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REFUGE NARRATIVE REPORT

July 1, 1974 - June 30, 1975

ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE

AND

BOGOSLOF NATIONAL WILDLIFE REFUGE

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ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE

and

BOGOSLOF NATIONAL WILDLIFE REFUGE

U.S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Adak, Alaska

US FISH & WILDLIFE SERVICE--ALASKA
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REFUGE STAFF

Permanent

G. Vernon Byrd	Acting Refuge Manager
John L. Trapp	Biological Technician
Dorothy Ash	Administrative Clerk
Lahoma Shannon	Administrative Clerk
George A. Putney	Master/Engineer

Temporary

Christian P. Dau	Biological Technician '74
Matthew H. Dick	Biological Technician '74
Charles S. Craighead	Biological Technician '74
Kristian Anderson	Cook/Deckhand '74
John Hakala	Cook/Deckhand '74
David B. Clemens	Cook/Deckhand '75
Dennis W. Woolington	Biological Technician '75
Lawrence G. Frank	Biological Technician '75
Glenn A. Elison	Biological Technician '75
Kenneth R. Whitten	Biological Technician '75
D.H.S. Wehle	Biological Technician '75
Robert H. Day	Biological Technician '75

TABLE OF CONTENTS

I. General
   A. Weather Conditions
   B. Habitat Conditions
      1. Water
      2. Food and Cover

II. Wildlife
   A. Migratory Birds
      1. Whooper Swan
      2. Aleutian Canada Goose
      3. Emperor Goose
      4. Bean Goose
      5. Ducks
      6. Shorebirds
      7. Passerines
   B. Pelagic Birds
      1. Storm-Petrels
      2. Red-faced Cormorant
      3. Glaucous-winged Gull
      4. Aleutian Tern
      5. Ancient Murrelet
      6. Auklets
      7. Puffins
   C. Upland Game Birds
   D. Birds of Prey
   E. Mammals
      1. Arctic Fox
      2. Caribou
      3. Whale
   F. Fish
   G. Disease

III. Refuge Development and Maintenance
   A. Physical Development
      1. Field Cabin at Buldir
      2. Furniture for Residences
      3. Renovation of Residence Quarters
   B. Plantings
      1. Aquatics and Marsh Plants
      2. Trees and Shrubs
      3. Upland Herbaceous Plants
      4. Cultivated Crops

C. Collections and Receipts
   1. Seed or other Propagules
   2. Specimens
D. Control of Vegetation
E. Planned Burning
F. Fires

IV. Resource Management
A. Grazing
B. Haying
C. Fur Harvest
D. Timber Removal
E. Commercial Fishing

V. Field Investigations
A. Winter Banding of Passerine Birds
B. Food Items of Snowy Owl
C. Beach Bird Survey
D. Comparative Breeding Behavior of Two Forms of Leucosticte
E. Feeding Ecology of Horned and Tufted Puffins
F. Breeding Biology of Aleutian Tern
G. Avian Migrants in the western Aleutians
H. Distribution of Aleutian Island Avifauna
I. Distribution and Abundance of Pelagic Seabirds
J. Breeding Biology of Storm-Petrels
K. Breeding Biology of the Red-faced Cormorant
L. Aleutian Canada Goose Restoration Program
M. Arctic Fox Population Dynamics
N. Sea Otter Ecology in the Near Islands
O. Glaciation in the central Aleutians

VI. Public Relations
A. Recreational Uses
B. Visitors
C. Refuge Participation
D. Hunting
E. Violations
F. Safety

VII. Other Items
A. Credits

LIST OF TABLES

Table		Page
1.	Bald eagle age ratios at Adak, Alaska	14
2.	Prey remains of Arctic foxes on Agattu Island, 1974-1975	16
3.	Arctic fox age and sex structure	17

LIST OF FIGURES

Figure		Page
1.	Crested and least auklets resting on a boulder in the Main Talus at Buldir Island	Frontispiece
2.	Goose banding party taking a rest at Buldir	2
3.	John Sarvis, Asst. Refuge Manager at Izembek NWR, and Acting Refuge Manager Byrd measuring a gosling Aleutian Canada goose	3
4.	Banded adult Aleutian Canada goose	4
5.	Access to the islands is provided by Avon raft, here being launched from the R/V Aleutian Tern	11
6.	Preparing to launch the Avon raft on the boulder beach at Buldir	13
7.	Arctic foxes forage principally along the beaches in the Aleutians	17
8.	Cuvier's beaked whale found beached at Nizki Island	18
9.	Aleutian Canada goose goslings are susceptible to coccidiosis when kept in confined quarters	20
10.	New cabin erected at Buldir Island houses 4-6 people comfortably	21
11.	A small portion of the seabirds attracted by the fishing operations of the Japanese stern-dragger Tomi Maru No. 12. Aggregation included albatross, fulmars, gulls and kittiwakes	24

12.	Summer temporaries collect stomach contents for food habit's analysis study of puffins, and prepare study skins	26
13.	Tom and Ceil Ramsey, of TLR Productions, produced film footage of the goose banding operations at Buldir in 1975	30

I. GENERAL

A. Weather Conditions

The winter of 1974-75 was the coldest in recorded history in the Aleutian Islands, with record amounts of snowfall and below average temperatures.

