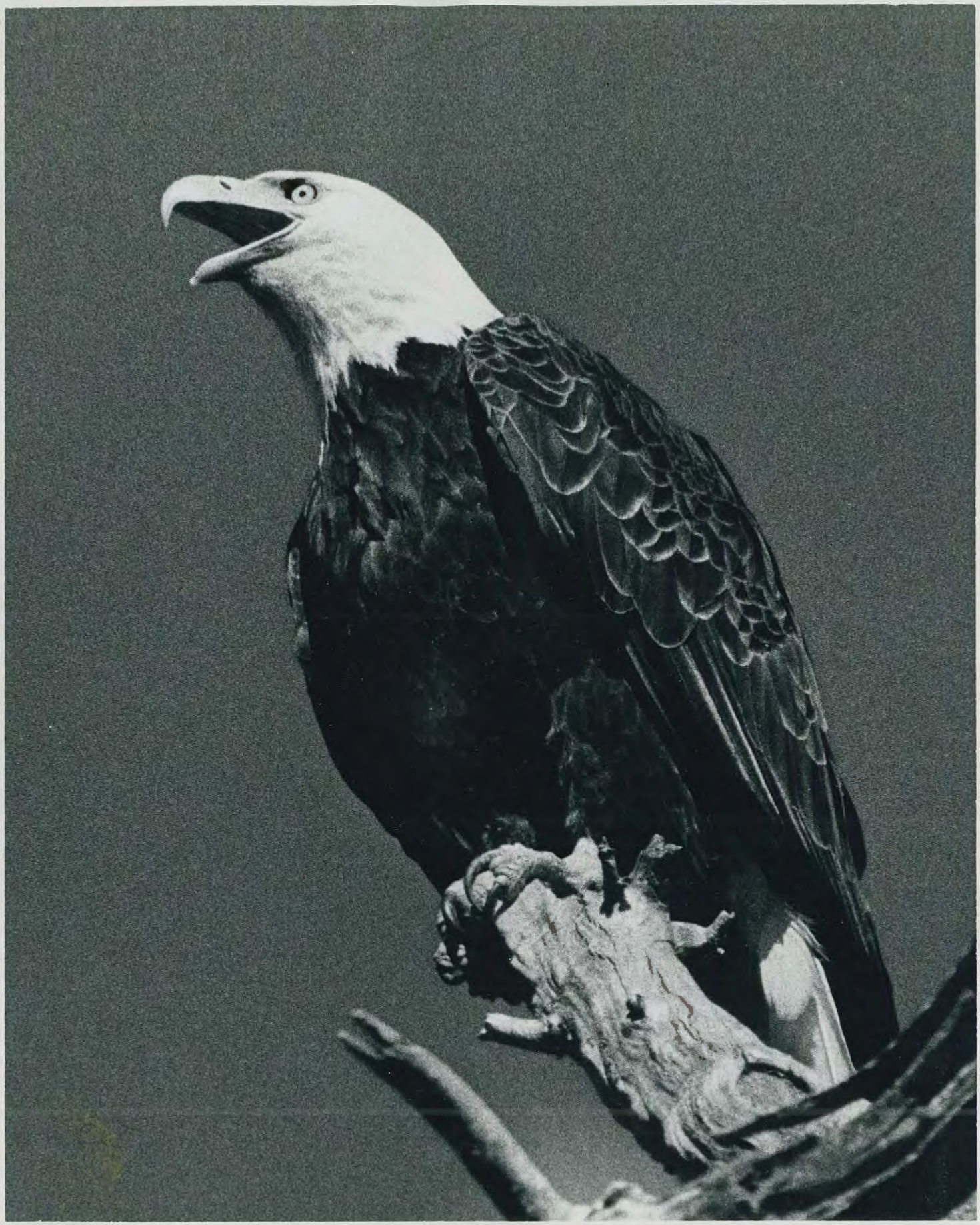
Reporting Year: 1968

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			NOT APPLICABLE AT THIS REFUGE					

