NARRATIVE REPORT

OF

ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE

AND

IZEMBEK NATIONAL WILDLIFE RANGE

SEPTEMBER - DECEMBER 1961

NARRATIVE REPORT

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ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE
Cold Bay Alaska

and

IZEMBEK NATIONAL WILDLIFE RANGE

U.S. Dept. of the Interior
Bureau of Sport Fisheries and Wildlife
Fish and Wildlife Service
Cold Bay, Alaska

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ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE
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I. GENERAL

A. Weather Conditions.

The cold, wet fall weather continued into winter with a long cold period in late December. It was during this period that Izembek Bay froze with ice extending into the Bering Sea. Cold Bay was incrusted with ice as far out as one-half mile from the beach. This ice remained until January when the winds changed to the south.

CLIMATOLOGICAL DATA FOR COLD BAY AREA from the WEATHER BUREAU

		Sept.	Oct.	Nov.	Dec.
Temperature	Max.	58	58	49	47
	Min.	36	20	22	4
	Ave.	48.0	38.8	35.5	26.3
Precipitation (in.)		1.93	1.88	4.10	2.79
Snow & Sleet Total		T	.07	3.5	4.9
Winds (MPH)	Max.	40	55	54	48
Ave. for month (MPH)		15.4	18.0	19.4	16.5
Peak Gusts (MPH)		46	76	75	64

B. Habitat Conditions.

1. Water. Lakes and streams remained normal to above normal throughout the period.

2. Food and Cover.

a. Eelgrass Studies. In early October, Dave Spencer joined our staff at Cold Bay, bringing with him the Refuge Cessna 180 equipped with amphibious floats. The performance of this arrangement is substandard but as the thing was equipped for operation of our aerial camera and no alternative was available we proceeded with aerial photography of Izembek Bay. Both black-and-white and color film were employed. The objective was to secure a basis for computing the area of eelgrass (Zostera marina) beds in the Bay.

Initial studies of the eelgrass in the Bay indicate a difference of vegetative growth and seed production as the depth varies. Not all of the bars in the Bay support a growth of eelgrass, and those that do ha a deposition of organic mud overlying sand or gravel. These are not associated with the salt water openings to Bering Sea nor the largest streams entering the Bay. Eelgrass beds are found in most of the back-waters of the Bay and where the tidal currents are modest. In the swif currents of the channels, the sand, gravel, and marine shells are in motion at the peak of the flow—moving first one direction and then the other. This is most true at the point where these channels debouch into Bering Sea. Near these exits the current over the bars is also swift and the bottom material is carried along by it. Where the current is swiftest no eelgrass grows, but there is a gradation at the edge of the beds where groups and single plants survive. If our evaluation of the marshy areas whose edges form part of the present shoreline of Izembek Bay is correct, the gradation of groups and single plants recorded in the paragraph above represents a gradual encroachment of eelgrass on the sandy bars of the Bay's entrances. The heavy, organic, peaty nature of the marsh soils and their vegetative cover; as distinct from the light, air-transportable soils—and the characteristic heath cover—that adjoin the marsh suggests that the marsh soils are formed of decomposed eelgrass in contrast to the volcanic ash and decomposed volcanic rock of the heath and grasslands.

At the head of Moffett Bay a large stream enters the Bay through three distributaries. The volume of water is sufficiently large that under low tide conditions fresh water can be obtained a mile offshore in the Bay. This stream carries a heavy load of highly abrasive ash from Left and Right Hand Valleys. On the delta of this stream eelgrass growth is unsuccessful.

Vegetative growth of eelgrass in Izembek Bay is longest in the deeper water, i.e., where it grows, it does not grow in the deepest water of the Bay. In the shallower water, seed production is greatest. Thus on the bars that are bare to air and sunlight are found seed masses of use to the pintails. Let it not be supposed that these bars and the plants are dry for where this is approached the plants do not grow. During low water and until flooded by the returning tide there is a large volume of water on the bars covered with eelgrass, despite the recession of tide below this level. This water flows toward the channels but because of the small gradient moves very slowly.

It is perhaps unnecessary to point out that the eelgrass beds constitute a habitat within which an enormous community of marine invertebrates dwells. This, of course, supports the divers that inhabit the Bay and as accidental admixtures (mostly small gastropods of the genus (Littorina) augments the diet of the dabblers.

We do not presume to understand the reasons but the fact is that the eelgrass beds in Izembek Bay produced a markedly denser growth this year than usual. This was apparent from the difficulty of operating outboard-engine-powered boats not only in the beds themselves but in the channels where much greater quantities of free eelgrass was floating.

b. Berries of the Heath. On the uplands a somewhat larger than usual crop of the berries of the heath reached maturity. In early August it was thought that the crop would be quite large based on observations of developing fruit of Vaccinium vitus-idea at that time. This was, however, not realized.

II. WILDLIFE

A. Migratory Birds.

1. Geese. Since we did not return from the western Aleutians until August 29 we do not know when the waterfowl concentration began to form. However, by that time lesser Canada geese, emperor geese, and brant were in Izembek Bay. From September 1 to about the 15th there was a large increase of birds. From that period until the migration southward there appeared to be little change in the population.