B. Habitat Conditions

1. Water. Nothing to report.

2. Food and Cover. Nothing to report.

II. WILDLIFE

A. Migratory Birds

1. Whooper Swan. Whooper swans are annual winter residents in the western and central Aleutians, arriving in early November and departing by the first week of April. During the winter of 1974-75 swans arrived at Adak on 24-26 November and departed on 20 April, establishing a new late departure date for that locality.

2. Aleutian Canada Goose. The restoration project and breeding biology study of this endangered species, begun in May 1974, continued during the 1975 field season. Two biologists remained with the 41 captive-raised geese released on Agattu in 1974. Out of 16 females and 25 males in the flock, four pairs nested and two successfully raised a total of five young. The other geese remained near the release site in one group all summer, departing the island about the first week of September.

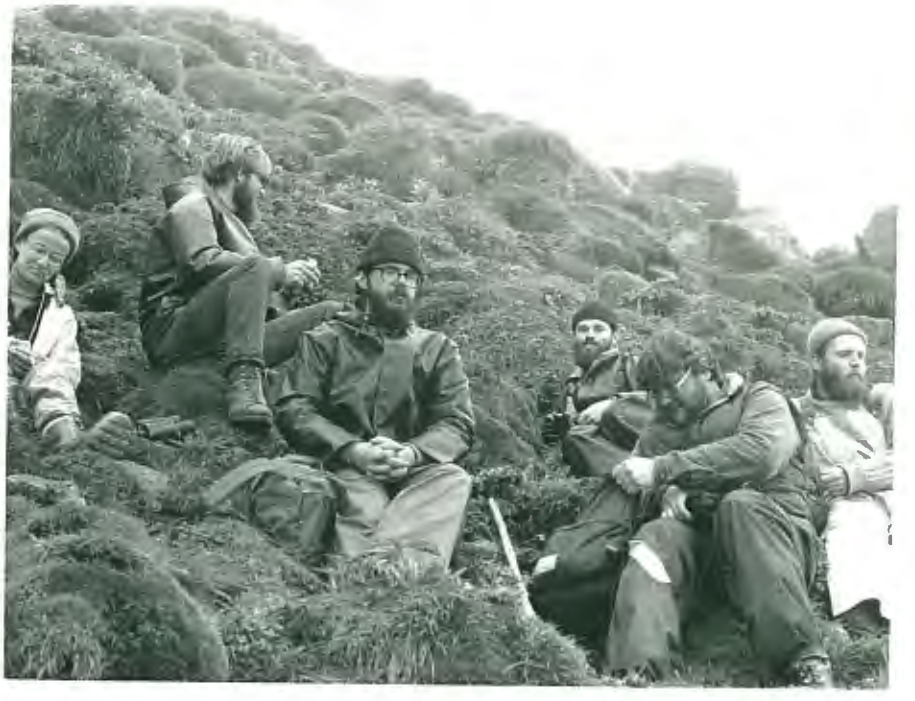

Figure 2. Goose banding party taking a rest at Buldir.

Because the released birds had never migrated before, nine geese were transported from Buldir to Agattu with the hope that the wild birds would guide the captive-raised birds to the wintering grounds. This arrangement apparently worked because during the winter of 1974-75 two of the released birds were recovered along northern coastal California and one other was identified by the white plastic leg band.

Two biologists spent the summer of 1975 on Agattu Island but did not see any geese, indicating that the birds probably did not return there. The sighting of single Aleutian Canada geese in California during the winter of 1975-76 wearing apparent white color bands suggest that some birds from the 1974 release still survive.

About 120 geese were banded at Buldir during the late summer of 1974. During the following hunting season, nine recoveries were reported from central and northwestern California. In early March 1975 a flock of Aleutian Canada geese were discovered roosting on Castle Rock, near Crescent City, California. This afforded an opportunity to census the population, which peaked at 790 birds in mid-April, 1975. As a result of refuge banding activities the location and extent of the wintering grounds was documented, and the minimum population size was determined.

Figure 3. John Sarvis, Asst. Refuge Manager at Izembek NWR, and Acting Refuge Manager Byrd measuring a gosling Aleutian Canada goose.

Biologists continued studies at Buldir during the summer of 1975 in an effort to learn more about the breeding biology and nesting ecology of this species. The average clutch size of 45 nests was 5.9 and nesting and hatching success was 89 and 73 percent, respectively. A large percentage

Figure 4. Banded adult Aleutian Canada goose.

of the nest sites used in 1976 were occupied in 1975 also. The most common plants found in the vicinity of goose nests are Elymus arenarius, Angelica lucida and Heracleum lanatus, all of which offer excellent protective cover.

Geese were again banded at Buldir during July and August, 1975, with a total of 77 birds marked. Interestingly, only 1 of the 119 birds banded in 1974 was recaptured. The difficulty of capturing Aleutian Canada geese on the steep sea slopes and in the waist-high vegetation is revealed by the information collected on banding effort. A total of 474.5 man-hours was expended in the capture of 101 geese (77 banded, 23 shipped to Patuxent Wildlife Research Center, 1 recapture), or nearly 5 man-hours of effort per goose captured.

3. Emperor Goose. The first emperor geese were noted at Adak on 29 September, but almost no birds were seen between then and mid-December. This species failed to build to its normal late winter (February and March) peak at Adak, where numbers appeared to be way down from previous years. Emperors were reported to be present in large numbers in the western Aleutians at Attu and Shemya.

