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BULDIR ISLAND EXPEDITION

1-22 July 1963

by

Karl W. Kenyon

**Bureau of Sport Fisheries & Wildlife
Branch of Wildlife Research
Marine Mammal Biological Laboratory
Seattle, Washington**

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PURPOSE

The purpose of the Fish and Wildlife expedition to Buldir Island was to obtain goslings of the Aleutian Canada Goose for propagation in captivity. The entire breeding population of this species, once abundant in the western Aleutians, may now be limited to Buldir Island. My purpose was to obtain photographs and material concerning the expedition for public information use. Also it was my aim to obtain information on marine mammals, particularly the sea otter.

RESULTS

Eighteen goslings of the Aleutian Canada Goose were obtained on Buldir Island. They were successfully transported by air to Denver, Colorado (for eventual transfer to Monte Vista Refuge, Colorado) by Erv. Boeker, where they arrived on 22 July. Over 500 color (35 mm) and black and white photographic exposures (120 size) were obtained showing all phases of the expedition. Observations of wildlife on Buldir were recorded for 32 species of birds and 3 species of marine mammals.

Peden, using rotenone and nets, collected a number of fish specimens from shallow water among shore rocks. Several are new distributional records. Ichthyological material from the Aleutians is now being intensively studied by Dr. Norman J. Wilimovsky, Director, Institute of Fisheries at the University of British Columbia. He expects to publish "Fishes of Alaska."

Observations obtainable during the 13 days spent on Buldir were less complete than desired because of adverse weather conditions. Wind, heavy fog, and rain curtailed activities (Fig. 2) to some extent on all but 2 days that we were on the island.

ITINERARY

1963

1 July	Leave Seattle, Washington Arrive Anchorage, Alaska	8:10 p. m. 8:00 p. m.
2 July	Anchorage--discussing walrus studies with Dr. Francis Fay	
3 July	Leave Anchorage, Alaska via RAA Arrive Adak Naval Station	9:15 a. m. 3:10 p. m.
4-5 July	At Adak preparing gear and supplies for Buldir Island Aleutian Canada Goose expedition	
6 July	Leave Adak aboard U. S. Coast Guard Cutter CLOVER	8:20 a. m.
7 July	Arrive Buldir Island	3:40 p. m.
7-19 July	On Buldir Island doing photographic and narrative coverage of Aleutian Canada Goose expedition	
19 July	Leave Buldir Island aboard USCGC KLAMATH	10:30 a. m.
20 July	Arrive Adak Naval Station	8:00 a. m.
21 July	Leave Adak via Federal Aviation Agency plane Arrive Anchorage Leave Anchorage via PNA	11:20 a. m. 4:20 p. m. 10:35 p. m.
22 July	Arrive Seattle, Washington	4:20 a. m.

EXPEDITION MEMBERS

(See Fig. 1)

Vernon D. Berns, Assistant Refuge Manager

Erwin (Erv.) L. Boeker, Research Biologist (Pilot-birds)

Robert D. Jones, Refuge Manager

Karl W. Kenyon, Research Biologist (Wildlife)

Alexander E. Peden, Graduate Student, Institute of Fisheries,
University of British Columbia

Milsted (Mil.) Zhan, U. S. Game Management Agent

COOPERATION

Fish and Wildlife Service personnel of the Branch of Wildlife Refuges (Jones and Berns), Management and Enforcement (Zhan), and Wildlife Research (Boeker and Kenyon) worked cooperatively to capture and care for the goslings.

The U. S. Naval Station at Adak, under the command of Captain Jack Roberts, furnished living quarters, working space, and the privilege of using sources of equipment and supply to fulfill our needs.

The U. S. Coast Guard furnished transportation to Buldir from Adak aboard the Buoy Tender, USCGC CLOVER, under the command of LCDR A. H. Clough. Return from Buldir to Adak was furnished by the USCGC KLAMATH under the command of Capt. J. G. Bastow.

Personnel of three airlines, Reeve Aleutian, Pacific Northern, and United, extended every courtesy to us. Personnel of the Federal Aviation Agency furnished aerial transportation for Boeker and Kenyon (as well as the goslings) from Adak to Anchorage when commercial transportation was not available.

An excellent spirit of cooperation was demonstrated by all personnel, including ships' officers and crews, who participated in this operation.

GENERAL INFORMATION

Buldir Island is located at 52°22' N. and 175°55' E. The nearest neighboring islands are Shemya and Kiska, respectively, about 75 miles to the west and east. Buldir is 4 nautical miles long from Northwest Point to East Cape and about 2 1/4 miles in greatest width. A beach about one-third of a mile long and composed of fine gray sand and cobbles is on the north shore

near Northwest Point. It offers an excellent landing except during northerly winds. The flat valley floor extending inland for about one-third mile from the beach is traversed by a continually flowing stream which furnishes a clear water supply (Fig. 3). From this, the only flat coastal area, the island slopes rise in a sequence of steep hills to a maximum altitude of 2,037 feet. Nine additional peaks are over 1,000 feet high. The island is a "practically undissected volcano" having "not been deeply glaciated or dissected by streams" (Coates, 1956).