Several birds taken in early September were checked. For the most part all were thin and possessed many pinfeathers. This caused quite a few local hunters to wait until later in the month and early October before they commenced hunting in earnest.

An observation flight was made in September from False Pass to Moffett Bay in an effort to take a census of the birds. The birds were scattered from the lakes back of Applegate Cove to Moffett Bay. A rough estimate was formed that there were in the Izembek Bay area this fall a quarter-million brant to utilize the eelgrass before migration southward. We deemed this population to be larger than any in the past two or three years.

October 16 we observed five snow geese inland from Applegate Cove, in the midst of a large mass of lesser Canada geese. Again on the 22nd a juvenile snow goose was observed in a salt water slough with lesser Canada geese. A local hunter later reported having seen a small number of snow geese earlier in the season.

The migration of geese appears to have begun the 22nd of October although we were not certain of this until the following day. On the 23rd we watched several very large flocks of brant embark on their migration from Izembek Bay. Our position was on Grant's Pt. and most of the flocks were moving from west to east at the higher levels (this appeared to be about 2000 feet) and the reverse flow at low levels. Wind direction was northwest 20 knots. Apparently some effort is

required to reach the migrating altitude for the birds can be observed in an amorphous flock pursuing various headings for 15 to 20 minutes before making any progress. Migrating brant do not, at least at this point in their route, form into the marked echelons characteristic of Canada geese; the flocks are more "bunched."

We have not yet determined the passes chosen by brant crossing the Alaska Peninsula on the way south but it seems likely they use the same ones as when north bound. Save possibly one, these passes are all east of Grant's Pt. and would account for the direction of flight given above.

We did not observe Canada geese in migration the 23rd but as these birds pursue a different pattern one could not reasonably expect to see them from Grant's Pt. Based on earlier experience we assume they did begin the migration at the same time as the brant.

On the 28th flocks of geese, both brant and Canada type were observed in migration. From the 26th through the end of the month winds were north to northwest and it is likely that in these 6 days the bulk of the geese left Izembek Bay for the population declined sharply. The last two flocks observed were southbound on November 12th.

The majority of goose hunters were from the Air Force "duck camp." They reported 153 hunters, with a kill of 457 emperor geese, 164 lesser Canada geese, 2 Richardson's geese (authors note: no doubt cackling Canada geese), and 104 black brant. Total: 727 geese, or 4.7 geese per man during a three day stay at the hunting camp.

In previous years it was the practice of this camp to employ vehicles off the roads for hunting; heavy four or six-wheeled-tired vehicles on the old trails (World War II) and a "weasel") across the heath and marshes. This year, with the creation of the Izembek Range, we terminated this practice by pointing out the provisions of 50 CFR 26.14.

2. Ducks. The largest population of game ducks in Izembek Bay is that of the pintails. Large concentrations were observed on the bigger lakes at times of high tide in the Bay. At low tide, these birds are scattered over the exposed bars feeding on eelgrass seeds. This species is almost as exclusive in its diet as the brant, which bird feeds wholly on the vegetative portions of the eelgrass. Pintails harvest the starch-rich nutlets of the same plant to the almost complete exclusion of other forms Quite evidently it is a completely satisfactory diet for the handsome birds deposit a layer of subcutaneous fat paralleling that of a harbor seal (Phoca vitullina)

Mallards and gadwalls made up the bulk of the Air Force hunters' bag. Majority of the gadwalls were taken by hunters in the area near the Federal Aviation Agency outer marker. Our information indicates this is also true of the mallards but we cannot verify it.

Below is a table of the waterfowl taken by the "duck camp" in 1960 and 1961.

TABLE I - Ducks taken by Air Force hunters of the "duck camp".

	1960 132 hunters	1961 153 hunters
Mallard	78	95
Greater scaup	9	11
Gadwall	53	89
Green-winged teal	12	42
Pintail	70	13
Merganser	0	6
Bufflehead	0	2
Goldeneye	0	1
Steller's eider	0	3
Shovelers	3	0
Harlequin	6	0
Widgeon	11	0

These figures form a graphic illustration of what happens when roadways encroach on wildlife habitat. When the FAA established the outer marker as part of the instrument landing system of the Cold Bay air facility in 1958 they placed it on the shore of the largest slough of Izembek Bay. For access they built a road that passed close by another sizeable slough. Inland from these two sloughs is an extensive complex of lakes and ponds that until the road was built was the resting and watering site of the birds using the central part of Izembek Bay. The marsh area incident to it was and still is one of the more important waterfowl nesting areas adjacent to the Bay. One of the many small red salmon runs of Izembek Bay, that in the aggregate amount to a sizeable total, finds its spawning grounds in the stream flowing into the large lagoon. It was, until the road was built, an important brown bear habitat. This office did, and will again ban waterfowl in flightless condition prior to waterfowl hunting season in this area. In 1955 when banding late nesters there we encountered other wildlife. The following paragraph is quoted from our narrative of August 1955.

"Biggest problem were the bears that chose to sleep in the tall grass of the marshes. We felt it necessary to carry the .375 magnum for in careering madly behind a dog through waist-high to shoulder-high grass the possibility of landing astride a suddenly awakened bear was very real. We flushed nine of them from the marsh the first day and though some were encountered at sufficiently close range to make out the individual whiskers on their muzzles, they all took to their heels in panic. But the big rifle was a nuisance." (Thanks to the FAA, that nuisance will not be necessary next time).