4. Bean Goose. The only bean goose reported during the period was a single bird observed 1-20 June at Buldir.

5. Ducks.

Surface-feeding Ducks. The North American race of the green-winged teal (Anas crecca carolinensis) is common in the eastern Aleutians but rare in the central Aleutians, where it is replaced by A. c. nimia. The presence of a male at Buldir 19-29 May, well west of the specie's normal range, is therefore of considerable interest.

The fifth Aleutian and Alaska record of the Garganey was provided by a pair observed at Shemya Island 20-22 May by Daniel D. Gibson and Raymond S. Hadley.

European wigeons continue to show up in large numbers in the western and central Aleutians during May and June; although courtship and copulation has been observed, breeding has not

yet been documented. Birds were reported from five locations during the spring of 1975: up to 28 birds were present at Shemya in mid-May; up to 5 at Agattu 24 May to 8 June; up to 40 at Buldir in late May, rapidly diminishing to 3 birds by mid-June; 5 at Amchitka in mid-May; and a few at Adak during May.

Bay Ducks. A male common pochard appeared at Adak on 28 April to establish a new early arrival date, and up to 2 birds remained at Adak through 2 June. Up to 9 pochards, the highest count of this Eurasian species in Alaska, were observed at Shemya in May; and one was present at Buldir 7-11 June.

Tufted ducks were recorded in unusually large numbers at five locations: a maximum of 43 birds (a new high count for Alaska) at Shemya in mid-May; 1 pair at Agattu in late May; 2 pairs at Buldir in late May; 13+ birds at Amchitka in mid-May; and small numbers at Adak during May.

Sea Ducks. Harliquin duck flock sizes and sex ratios were recorded at Agattu during May and June. The mean size of 49 flocks was 5.2 birds (range 1-20; mode 2). Males were outnumbered by females (45 percent males, or 0.8 males/female; n=244), and 28 percent of the males observed were immatures. Similar data gathered at Alaid-Nizki in June revealed an average flock size of 7.8 birds (range 1-34; mode 2; n=32). Males outnumbered females here (77 percent males, or 3.4 males/female; n=115).

Common Eider flock sizes and sex ratios were recorded daily at Agattu from 21 May to 26 June 1975. The average flock size during this period was 2.8 (range 1-40; n=808). Mean flock size declined from 4.5 during the third week of May to 2.0 in late June. Also, the modal flock size was 2 through 13 June, but was 1 thereafter. This probably reflects the onset of breeding by most females in the population about this time. Males comprised 62.7 percent (1.68 males/female; n=2220) of the eiders observed during May and June. Less than 1 percent of the males observed were immatures. At Alaid-Nizki the average size of 116 flocks noted during June and July was 3.2 (range 1-18; mode 1.5), and males comprised 80 percent (4.0 males/female; n=580) of the individuals recorded.

Mergansers. Three female-plumaged smews remained at Adak as late as 27 April; and six birds, an adult male and five female-plumaged birds together, at Shemya for several days in mid-May were a new high count for the species in Alaska.

The common merganser is normally found in the central and western Aleutians during the winter months. Unusual summer records included a single male at Buldir on 28 July and four females at Agattu on 1-4 June.

6. Shorebirds. Shorebirds continue to make headlines in the western Aleutians, where the recent work of biologists reveals the apparent annual occurrence of Asiatic species rarely recorded elsewhere in North America. Seven of the 13 species discussed in the following paragraphs are not illustrated in any North American field guide.

A single Mongolian plover seen at Buldir on 19 May was the only record of the spring. Long-toed stints were present at Buldir 19-24 August, and one was collected on 3 September. Up to 10 long-toed stints were present at Shemya in mid-May, up to 3 were seen at Buldir 21-30 May, and one at Adak in mid-May provided the easternmost Aleutian record to date. A male ruff was present at Buldir on 30 August - 1 September, while one at Shemya on 14 May was the only spring record.

A lone spotted redshank was noted at Buldir on 30 August, while the first North American record and specimen of a marsh sandpiper was taken at Buldir on 2 September. A single greenshank observed at Shemya 15 May is the fourth Alaska record of the species, and one found dead at Buldir 5 June provides only the third North American specimen. A greater yellowlegs observed carefully at Shemya on 12 May was an extralimital occurrence, and only the second record for the Aleutians.

Wood sandpipers were recorded in record numbers during the spring of 1975 from Attu to Adak. The species arrived at Shemya on 13 May, on which date numerous pairs and singing birds were noted. A flock of 31 birds on the same day is the highest count known for Alaska. Up to 15 were present at Buldir 18 May - 9 June. One pair of common sandpipers was present at Shemya in mid-May, and single birds appeared at both Agattu and Buldir in late May and early June.

A single bristle-thighed curlew at Shemya in mid-May, and up to two birds at Buldir 19-28 May represent the second and third Aleutian Island records of this species. Single whimbrels (the Asiatic form, variegatus) were seen at Alaid, Agattu and Buldir. Bar-tailed godwits were recorded at Attu, Shemya, Buldir and Adak in late May and early June.

Common snipe (the Asiatic C. g. gallinago) were recorded from the Aleutians for the first time in 1974. They were again recorded during the spring of 1975, with a maximum of 18-20 individuals per day at Shemya in mid-May, and several birds at Buldir in late May. The only summer record is of a single bird noted 19 July at Agattu. The observations of birds performing courtship flights suggest that this form may nest in the westernmost Aleutians. These recent sightings add credence to reports made to Olaus J. Murie by the Attu natives in 1937 that this species occurred and nested there.