10. Summary of results (continue on reverse side, if necessary)

35500



Adult bald eagle perched near Karluk Lake. Photo by Blott

Mountain goat habitat. Many animals are forced to lower slopes during severe winters.
Photo by Berns

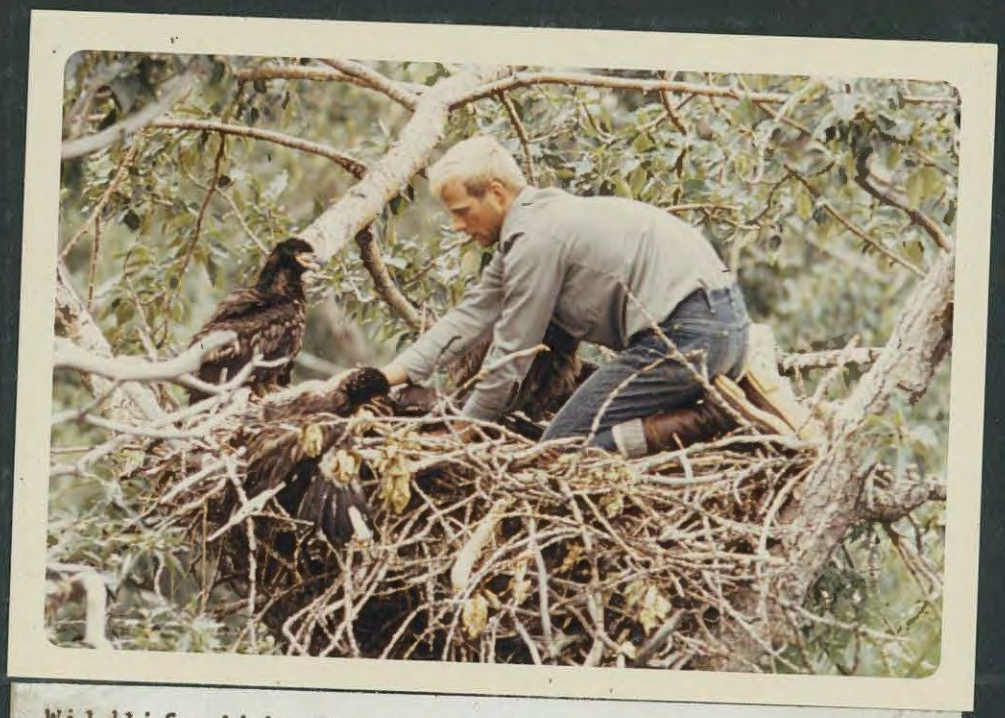
A small band of mountain goats encountered during an aerial survey (see arrows and note tracks).
Photoby Berns

Refuge Manager Hensel about to release a rare visitor to Kodiak Island - a golden eagle. Photo by Fredericksen

Wildlife Aide Jim Gilbert using a D-11 receiver near Karluk Lake to monitor a radio-collared bear. Photo by Berns

Clerk-Steno Phyllis Fredericksen arriving for work during a winter morning.
Photo by J. Fredericksen

Assistant Refuge Manager Berns testing a radio transmitting collar as of final stage.
Photo by Gilbert



Wildlife Aide Terry Grubb banding bald eaglets; 179 eaglets have been banded to date at this refuge. Photo by Blott

Wildlife Aide Blott holding a brown bear cub which was sent to the Woodland Park Zoo in Oregon. Photo by Hensel

Cub of the year displaying an interest in a red salmon. Photo by Berns

Checking a lip tattoo of a recaptured bear. This technique is superior to the cattle tattooing method used in the past. Photo by Berns

Assistant Refuge Manager Berns preparing a radio collar for an anesthesized bear. The transmitter shown has 4 banks of mercury batteries.

Completed radio transmitter used for an 850-pound brown bear. Signals can be heard up to 10 miles on a line of sight with this type of collar. Colored plastic tape is used for visual identification.