We quote now from our narrative of October 1954. The area is the same one from which we flushed the nine bears above and from which in 1960 and 1961 the "duck camp" hunters secured the bag tabulated above.

"On the fifth of October, when we visited one small area of ponds in company with regional and central office personnel, there were two such flights (authors note: referring to flights from the Bay to inland areas on the flooding tide) of pintails observed that numbered approximately 1500 birds in each case. Moreover, there was an almost uninterrupted movement of small flocks of pintails and other ducks into the area for several hours."

Let it be remembered that of the ducks in Izembek Bay during the fall months, i.e., the period with which this report is concerned, there is an overwhelming preponderance of pintails, something in the order of a quarter-million specimens, with the nearest second species being the Steller's eider of about 40,000. The mallards probably number between 15,000 and 20,000 birds and the gadwalls are relatively scarce. Based on our information it is doubtful that there are 1,000 gadwalls in the whole area. (We ~~have~~ banded gadwalls in the small area with which we are now concerned).

It is clear from the bag record of the "duck camp" that the pintails have forsaken the area. Fortunately, Izembek Bay is large enough to absorb this displacement and furnish an example of what happens when a road is constructed into wildlife habitat. All sorts of rationalizations are offered for this and other roads into wildlife habitat but they remain unconvincing when viewed from the record of what happened.

The first hard freeze occurred on October 29 causing the ducks to concentrate in the streams and spring-fed potholes. Freezing and thawing conditions continued throughout the rest of the waterfowl season and the birds divided their time between the streams and Izembek Bay.

3. Swans. Swans were seen all fall in the lake above Trout Creek just outside the town. Two swans were observed as late as November 15 in a lake near Simeon Mountain.

Thus far the only species found in this area is the whistling swan. A telescope with a 60-power lens was used on various occasions to check the lores and in each case the birds proved to be whistling swans.

B. Upland Game Birds.

Ptarmigan appear to be on the upward trend as compared to last year. Some of the early birds taken did not have fully developed primary feathers and were light in weight indicating that the adult birds were late in nesting. Even inexperienced ptarmigan hunters noticed the difference between the birds.

In one aerial survey with Mr. David Spencer, ptarmigan were observed in the flats of Applegate Cove, around Frosty Mountain, in Right and Left Hand Valleys, and the flats towards Pavlof and Canoe Bay. This

indicated they were well distributed throughout the area and not concentrated to just a few areas. It was common to flush four to eight birds while walking over the heath, and occasionally flocks of 30 to 100 in the alder patches.

C. Big-Game Animals.

1. Brown Bear. There were only a few brown bears in and around Cold Bay this fall. Local hunters took two bears (i.e., around Cold Bay) ranging from six to seven feet. Three other bears were seen close to town.

Mr. Mike Uttecht, big-game guide, took one hunter to the Moffett Bay area where his hunter shot a 10½ foot bear. This old female had some of its teeth worn to the gums and was estimated by the Alaska Department of Fish and Game in Anchorage to be about 25 years old. (Authors note: We recorded the reported size and the A.D.F.&G. age estimate for whatever it may be worth).

On a flight in Left Hand and Right Hand Valleys in early October, nineteen brown bears were counted along the streams and sloughs. This is some of the best bear habitat on the Izembek Range.

2. Caribou. Caribou are on the increase on the tip of the Alaska Peninsula. Small bands of 10 to 20 animals were sighted in the Applegate Cove Flats, Morzhovoi Bay, around Frosty Mountain, and Pavlof Bay areas. The largest band reported was about 80 animals on the northeastern slopes of Frosty Mountain.

D. Other Animals.

One sea otter was sighted near Morzhovoi Bay while in flight to False Pass on September 25.

As late as November 30, we saw a ground squirrel run from a burrow. This rather late in the year for this rodent not to be in hibernation.

Weasels were more abundant this fall than they have been in several years. One little fellow moved into the Berns' Quarters. After a merry chase around the living room it was finally caught. Needless-to-say the house needed an airing afterwards. Five or six others were seen around dwellings of Cold Bay. Earlier in the fall one made its home around a boat on the beach of Grants' Point, Izembek Bay. The increase in the weasels indicates a population growth of the small rodents i.e., lemmings, shrews, and mice.

Numerous sightings of land otters were made this fall by the local people and reported. From the three otters taken thus far during the trapping season we obtained the following information.

1.	Female	large	24 pounds
2.	Male	medium	16 pounds
3.	Male	large	22 pounds

As the winter progresses signs of red foxes and wolverines become more numerous around the Cold Bay and Air Force Site garbage dumps.

Arctic hares have frequently been seen this fall and winter. One female taken on December 28 weighed 9¼ pounds. Weights have been estimated as high as 15 or 16 pounds on some of the other hares taken. (Authors note: No Arctic hares taken in the Cold Bay area have, when weighed, exceeded 9¼ pounds).