7. Passerines. A singing male skylark was observed at Shemya on 22 May, and one was seen at Attu on 7 July. These birds are A. a. pekinensis, from Asia, and should not be confused with the introduced birds in British Columbia.

A barn swallow, an example of the Asiatic H. r. gutturalis, was seen at Agattu on 3 July. This is the second occurrence of this species on Agattu in as many years.

Three white wagtails observed at Shemya in mid-May were carefully identified as M. a. lugens, the first Aleutian record of this form since 1913. Subsequently, a white wagtail observed at Adak 15-16 June was also identified as this race. Up to two white wagtails were seen at Buldir in late May and early June.

Yellow wagtails are rare migrants in the Aleutians, so the heavy migration in this area during the spring of 1975 is of particular interest (especially since the birds involved were identified as the Kamchatka form, rather than the Alaska-breeding form). The maximum count was 15, at both Amchitka (mid-May) and Buldir (18 May-8 June). Five were seen at Shemya in mid-May, and single birds were also recorded at Agattu and Adak.

A female common rose finch carefully studied at Buldir on 3 June represents the third Alaskan and North American records of this Asiatic finch.

Two male bramblings at Shemya during the third week of May were the only ones recorded during the spring of 1975, but they add cumulative evidence that this species is an annual, rare migrant in the western Aleutians.

A male common reed bunting (Emberiza schoeniclus) collected at Buldir on 29 May is the first North American record of this Asiatic bunting.

B. Pelagic Birds

1. Storm-Petrels. A breeding biology study of Leach's and fork-tailed storm petrels was begun at Buldir. A progress report on this study has been filed in the refuge office.

2. Red-faced Cormorant. The red-faced cormorant, which is the most abundant of the three cormorants nesting in the Aleutians, reaches peak densities in the Near Islands. An analysis of 117 15-minute transects conducted within the neritic waters of the Near Islands reveal that this species has an estimated density of 16.1 to 36.1 birds km^{-2}. These large densities, combined with large biomass, makes this species an important component of the marine littoral ecosystem of the Aleutian Islands. Because of its importance as an "indicator species", and the fact that almost nothing was known of its breeding biology, refuge biologists have been gathering basic information for the past several years.

Red-faced cormorants arrive at nesting colonies in the western Aleutians by late April and egg-laying commences by the first week of May. The first eggs hatch the last few days of May or the first week of June, while the peak of fledging appears to be about the first two weeks of August. Within individual colonies the stage of the breeding cycle is highly synchronized, but colonies separated by no more than one km of coastline may vary by 7-10 days in the state of the nesting cycle. The 164 nests observed at Agattu in 1974 and 1975 contained an average of 3.1 (range, 1-4) eggs.

There is evidence that red-faced cormorants may change nesting colonies from year to year. Some cliffs which held nesting cormorants in 1974 were vacant in 1975 and, vice versa, one stretch of cliffs which had no cormorants in 1974 contained large numbers of nesting birds in 1975.

Glaucous-winged gulls, common ravens, and Arctic foxes prey on the eggs and nestlings of red-faced cormorants at Agattu. Gulls are the most important nest predators on cormorants, and their effect may be amplified by human interference. We gathered information at Agattu during the summer of 1974 which indicate that the activities of biologists in the vicinity of nesting colonies may severely depress the nesting success. Of 270 nests marked in the vicinity of Aga Cove, and which were disturbed at least weekly, only 17 (6.3 percent) contained young in late July; conversely, of 89 nests noted at Cape Sabak on 4 August, and which had not been previously disturbed, (81 percent) contained 1-4 young.

3. Glaucous-winged Gull. The breeding phenology of the glaucous-winged gull was studied at Buldir during the summer of 1975. Egg laying was well underway in colonies along the North Bight Beach on 17 May, with many nests containing full clutches. The first eggs were pipping on 14 June, and by 24 June 98.8 percent of the eggs showed evidence of hatching activity. The first fledging was seen on 24 July, and nearly all young had fledged by 10 August. Interestingly, this schedule is in general agreement with less reliable data gathered at Agattu Island in 1974 and 1975, but the fledging dates are up to two weeks earlier than those observed in colonies at higher elevations on Buldir. The clutches of 59 nests studied at Buldir was distributed as follows: one egg, 1; two eggs, 2; three eggs, 55; 4 eggs, 1.

The food habits of glaucous-winged gulls were studied at Buldir and Agattu Islands during the summers of 1974 and 1975 by analyzing regurgitated pellets. At Buldir (n=392) the diet consisted of fork-tailed and Leach's storm-petrels (29.1 and 23.2 percent, respectively), fish (23.5 percent), ancient murrelets (11.2 percent), sea lion fur (6.4 percent) and Aethia auklets (5.9 percent). The carcasses of dead sea lion pups were fed on heavily after late July and kelp flies became an important part of the diet in late August and early September of both years. Crowberries were an important part of the diet in the fall of 1974, but were rarely eaten during the fall of 1975, probably because of a poor berry crop.

At Aggatu Island, where petrels, murrelets, and auklets occur in only limited numbers, the summer diet was composed largely

of marine invertebrates gathered from the intertidal zone. The principal remains found (n=162) included: sea urchin (42.4 percent), pebbles (27.6 percent), chitons (9.6 percent), and blue mussels (6.8 percent). Gulls were observed feeding on sea lion excreta during May and June; the carcasses of dead sea lions were probably also fed upon. Although not reflected in the pellet analysis, large numbers of red-faced cormorant eggs and chicks are taken in May, June and early July. As at Buldir, crowberries were utilized heavily during the fall of 1974.