The only lake on Buldir is about 1,000 feet long by 500 feet wide and rests in a crater about 800 feet above sea level. It is approximately 1 mile east of the camp site.

The most notable feature of Buldir is that it has suffered comparatively little from human disturbance. Foxes and rats are absent. The only obvious remnants of human presence are a few boards, several rusting oil drums and wheel tracks on the west side of the valley described above. These remnants would indicate that a small group of men were on the island for a short period during World War II. Near the old camp lies a wrecked P-38 aircraft (Bureau No. 4267638).

As noted in the annotated list of species observed, petrels, certain auklets, puffins, kittiwakes, gulls, and the Steller sea lion were present in large numbers. On the other hand, some species which breed on other Aleutian Islands were absent. Among those species that might be expected on Buldir but were not seen are: Common Raven, Fulmar, Black Oystercatcher, Rock Sandpiper (in fact, no shore birds were seen), and Arctic Tern.

ANNOTATED LIST OF SPECIES OBSERVED

(32 species of birds and 3 marine mammals were observed at Buldir Island.)

Diomedea nigripes. Black-footed Albatross. On 6 July 1963, we saw one in flight 5 miles southeast of Gareloi Island. On 7 July, we saw two in flight, wind 10 knots, 10 miles northwest of Kiska Island. On 19 July, we saw two in flight at approximately $52^{\circ}12'$, $178^{\circ}59'$.

Fulmarus glacialis. Fulmar. None was seen near shore or on the cliffs at Buldir Island. On 6 July 1963, south of Kanaga about 5 miles, we saw one in the gray phase, and near Gareloi Island they were numerous. Gray-phase outnumbered white-phase by approximately 10 to 1.

Puffinus tenuirostris. Slender-billed Shearwater. On 6 July 1963, while cruising from Adak to Gareloi Island, we saw them occasionally; about 5 miles southeast of Gareloi we saw approximately 100.

Oceanodroma furcata. Fork-tailed Petrel. On 6 July, between Adak and Gareloi, we saw a few scattered individuals. On 7 July we saw similar numbers north of Kiska. On Buldir Island they nested in large numbers in holes they had excavated in soft earth under vegetation. During the night they often flew against our tent and we heard numbers of them calling during all hours of total darkness. Several were captured (and then liberated) using a flashlight to blind the birds at night.

Oceanodroma leucorhoa. Leach's Petrel. We saw scattered individuals on the trip between Adak and Buldir Island. On Buldir we saw many nesting burrows under vegetation, and with the preceding species they swarmed about our tent at night. On the evening of 15 July at twilight, between 11 and 11:30 p. m., I saw approximately 10 petrels head out to sea but none had come in when observations were terminated because it was almost too dark to see them by then.

Phalacrocorax pelagicus. Pelagic Cormorant. This

species was not numerous at Buldir. We often saw three or four, however, perched on large boulders along the shore. Three or four pairs nested on the cliffs at Northwest Point.

Phalacrocorax urile. Red-faced Cormorant. At least

one pair nested on the cliff at the tip of Northwest Point. Three or four additional birds were seen flying to the cliff.

Branta canadensis. Aleutian Canada Goose. During

our stay I saw or heard only about six or eight geese flying over our camp area. On 11 July we hiked to a crater-like lake 800 feet above sea level and surrounded by hills. We counted 120 adult birds which remained in a loose flock on the water, probably some of these were flightless (Figs. 4 and 5). Seven of these birds, plus five goslings, left the water at the north end of the lake and ran up a slope. We chased them and succeeded in catching the five goslings (Figs. 6 and 7). About a dozen of the other birds took flight, but others remained on the far side of the lake from us.

During our hike on 11 July from sea level to the lake, we flushed six geese at about the 400 to 500 foot level. Droppings were numerous in the vegetation (primarily rye grass and wild celery) and near a small tundra pond about 15 feet in diameter (Figs. 8 and 9).

On 12 July we explored a plateau at an altitude of about 250 feet near Northwest Point. The herbaceous vegetation and grass in this area is about waist high. This is the area where in 1962 Jones and Berns found a brood of goslings. We flushed a pair of adults but failed to find any goslings.

On 13 July Jones took the dory to a beach about 2 miles east of our camp area. Here several flightless adults and two broods of goslings were found. On 16 July I explored an area about 1/2 mile east of camp where on 14 July we had captured two broods. The area is one of steep rock slides which extend down the mountainside for about 200 to 300 feet from the base of perpendicular escarpments. On a rock slide adjacent to the slide where the two broods were captured I spotted a pair of adults and these soon led their brood of five over a small ridge and across a steep rubble slide to a vegetation-covered bench. Here I was able to obtain photographs of the brood (Fig. 10).