G. Fish.

Silver salmon sport fishing was good in Russell Creek until the middle of October. Small schools of silvers were seen in Cold Bay as late as September 24. The larger fish appear to arrive at Russell Creek late in the run. Over Labor Day week-end we obtained the weights of several fish and they ranged from 5 to 12 pounds. During the middle of the month several more silvers were taken and their weights ran from 8 to 15 pounds. One steelhead of 4 to 5 pounds was taken in Russell Creek by a lucky fisherman during the Labor Day week-end Silver Salmon Derby.

With the opportunity to catch a silver salmon, the dolly varden fishing took a sharp decline although they were easy to take with a small lure. The cold, windy weather and ice on the lakes did not create any great interest in ice fishing.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

The roof on Berns' Quarters was given a coat of tar, however, there are still leaks. Battens securing the tar paper will have to be removed and the nail holes tarred before all the leaks can be stopped. Many of the battens are so rotten they would have to be replaced. To render the building in good condition would be more expensive than it is worth.

Maintenance on the furnace was completed after three weeks of cold, damp weather and no heat in Quarters Number Two. Parts were mis-sent from Anchorage to the Pribilof Islands on its one-trip-a-week plane. After waiting another ten days for the parts to return, the unit would not work and had to be returned to Anchorage for different parts.

In November, an agreement was made with the Federal Aviation Agency to maintain our vehicles. Since then both vehicles have been given minor overhaul and new brakes installed.

New office space was acquired in the FAA K-Building. It was painted, electrical outlets installed, and office furniture moved in.

Primary surveying was started on the Izembek Range and the first boundary signs were posted along the main roads.

Figure 1. Refuge Managers Jones & Berns posting boundary signs on the Izembek Range.

IV. RESOURCE MANAGEMENT

Two(2) permits were issued to spring bear hunters on Unimak Island.

One (1) free use permit was issued to the Federal Aviation Agency for removal of 48,000 cubic yards of gravel from the Izembek National Wildlife Range.

V. FIELD INVESTIGATIONS AND APPLIED RESEARCH

A. Progress Report.

1. Duck Banding. We returned from Amchitka late in August and immediately shifted to banding Steller's eiders in Izembek Bay. From previous experience we knew the moulting birds could be driven up the channels that exist in the Bay at low tide. These river-like channels terminate on the exposed bars and oblige the birds to cross afoot to open water. At this point they are vulnerable, but as it developed not quite as vulnerable as we had expected. Our initial effort produced a great deal of exercise, a very few ducks, and several wet persons. At the end of the second day's enterprise during which we had under quasi-control several hundred of the eiders it was clear that we needed to refine our methods.

Our ultimate method was to herd the scattered flocks that we encountered in the wide, deep channels into a gradually narrowing one that we knew terminated on an exposed bar. To this end we used two boats, the dinghy and the speed skiff. As we progressed toward the head of the channels we left the boats (anchored, against the incoming tide) and proceeded afoot. The process had to be accomplished steadily but the birds could only be pushed so fast. When thus brought almost to the upper end of a channel we stopped and "held" the flock while quickly erecting a trap (constructed of stakes and webbing) at the very head of the channel. All that remained was to drive the flock the rest of the way and close the entrance. This process is over-simplified as any duck bander will recognize, especially as we were dealing with excellent divers. They had some views of their own, with the result that this writer "batted 1,000" in coming home wet.

Figure 2. Boats being readied to drive eiders. (Note low tide, eelgrass and MUD.)

Figure 3. Trying to hold the birds while trap is being set.

Figure 4. Driving birds toward the trap.

Figure 5. A lot of work and few birds. (Note incoming tide)

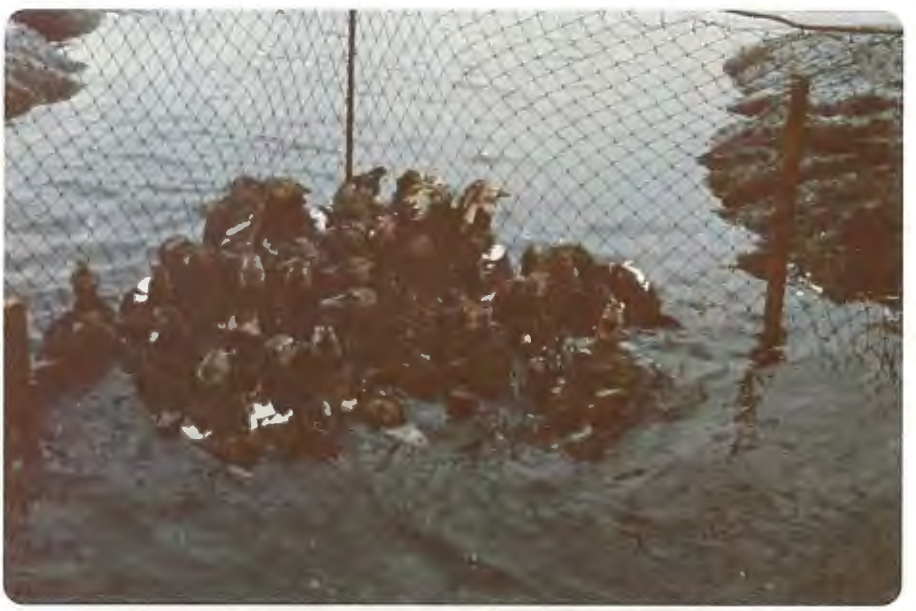

Figure 6. Our catch for the day.