Figure 5. Access to the islands is provided by Avon raft, here being launched from the R/V Aleutian Tern.

4. Aleutian Tern. The Aleutian tern is decidedly uncommon and localized in the Aleutians, despite its common name, and has been recorded breeding at only five widely scattered locations in the Chain (Unimak, Umnak, Adak, Amchitka and Attu). Fifty to sixty pairs nested at Attu during the summer of 1975, providing an opportunity for temporary Biological Technician Eric P. Hoberg to gather breeding biology information. Terns were first observed in the vicinity of the colony on 27 May; courtship activities began the following day and continued through early June. Egg laying occurred during the first ten days of June. The 34 marked nests contained an average of 1.6 eggs (range 1-2). Twenty-three nests were successful, 8 were abandoned for unknown reasons, and 3 could not be relocated.

5. Ancient Murrelet. This nocturnal, burrow-nesting alcid breeds at Buldir in large numbers. Ancient murrelets are perhaps most noted for the mass migrations made by the precocial downy young from the nesting chamber to the sea at only a few days of age. The nesting cycle of the ancient murrelet is highly synchronized and the mass migrations of downy young occur on only a few days during the summer. At Buldir in 1974 downy ancients were seen nightly from 10 through 27 July, with the peak movement occurring on 17 July. In 1975 the migration extended over a longer period of time. Downies were seen from 7 July through 9 August, but the magnitude of the nightly migrations tapered off rapidly after mid-July. The peak movement occurred during the period 11-14 July. Because of the ease with which adults and downy young may be captured during the nightly migrations, refuge biologists conducted a banding program during 1974 and 1975. A total of 208 ancient murrelets have been banded, including 69 adults and 139 downies. One of the 4 adults banded in 1974 was recaptured in 1975. The downy young weighed an average of 27.9 g (range 24-33, n=128) at the time of the mass exodus.

6. Auklets. Four of the six auklets species found in the Aleutians breed among the boulder-strewn talus slopes of Buldir and the other two may do so. Parakeet, crested, least and whiskered auklets all nest in varying densities, and the regular occurrence of Cassin's auklets in small numbers suggests breeding by that species also. Single rhinocerous auklets at Buldir on 7, 18 and 24 July (1975) are the only records of this

species anywhere in the Aleutians in recent years, although Clark (1910. Proc. U.S. Natl. Mus. 38:25-74) mentions seeing small numbers of this species at Atka and Agattu in 1906. Limited mist-net work at Buldir in 1974 and 1975 resulted in the capture and banding of 443 auklets distributed by species as follows: least, 294; crested, 141; whiskered, 5; parakeet, 2; and Cassin's, 1. Five of the 34 least auklets captured in 1975 were recaptures of the 265 individuals banded in 1974.

Figure 6. Preparing to launch the Avon raft on the boulder beach at Buldir.

C. Upland Game Birds

The willow ptarmigan occurs only in the eastern Aleutians, while the rock ptarmigan (with eight recognizable subspecies) is found on each of the major islands, or island groups. Ptarmigan hunting is an important recreational pursuit on the refuge, most of it occurring at Adak. During the course of the 8 1/2 month open season (August 10 - April 30) ptarmigan hunting accounts for an estimated 490 hunter visits and 1,960 activity hours of recreation on the refuge.

D. Birds of Prey

Bald eagles concentrate in large numbers in the vicinity of the U.S. Naval Station, Adak during the winter months. The winter population, attracted by readily available refuse at several open garbage dumps, has been estimated to exceed 300 birds. Counts conducted at this season indicate that immature birds (1- to 4-year olds) constitute about two-thirds of the population (Table 1). This is a much higher immature:adult ratio than recorded elsewhere in North America and is indicative of a high reproductive success in this population. It probably also reflects, in part, a dependence of the inexperienced younger birds on the garbage dumps for food.

Table 1

BALD EAGLE AGE RATIOS AT ADAK, ALASKA

Date	Immatures	Adults	Total	Present Immature
Dec. 17, 1972[a]	102	39	141	72.3
Dec. 15, 1973[a]	173	92	265	65.3
Fall 1974[b]	151	77	228	66.2
Dec. 28, 1974[a]	86	57	143	60.1
Fall 1975[c]	208	100	308	67.5
Dec. 20, 1975[a]	198	102	300	66.0

[a]Christmas bird count
[b]Cumulative data from 5 counts conducted 8-30 November 1974
[c]Cumulative data from 19 counts conducted 15 October - 7 December 1975

E. Mammals

1. Arctic Fox. The blue phase of the Arctic fox is indigenous only to Attu in the Aleutian Islands, but by 1930 it had been introduced to most of the more than 200 islands in the Chain. The foxes were introduced for the purpose of starting a commercial fur farming industry. A few pairs of foxes were released on each island; they would feed on the abundant seabird resource and multiply, and a few years later the trappers returned to harvest the surplus at a lucrative profit. The advent of WWII and a decline in fur prices brought an end to fur farming in the late 1940's, but the foxes still remained on most of the islands.

There is little doubt that foxes have had a detrimental effect on waterfowl and seabird populations wherever they were introduced. Although there is little quantitative data available on the effects of the introduced foxes on the native bird populations, there is strong circumstantial evidence that foxes have reduced populations of storm-petrels, ancient murrelets, Cassin's auklets, whiskered auklets and Aleutian Canada geese on various islands. It is certainly more than mere coincidence that Buldir, the only remaining breeding location of the now endangered Aleutian Canada goose, was one of the few islands on which foxes were not introduced. Murie (1959, N. Am. Fauna 61) fully documented the important part which birds play in the summer diet of the Arctic fox. Further information gathered by refuge biologists at Agattu indicate that the few foxes remaining there are preying heavily on native birds (Table 2). Burrow-nesting storm-petrels are especially susceptible to fox predation. At a Leach's storm-petrel colony on the tip of Cape Sabak (the only storm-petrel colony located in two years of searching) the remains of 34 birds were found where they had been dug out of burrows by foxes. No intact burrows were found in spite of intensive searching.

As part of the effort to reestablish Aleutian Canada geese on selected islands in the Western Aleutians, fox control work is being conducted on Agattu and Alaid-Nizki. Foxes must necessarily be eliminated from these islands before geese can be successfully re-introduced. Agattu Island was thought to be fox-free, following control efforts there in the 1960's, but small numbers were discovered there in the spring of 1974. Biologists killed 17 foxes that summer in an effort to protect the 41 captive-raised geese released there. Two hunter-biologists spent the summer of 1975 on Agattu systematically searching the

coastline for foxes and fox sign. They killed a total of 37 foxes by means of hunting and trapping and located 17 active den sites. The population at the end of the summer was estimated at 10-20 animals.

Initial survey work on Alaid-Nizki indicated that Alaid supported a very large fox population while Nizki had a moderate one. Subsequent control efforts (hunting and trapping) that summer resulted in the removal of 113 foxes from Alaid and 17 from Nizki. Thirty-four dens were located on Alaid and five on Nizki. The post-summer fox population was estimated at 5-10 animals on Alaid and 10-30 animals on Nizki.

Table 2

PREY REMAINS OF ARCTIC FOXES ON AGATTU ISLAND, 1974-1975

Species	Number	Percent
Northern Fulmar	1	0.3
Fork-tailed Storm-Petrel	122	32.8
Leach's Storm-Petrel	105	28.2
Cormorant sp.	8	2.2
Red-faced Cormorant	6	1.6
Emperor Goose	1	0.3
Pintail	3	0.8
Greater Scaup	2	0.5
Common Eider	2	0.5
Parasitic Jaeger	1	0.3
Glaucous-winged Gull	1	0.3
Blacked-legged Kittiwake	7	1.9
Murre sp.	4	1.1
Pigeon Guillemot	4	1.1
Ancient Murrelet	45	12.1
Crested Auklet	1	0.3
Least Auklet	1	0.3
Aethia sp.	2	0.5
Horned Puffin	1	0.3
Tufted Puffin	44	11.8
Song Sparrow	1	0.3
Bird eggs	10	2.7
Totals	372	100.2

Table 3

ARCTIC FOX AGE AND SEX STRUCTURE

Location	Year	Adults		Immatures			Total
		Male	Female	Male	Female	Unknown	
Agattu	1974	7	5	2	2	1	17
Agattu	1975	16	16	2	3	0	37
Alaid	1975	24	30	31	26	0	113[a]
Nizki	1975	2	6	3	6	0	17

[a]Includes two adults for which no biological data was gathered

Figure 7. Arctic foxes forage principally along the beaches in the Aleutians.

2. Caribou. Ninety-three caribou were harvested by hunters at Adak during the 1974-75 season.

3. Whales. A Cuvier's beaked whale (Ziphius cavirostris), found beached on Nizki Island in late June, was identified from photographs by scientists at the National Museum of Natural History.

Figure 8. Cuvier's beaked whale found beached at Nizki Island.

F. Fish

Edouard J. Crateau, Fishery Management Biologist from the Kenai office, visited Adak during June and August, 1975. During his visits he surveyed two lakes to assess the effect of experimental rainbow trout plants made last year. The survey revealed only limited success in Smith Pond and no survival in White Alice Reservoir. Dolly varden reduced prior to stocking of rainbow fingerlings had repopulated the reservoir. In August, Smith Pond was restocked with 3,000 rainbow trout fingerlings and North Lake received an initial stocking of 2,000 rainbow trout. Crateau also met with Adak Sportmen's Club members to discuss fishery potential on the island.

G. Disease

Twenty-three Aleutian Canada goose goslings were captured at Buldir during August, 1975 for shipment to the Patuxent Wildlife Research Center. The goslings were needed to bolster Patuxent's breeding flock.

Due to the difficulties encountered in capturing goslings and logistics problems, many of the goslings captured had to be held in 1 x 3 x 4' poultry crates for up to 7 days before enough birds had been captured for shipment to Patuxent. Three birds died at Buldir, and shortly after the arrival of the remaining 20 birds at Patuxent listless birds were noted and birds began dying. Biologists at Patuxent determined the problem to be internal bleeding caused by severe infestation of coccidia. A total of 9 geese died before the disease was brought under control.

Subsequently, goose droppings were collected at 10 widely scattered locations on Buldir, preserved in 10 percent Formalin, and shipped to the Patuxent Wildlife Research Center. Analysis of the droppings by Patuxent scientists revealed the presence of coccidia in 8 of the 10 samples. These results indicate that coccidia are widespread in the wild population, but that under normal conditions these protozoan are not detrimental to Aleutian Canada geese.