Figure 7. Mrs. Berns recording band numbers.

Figure 8. Rolling the boat up on the beach after days banding. Tired-wet & Happy!

We continued to work one area with dwindling results for the birds became wary of us and developed evasive tactics. Recaptures in the drives indicated that the birds remained at least for this period in rather restricted areas. Unlike dabblers with which we had been working the eiders continually attempted to escape even when held in the hand, and their sharp nails inflicted many scratches on our cold hands. Our greatest success was when the tides were lowest. The results were deemed satisfactory: 466 birds banded. Sex ratio: 323 drakes, 143 hens. This was quite a surprise to us in view of the difficulty we experienced securing drakes when in 1959 we caught birds to send to Delta and The Wildfowl Trust.

2. Band Recoveries. We have tabulated band recoveries from this area, in so far as we have any record of them, and make them a matter of record below. We have also recorded the bands placed on birds in this area and recovered elsewhere.

	Species	Date banded	Where banded	Sex	Where recovered	Date
1	Greater scaup	9-19-1954	Cold Bay, Alaska	F	Izembek Bay, Alaska	10- 9-1954
2	Mallard	8-12-1955	Izembek Bay, Alaska	J	Cold Bay, Alaska	11-11-1955
3	Gadwall	8-13-1957	Izembek Bay, Alaska	M	Lake Andrews, Adak, Alaska	11-15-1958
4	Pintail	8-16-1955	Izembek Bay, Alaska	J	Izembek Bay, Alaska	10- 2-1955
5	Green-winged teal	8- 6-1955	Izembek Bay, Alaska	J	Santa Ana, California	11-12-1955
6	Green-winged teal	8-16-1955	Izembek Bay, Alaska	J	Izembek Bay, Alaska	9- 1-1955
7	Black brant	9-28-1952	Izembek Bay, Alaska	M	Boundary Bay, B.C., Canada	12-13-1953
8	Black brant	9-28-1952	Izembek Bay, Alaska	F	Boundary Bay, B.C., Canada	12-13-1953
9	Black brant	9-27-1952	Izembek Bay, Alaska	F	Toquart, Vancouver Is., B.C., Canada	2-27-1954
10	Black brant	9-12-1952	Izembek Bay, Alaska	M	Drakes Estero, California	12-30-1952
11	Glaucous-winged gull	8- 1-1955	Cold Bay, Alaska	J	Anadyr, USSR 64°N 176°E	9-19-1955
12	Glaucous-winged gull	8- 1-1955	Cold Bay, Alaska	J	Mountain Village, Alaska	9-10-1956

	Species	Date banded	Where banded	Sex	Where recovered	Date
1	Emperor goose	7-17-1950	Lower Kashunuk River, Alaska	M	Lenard Harbor, Cold Bay, Alaska	10- 5-1951
2	Emperor goose	7- 5-1950	Manoganuk, Hazen Bay, Alaska	-	Izembek Bay, Alaska	9-26-1951
3	Emperor goose	8- 2-1950	Manoganuk R., Hazen Bay, Alaska	M	Sanak Is., Alaska	Fall of 1951 or 52
4	Emperor goose	7-21-1952	North Mouth Yukon R., Alaska	F	Izembek Bay, Alaska	9-10-1958
5	Pintail	11-13-1949	Tule Lake, Refuge, Calif.	M	Izembek Bay, Alaska	9-11-1950
6	Pintail	8-19-1949	Lower Klamath Refuge, Calif.	M	Izembek Bay, Alaska	10-10-1950
7	Pintail	12- 1-1953	Los Banos, Calif.	M	Izembek Bay, Alaska	9- 5-1955
8	Pintail	7-19-1956	Wilkie, Saskatchewan, Canada	F	Izembek Bay, Alaska	9- 1-1957
9	Pintail	10- 6-1957	41°50'N 121°40'W. Calif.	-	Izembek Bay, Alaska	Fall-1961
10	Pintail	3- 2-1960	39°20'N 121°40'W. Calif.	-	Izembek Bay, Alaska	Fall-1961
11	Black brant	8-14-1952	Lower Kashunuk River, Alaska	-	Morzhovoi Bay, Alaska	10- 1-1954
12	Black brant	7-30-1953	Lower Kashunuk River, Alaska	F	Morzhovoi Bay, Alaska	Fall-1954
13	Black brant	7-30-1953	Lower Kashunuk River, Alaska	M	Izembek Bay, Alaska	10- 7-1954
14	Black brant	7-29-1950	Uphun River, Hazen Bay, Alaska	F	King Cove, Alaska	10- 1-1950
15	Black brant	7-19-1950	Lower Kashunuk River, Alaska	F	King Cove, Alaska	10- 1-1950

	Species	Date banded	Where banded	Sex	Where recovered	Date
16	Black brant	7-28-1949	Lower Kashunuk River, Alaska	F	Izembek Bay, Alaska	10- 5-1950
17	Black brant	7-30-1953	Lower Kashunuk River, Alaska	M	Morzhovoi Bay, Alaska	10----1953
18	Black brant	7-30-1950	Uphun River, Yukon Delta, Alaska	F	Caton Is., Alaska	Feb. 1951
19	Black brant	8-12-1952	Lower Kashunuk River, Alaska	-	Izembek Bay, Alaska	9-10-1952
20	Black brant	8-12-1952	Lower Kashunuk River, Alaska	F	Izembek Bay, Alaska	11-13-1952
21	Black brant	8-15-1952	Lower Kashunuk River, Alaska	M	Cold Bay, Alaska	9-16-1952
22	Black brant	8-12-1952	Lower Kashunuk River, Alaska	-	Izembek Bay, Alaska	10- 5-1952
23	Black brant	8- 9-1952	Lower Kashunuk River, Alaska	F	Izembek Bay, Alaska	10-25-1952
24	Black brant	7-28-1951	Nelson Is., Yukon Delta, Alaska	F	Izembek Bay, Alaska	9- 1-1952
25	Black brant	7-21-1951	Kashunuk Slough, Alaska	-	Izembek Bay, Alaska	9-12-1952
26	Black brant	7-17-1951	Kashunuk River, Alaska	M	Izembek Bay, Alaska	9-23-1951
27	Black brant	7-29-1950	Uphun River, Hazen Bay, Alaska	M	Izembek Bay, Alaska	9-23-1951
28	Black brant	8- 9-1952	Lower Kashunuk River, Alaska	-	Morzhovoi Bay, Alaska	9- 8-1953
29	Black brant	7-28-1951	Kashunuk Slough, Alaska	-	Kinzarof Lagoon, Alaska	9- 7-1953
30	Black brant	8-12-1952	Lower Kashunuk River, Alaska	F	Kinzarof Lagoon, Alaska	9- 7-1953
31	Black brant	8-14-1952	Lower Kashunuk River, Alaska	-	Izembek Bay, Alaska	10-16-1953

	Species	Date banded	Where banded	Sex	Where recovered	Date
32	Black brant	8-12-1952	Lower Kashunuk River, Alaska	M	Izembek Bay, Alaska	9-27-1953
33	Black brant	7-16-1950	Lower Kashunuk River, Alaska	M	Izembek Bay, Alaska	9-22-1954
34	Black brant	8-13-1952	Lower Kashunuk River, Alaska	F	Izembek Bay, Alaska	9- 9-1955
35	Black brant	7-29-1951	Black River, Yukon Delta, Alaska	F	Izembek Bay, Alaska	10-10-1955
36	Black brant	8-12-1952	Lower Kashunuk River, Alaska	-	Morzhovoi Bay, Alaska	10----1955
37	Black brant	3-16-1953	Beatrice, Calif.-		Izembek Bay, Alaska	10-18-1958
38	Black brant	7-30-1954	Lower Kashunuk River, Alaska	F	Izembek Bay, Alaska	9-26-1958
39	Black brant	7-26-1954	Lower Kashunuk River, Alaska	F	Izembek Bay, Alaska	10- 6-1957

Despite the very large numbers of Canada-type geese in the Izembek Bay area, both lesser Canada and cackling Canada, only a single band has been recovered and of this one we do not have direct knowledge. It is a band recovered in 1953 from the Izembek Bay area and reported in Nelson and Hansen, The Cackling Goose - Its Migration and Management.

One other band is of interest. On March 10, 1961 a magpie was banded in the settlement of Cold Bay. This bird disappeared with the rest at the onset of summer and returned in the fall.

Glaucous-winged gulls were banded on the islands in Blinn Lake at Cold Bay 1953, '54, and '55. In 1957, when the gulls went through the motions of nesting there but failed to lay any eggs we collected 36 but failed to recover any bands.

VI. PUBLIC RELATIONS

A. Recreational Uses.

Public relations between the Service and the Air Force duck camp was very good as it has been in the past. They had a Wildlife Conservation Officer in their camp throughout the season who checked all incoming visitors for hunting licenses and duck stamps. He also kept a record of the number of birds taken.

Berry picking, beach combing, and fishing were uses made by the public in addition to the bird and big-game hunting during this period.

B. Refuge Visitors.

Name	Title	Organization	Purpose
George Price	Major, USAF	714 A.F. Site	Visit
Shirley Kragh		Colo. Springs, Colo.	Visit
David Spencer	Refuge Supervisor	BSFW	Business
William Redmond	Field Solicitor	USDI	Business
Ray Woolford	Chief, Div. of Wildl.	BSFW	Inspection
John Wendler	Game Mgmt. Agent	BSFW	Enforcement
Ray Caudle	Sta. Manager	FAA	Business
Galen Stewart	Resident Eng.	FAA	Business
Sam Shelton	Captain, USN	Navsta, Adak	Visit
William Ferguson	Lt., J.G., USN	Navsta, Adak	Visit
Jack Quinn	Safety Officer	Navsta, Adak	Visit
Karl Kenyon	Biologist	BSFW	Visit
Otto	Writer	Germany	Visit
Paul Breed	Lt.	USCG	Business
Calvin Langford	Lt.	USCG	Business

C. Refuge Participation.

Refuge Managers Berns and Jones gave slide lectures and showed Service movies on conservation to the Cold Bay School Children and to the Air Force Dew Line Site on December 6, 10, and 23.