Figure 9. Aleutian Canada goose goslings are susceptible to coccidiosis when kept in confined quarters.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Field Cabin at Buldir. A 16 x 20' pre-fabricated cabin, built by the United Services Corporation at Adak for $1,500, was transported to Buldir Island aboard the R/V Aleutian Tern. There it was floated ashore in 4 x 8' sections. Considerable effort was expended in hauling the sections through the pounding surf and carrying them over the 1/4 mile stretch of boulder beach to the Main Camp. The cabin was erected in a little over one and one-half days. The completed cabin provided warm and comfortable, albeit somewhat crowded, living accomodations for 4-6 people. Everyone agreed that it was a vast improvement over spending a summer living in a tent! The cabin will be destroyed at the completion of the Aleutian Canada goose restoration project.

Figure 10. New cabin erected at Buldir Island houses 4-6 people comfortably.

2. Furniture for Residences. At the end of FY-75, $20,000 was appropriated for the purchase of new furniture for the three refuge residence units at Adak. The appropriation was lost in a shuffle of papers in the Portland office, the furniture was never ordered, and the money lost forever.

3. Renovation of Residence Quarters. Funds have been appropriated, and bids solicited, for the remodeling of three trailer units at Adak for residence units. Construction on these units has not yet begun as of the end of Fiscal Year 1975.

B. Plantings

1. Aquatics and Marsh Plants. None.

2. Trees and Shrubs. The U.S. Naval Station Adak planted about 2,000 individual trees of various species at eight designated locations on the island during the fall of 1975. The planting is designed as a beautification and morale boosting project and is part of the Navy's Bicentennial celebration efforts. Refuge personnel prepared an Environmental Assessment of the project and a Negative Declaration was issued. The Aleutian climate is not amenable to tree growth and previous plantings have resulted in stunted trees and little more than bare survival.

3. Upland Herbaceous Plants. None.

4. Cultivated Crops. None.

C. Collections and Receipts

1. Seed or other Propagules. None.

2. Specimens. Two hundred and ninety specimens (skins and eggs) of 38 species of birds were donated to various scientific institutions during CY-75.

D. Control of Vegetation

Not practiced on this refuge.

E. Planned Burning

Not practiced on this refuge.

F. Fires

None witnessed or reported.

IV. RESOURCE MANAGEMENT

A. Grazing

About 100 head of cattle are grazed on Caton Island, in the extreme eastern Aleutians, and the U.S. Navy pastures about 11 horses on Adak Island.

B. Haying

None.

C. Fur Harvest

None.

D. Timber Removal

None.

E. Commercial Fishing

There has been a commercial king crab fishery in the waters near Adak and Atka Islands for several years. Catcher boats deliver their catch to large processor ships docked at Finger Bay, Adak. The 1974-75 season was a dissappointment in the central Aleutians. Processors and fishermen were unable to agree on a market price, and the few boats that did try to fish were unable to locate sizeable numbers of crab. As a result there was no commercial harvest of king crab at Adak this year.

Figure 11. A small portion of the seabirds attracted by the fishing operations of the Japanese stern-dragger Tomi Maru No. 12. Aggregation included albatross, fulmars, gulls and kittiwakes.

V. FIELD INVESTIGATIONS

A. Winter Banding of Passerine Birds

Gray-crowned rosy finches and snow buntings were banded at Adak for the third year. A total of 67 rosy finches and 99 snow buntings were banded. Many birds banded in previous years were also banded. This is an ongoing study which will appear as a series of publications on sex and age structure, survivorship, weight variation and mensural characters.

B. Food Items of Snowy Owl

Laurence G. Frank, temporary biological technician, collected about 150 snowy owl pellets at Agattu Island during the summer of 1975. The diet of snowy owls at Agattu is particularly interesting because it is one of the few places where this owl occurs regularly in the absence of a microtine prey population. The pellets will be analyzed and the results published in a scientific journal.

C. Beach Bird Survey

Beach bird surveys were initiated at Adak in 1973 with the aid of volunteer help of Navy conservation agents. The objective of this study is to provide baseline data on the magnitude of natural die-off of marine birds and mammals in the central Aleutians.

D. Comparative Breeding Behavior of Two Forms of Leucosticte

This study on the breeding ethology of the gray-crowned rosy finch which was begun in May 1974 by Daniel F. Shreeve, graduate student from Cornell University, was terminated in June 1975. In addition to studying the breeding ethology of this form, Mr. Shreeve gathered information on winter distribution, survival, weight variation, plumage criteria and feeding habits. This data will form the basis for a Ph.D. thesis.

E. Feeding Ecology of Horned and Tufted Puffins

Mr. D.H.S. Wehle, graduate student at the University of Alaska, studied the comparative feeding habits of horned and tufted puffins at Buldir Island during the summer of 1975. These two species nest sympatrically through about half of their breeding ranges. The purpose of this study was to define and analyze those mechanisms which determine niche specificity relative to feeding ecology of horned and tufted puffins. This study will be published as a MS thesis.

Figure 12. Summer temporaries collect stomach contents for food habit's analysis study of puffins, and prepare study skins.

F. Breeding Biology of Aleutian Tern

Eric P. Hoberg, temporary biological technician, located, marked and studied the nests of 35 Aleutian terns at a colony on Attu Island during the summer of 1975. Little has been published concerning the nesting habits of this species, and the information gathered in this study will be analyzed and published in a scientific journal.