D. Hunting.

See under Wildlife.

E. Violations.

Two men were apprehended by Assistant Refuge Manager Berns for sport fishing without a license. They were fined $25 and $50 each and given suspended jail sentences by the deputy magistrate in Cold Bay.

F. Safety.

A general safety meeting was called by the FAA Station Manager and the Refuge staff was invited to attend. Driving and airport safety and hazards were discussed.

Refuge Managers Berns and Jones started a 92-hour-fire-fighting course at the Cold Bay Fire and Crash Station.

VII. OTHER ITEMS

A. Items of Interest.

Assistant Refuge Manager Vernon Berns and Shirley Kragh of Colorado Springs, Colorado, were united in marriage on September 16 at the 714 Dew Line Site. Refuge Manager Robert Jones acted as best man. During the ceremony Mr. Jones presented goose bands rather than the gold wedding bands to the groom.

Mrs. Berns and several of the Cold Bay youngsters participated in banding eiders this fall. Their efforts and cooperation were appreciated.

Refuge Manager Jones departed for Adak on December 15 to modify the new dory and make preparations for the sea otter project on Amchitka. During his stay on Adak he plans a trip to the Caribou Peninsula to photograph the 1958 and 1959 caribou transplant.

Submitted by: _____
Robert D. Jones, Refuge Manager &
Vernon D. Berns, Asst. Refuge Manager

March 5, 1962

Approved by: _____
David L. Spencer
Regional Refuge Supervisor

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
Juneau, Alaska

Refuge Aleutian Islands National Wildlife Refuge Calendar Year 1961

Facilities

Picnic areas: areas none tables none fireplaces none toilets none

drinking water none shelters none

Swimming: designated areas none bathhouses none

Boating: launching sites none rental facilities none

service facilities none

are motors allowed yes maximum horsepower

Camping: permitted yes or not permitted

tent camps none total capacity

group camps none total capacity

hunter camps none total capacity

trailer camps none

lodges none capacity

cabins none motels none total units

Tours: season none frequency

self-guided nature trails - is trail leaflet available? no

self-guided auto tour route - is tour leaflet available? no

Access points: estimate number in public use

General - Brief statement of two to five lines on recreational opportunities available on refuge (suitable for inclusion in refuge leaflets or briefing reports).

INSTRUCTIONS

Supply numbers wherever appropriate. These may be estimated if necessary.

Where operation and maintenance is supervised by this Bureau, but the responsibility of a concessioner, group, or agency, indicate by a single *. Where supervision of such activities is by another Federal Bureau indicate by two **.

The main mode of travel to this refuge is by Air, which is very expensive, therefore the refuge has very few visitors.

The Adak Naval Station at Adak, has set up a recreational facility on Lake Andrews with a number of small boats which are maintained by the Navy. Brown bear hunting is allowed on Unimak Island and hunters may set up tent camps. This is very limited because vehicles are not authorized to leave the roads and the roads are only around the DEW Line Site and the Coast Guard Station.

3-1750
Form N[illegible]
(Rev. [illegible]rch 1953)

WATERFOWL

REFUGE Aleutian Islands MONTHS OF September TO December, 19 61

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	20									
Trumpeter Whooper	100									
Geese:										
Canada lesser	5,000									
Cackling Aleutian	30									
Brant	10,000									
White-fronted										
Snow										
Blue										
Other Emperor	300,000									
Ducks:										
Mallard	50,000									
Black										
Gadwall	1,000									
Baldpate										
Pintail	25,000									
Green-winged teal	500									
Blue-winged Common	100,000									
Cinnamon teal										
Shoveler	100									
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup	20,000									
Goldeneye	20,000									
Bufflehead	20,000									
Ruddy										
Other King eider	200,000									
Common eider	5,000									
Harlequin	1,000,000									
Old Squaw	1,000,000									
European widgeon	100									
Tufted duck	50									
Coot:										

Int. Dup. Sec.,

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Aleutian Islands Months of September to December 1961

(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:										
Pelagic cormorants			Slender-billed shearwaters							
Red-faced cormorants			Sooty shearwaters							
Tufted puffins			Fulmars							
Horned puffins			Forked-tailed petrels							
Least auklets			Leach's petrel							
Whiskered auklets			Laysan albatross							
Crested auklets			Black-footed albatross							
Parakeet auklets										
Ancient murrelets										
Pigeon guillemots										
Common loon			We do not attempt to assign numbers to these pelagic birds.							
Arctic loon										
Red-throated loon										
Common murre										
Thick-billed murre										
II. Shorebirds, Gulls and Terns:										
Glaucous-winged gull										
Sabine's gull										
Black-legged kittywake										
Parasitic jaeger										
Black oystercatcher										
Northern phalarope			These are the shorebirds we have encountered but we have							
Least sandpiper			no basis for the assignment of numbers.							
Ruddy turnstone										
Little brown crane										
Rock sandpiper										
Wandering tattler										
Lesser yellow-legs										
Bar-tailed godwit										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove					
White-winged dove					
IV. Predaceous Birds:					
Golden eagle	none				
Duck hawk	500				
Horned owl	none				
Magpie	none				
Raven	1,000				
Crow	none				
Bald eagles	1,000				
Gyrfalcon	100				
Snowy owl	500				

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O. 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 appro priate spaces. Special attention should be given to those species of local and national significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiform
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) otal: Estimated total number of the speci using the refuge during ...