G. Avian Migrants in Western Aleutians

During the month of May 1974, Daniel D. Gibson and Raymond Hadley, ornithologists from the University of Alaska, studied the passage of migrants on Shemya Island in the western Aleutians. The western Aleutians are visited annually by numerous species of Palearctic migrants not found elsewhere in North America. This study will greatly increase our knowledge of the avifauna of the western Aleutian Islands.

H. Distribution of Aleutian Island Avifauna

This study involves the routine gathering and compilation of all sight and specimen records of birds in the Aleutian Islands. This is an ongoing project which will eventually result in the publication of a monograph on the birds of the Aleutians.

I. Distribution and Abundance of Pelagic Seabirds

Seabirds are one of the most important resources of the Aleutian Islands, but little is known concerning their pelagic distribution and abundance. Trapp made pelagic observations along the Chain during the fall of 1974, and Hoberg conducted similar observations during the summer of 1975, primarily in the western Aleutians. The information gathered is being submitted to the OCS data bank.

J. Breeding Biology of Storm-Petrels

G. Vernon Byrd studied the breeding biology of Leach's and fork-tailed storm-petrels at Buldir Island for the second

year. This investigation is designed to compare the nesting phenology and breeding strategies of these two sympatrically breeding storm-petrels.

K. Breeding Biology of the Red-faced Cormorant

The red-faced cormorant is an abundant breeding species throughout the Aleutian Islands, but its breeding biology has not been studied in detail. Trapp gathered information at Agattu for the second year. Data gathered included nesting phenology, colony synchronization, clutch size, breeding distribution and predation.

L. Aleutian Canada Goose Restoration Program

This project to restore the endangered Aleutian Canada goose to a non-endangered status has three main segments: a) study of the wild population on Buldir Island to gather basic information on nesting requirements and reproductive biology; b) preparation of suitable habitat for introducing geese; c) holding birds raised at production centers, releasing them to the wild, and studying released birds.

M. Arctic Fox Population Dynamics

This study, being conducted on Agattu, Alaid and Nizki Islands, is designed to document the size of the Arctic fox population on those islands, and to determine such population parameters as size, age and sex ratios, and birth rate.

N. Sea Otter Ecology in the Near Islands

This study will determine the importance of sea otters in the marine littoral ecosystem. Preliminary studies were conducted by James Estes, Research Division, Anchorage, during the summer of 1975.

O. Glaciation in the Central Aleutians

Study is being conducted by Dr. Robert F. Black, University of Connecticut, at Adak Island. Preliminary investigations were conducted during the summer of 1975.

VI. PUBLIC RELATIONS

A. Recreational Uses

The annual occurrence of rare and unusual bird species in the Aleutians, many of them Asiatic visitors found nowhere else in North America, has generated great interest and excitement among the birding community nationwide. The refuge is receiving increasing correspondence from private individuals and tour groups interested in visiting the Aleutians to view the unique bird life. Unfortunately, most requests have to be turned down because of a lack of civilian facilities. Bird tours have visited Adak in the past, but the Naval Station policy now is to deny all requests because of a shortage of living quarters. Shemya is closed to visitors because of security restrictions imposed by the Air Force Base, and Attu Island's Coast Guard Loran Station has no facilities to house visitors.

B. Visitors

Name	Organization
George E. Hall	USFWS, Research Division
Robert F. Black	Univ. of Connecticut
Edward Clebsh	Univ. of Tennessee
Clifford Amundson	Univ. of Tennessee
Daniel D. Gibson	Univ. of Alaska
Raymond S. Hadley	Univ. of Alaska
Tom and Ceilia Ramsey	TCR Productions
Bruno Frolich	Univ. of Connecticut
Ted Banks and Company	Western Michigan Univ.
David L. Spencer	USFWS, Area Refuge Supervisor
Hokkoido University	
James Estes	USFWS, Research Division
Robert Nelson	ADF&G
Paul Tate	ADF&G
Ed Crateau	USFWS, Fishery Services
Jon Nelson	USFWS, Fishery Services

C. Refuge Participation

Acting Refuge Manager Byrd serves as the Recovery Team Leader for the Aleutian Canada Goose Recovery Team.

Acting Refuge Manager Byrd serves as co-editor of the Alaska region column in American Birds and all significant bird observations are included in that publication.

Christmas Bird Counts are conducted at Adak annually.

Biological Technician Trapp appeared on a local Adak TV interview program to discuss the refuge and current projects and activities.

Figure 13. Tom and Ceil Ramsey, of TLR Productions, produced film footage of the goose banding operations at Buldir in 1975.

Numerous slide shows were presented to private clubs and organizations at Adak. These dealt primarily with the Aleutian Canada goose recovery project.

D. Hunting

Most of the hunting on the refuge occurs at Adak, where there are open seasons on waterfowl, ptarmigan and caribou. Military personnel are not allowed to hunt on Shemya, and only limited hunting is done at Attu. Substantial subsistance hunting is done by the Attu natives. All forms of hunting account for about 7 percent of refuge visits and 15 percent of the activity hours.

E. Violations

Three caribou hunting apprehensions were made by Trapp. The cases were turned over to the State for prosecution.

F. Safety

No lost-time accidents occurred during FY 75.

VII. OTHER ITEMS

A. Credits

The entire report was written by John L. Trapp and typed and assembled by Lahoma Shannon and Portia Odell.

Submitted by: John L. Martin
John L. Martin
Refuge Manager

Date: 7/15/76

Approved by: Warren L Clement
acting Refuge Supervisor