(6) otal: Estimated total number of the speci using the refuge during the period concerned.

3-1752
Form N 2
(April 1946)

UPLAND GAME BIRDS

Refuge Aleutian ISLANDS Months of September to December, 19 61

(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.
Rock ptarmigan	1,800,000	Unknown	10	Unknown		Unknown			Unknown	Except on Amchitka where the population has risen following removal of the foxes the present trend is down in numbers.
Willow ptarmigan										There is an unknown number of these birds that move back and forth between Unimak I. and the Alaska Pen.

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[illegible]
Form [illegible]-3
(June 1945)

BIG G[illegible]

Refuge Aleutian Islands Calendar Year 1961

(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	
Alaska brown bear	All of Unimak I.	Unknown	1	-	-	-	Unknown			None		75	75	
Barren-ground caribou	All of Unimak I.	Unknown	None				Unknown			None		500	500	
Barren-gound caribou	14,000 acres of Adak I.	Unknown	None				One lost to entanglement in wire.			None		36	36	
Feral reindeer	All of Atka I.	Unknown	25	-	-	-	Unknown			None		2,500	2,500	

Remarks:

Reported by _____

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 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.

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

(1)

NONAGRICULTURAL COLLECTION RECEIPTS, AND PLANTINGS

Refuge Aleutian Islands Year 19 61

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	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
Zostera marina							Clam Lagoon		Few square feet Experimental	Growing plants	Aug.1	100%	

(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: _____

76148

3-1760
Form NR-10
(April . 6)

HAYING AND GRAZING

Refuge Aleutian Islands Year 19 61

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Gundersen, Chris	SUP 20711	Caton Island	4000	528	none	Jan. 1 to Dec. 31	150/yr	unknown	

Totals:

Acreage grazed..... Animal use months..... Total income Grazing.....

Acreage cut for hay..... Tons of hay cut..... Total income Haying.....

Interior--Duplicating Section, Washington, D. C.

18268

3-1750
Form N[illegible]
(Rev. [illegible]arch 1953)

WATERFOWL

REFUGE Izembek MONTHS OF September TO December, 19 61

(1) Species	(2) Weeks of reporting period: 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	50									
Trumpeter	0									
Geese:										
Canada lesser	50,000									
Cackling	10,000									
Brant	250,000									
White-fronted	100									
Snow	6									
Blue	0									
Other Emperor	50,000									
Ducks:										
Mallard	18,000									
Black										
Gadwall	1,000									
Baldpate	0									
Pintail	200,000									
Green-winged teal	15,000									
Blue-winged teal										
Cinnamon teal										
Shoveler	500									
Wood Old Squaw	50,000									
Redhead										
Ring-necked										
Canvasback										
Scaup	10,000									
Goldeneye	2,000									
Bufflehead	2,000									
Ruddy King Eider	200,000									
Other Steller's eider	40,000									
Common eider	200									
Harlequin	200									
Common scoter	200									
Coot: White-winged scoter	500									

Int. Dup. Sec.,

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Izembek Months of September to December 19 61

(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:										
Pelagic cormorant			1,500							
Common Loon			12							
II. Shorebirds, Gulls and Terns:										
Least sandpipers			75,000							
Rock sandpipers			200							
Greater yellowlegs			50							
Dowitcher			200							
Glaucous-winged gulls			5,000							
Fulmars			500							
Leach's petrel			200							
Arctic terns			200							
Sabine's gull			200							
Northern phalarope			50							

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove					
White-winged dove					
IV. Predaceous Birds:					
Golden eagle	None				
Duck hawk	25				
Horned owl	None				
Magpie	50				
Raven	300				
Crow	None				
Bald eagle	25				
Gyrfalcon	50				

Reported by.....

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.

3-1752
Form N[illegible]-2
(April [illegible]946)

UPLAND GAME BIRDS

Refuge Teshekpuk Months of September to DECEMBER, 19 61

(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.
Rock ptarmigan										This species is rare on the range. It occupies a limited alpine area and comes down only under severe snow and ice conditions. We have collected two in 14 years.
Willow ptarmigan	Heath and brushland					250	None		2,000	The present trend is to increasing numbers after a low period in the cycle.

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.

3-1753
Form 9-3
(June 1945)

BIG GAME

Refuge Isembek Calendar Year

(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	
Alaska brown bear	Heath, brushland, marsh, & alpine	Unknown	8	-	-	-	Unknown			None		100	100	
Barren-ground caribou	Heath, brushland & marsh	Unknown	5	-	-	-	Unknown			None		200	200	

Remarks:

Reported by

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 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.

3-1[illegible]
Form NR-9
(April 1946)

COLLECTIONS AND RECEI[illegible]S OF PLANTING STOCK
(Seeds, rootstocks, trees, shrubs)

Refuge Ismbok Year 1961

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period of Collection	Method	Unit Cost	Amount	Source		
Zostera marina	experimental few sq. ft.	July 31	lifting out growing plants by hand	.10	none		none	none

Interior Duplicating Section,
Washington 25, D. C. 84267