The total number of goslings seen is listed below:

<u>Date</u>	<u>Broods</u>	<u>No. of young</u>	<u>Remarks</u>
9 July	?	2	Two dead young on beach at base of steep slope.
11 July	1	5	All captured.
13 "	1	2	All captured, one died from injuries sustained during capture.
	1	5	
14 "	1	3	Seven captured, 1 escaped. Old nest with egg shell found in hole, about 4 feet deep, at base of cliff above steep rock slide.
	1	5	
14 "	1	4	Near tundra pond on hillside 1/2 mile southwest of camp. None captured.
16 "	1	5	Found on steep rock slide 20 yards east of location where 7 goslings captured on 14 July. Family photographed.
Total young seen		31	Total captured--18.

Mortality

Evidence was found by Alec Peden that some goslings perish, probably during high gusty winds which sweep the steep hillsides. He found two dead goslings at the base of a steep slope on the beach about 1 1/2 miles east of the camp site.

Plumage

Murie (1959) reviews the literature concerning races of the Canada goose found nesting in the Aleutians. Presumably the races minima and leucopareia are separated to a large degree by plumage. The plumage differences between individuals that we observed were quite striking. We saw several breeding pairs in which only one member exhibited a white neck ring. We also saw breeding pairs in which both showed the neck band (Fig. 10). Thus, this characteristic appears to vary with individuals regardless of maturity.

One of the diagnostic characteristics of leucopareia is a white neck ring. Some individuals have a very light breast, making it difficult (in photographs) to tell whether or not a neck band is present. Others have distinctly brownish breasts. It is easy to note the presence or absence of a neck band on these dark-breasted individuals.

Under a binocular I examined four 35 mm color slides and evaluated the color pattern of 64 adult geese (subadults may have been included among the nonbreeders). I noted the following:

White neck band distinct	47	73%
White neck band lacking	9	14%
Breast light; neck band present?	<u>8</u>	<u>13%</u>
	64	100%

Among the birds with neck bands visible on the films, the band width varied from an estimated 1/4 inch to about 2 inches.

I wonder if the variations in plumage, as noted above, have caused confusion in the identification to race of geese in the Aleutian area? As others have pointed out, it would seem strange if two races were sympatric.

Population and habitat

The population of geese could not be reliably estimated from our limited observations. The nesting habitat appears to be primarily the steep rubble covered slopes of the island which, in some places, extend from the beach to the tops of peaks. Apparently the broods are kept for some time near the nest site. One brood, approximately 2 to 3 weeks of age, was captured on a grassy bench only about 50 feet from an old nest containing egg shells hatched this season (Figs. 11 and 12). Numerous droppings indicated that the parents kept their brood on grassy slopes and benches in this area.

If as many broods were distributed around the island as we found in the few areas we explored on the north exposure, the nesting population of geese might be greater than the estimate below indicates.

Boeker, on the basis of the generalization that the non-breeding population constitutes about 50 percent of the total population, feels that there are between 200 and 300 geese at Buldir. This estimate is on a count of 120 geese on the lake. Unfortunately, weather did not permit us to make a circuit of Buldir by dory and it is not possible to walk entirely around the island on the beach. Weather conditions, except on two days, would have prevented even observations from the beach.

Captives

After capture, goslings were transported back to camp in fiber cartons lashed to a back packboard. The birds were then placed in a tent (about 7 feet x 8 feet) with a floor covering of dry grass (Figs. 13 and 14). Boeker introduced them to pelleted Purina Game Bird chow by scattering finely broken grasses and sedges over a dish of the food pellets. Within a few hours the birds learned to eat the new food and adjusted well to captivity. Temperatures in the tent were maintained in the middle 60's by means of a small flameless burner. No problems were encountered in maintaining the goslings. The only fatality

was caused when a gosling was apparently injured during capture as it tried to escape or hide in thick vegetation. It was probably stepped on (specimen no. KWK 63-1). During travel the goslings apparently fed normally.

Historical Note

The following material is from Turner (1886).

Turner's observations of geese in the Aleutians are not listed under Branta canadensis leucopareia but for the races hutchinsii and minima. It would seem reasonable to me that all of his observations in the outer Aleutians would apply to leucopareia.

Pages 139 to 141 contain the following information on hutchinsii: "On the Aleutian Islands they are especially abundant to the westward of Unalaska, and breed by scores on Atkha and in thousands on the Near Islands, being so intimately associated with B. canadensis minima as to be indistinguishable in their habits." For minima he states "The westernmost of the Aleutian Islands is also a favorite resort in summer for it. It breeds in greatest abundance on the Semechi Islands and Agattu Island of the extreme western islands. The Semechi Islands [this includes

Shemya, Alaid, and Nizki] are especially adapted as breeding grounds. They lie in 174° E. longitude, and are low and level, covered with marshes and lagoons rank in aquatic vegetation among which the geese breed in thousands."

"Attu Island has a great many blue foxes (V. lagopus) on it; hence is resorted to only by adult birds. The birds arrive poor and lean but by the 10th of September they abound in thousands and are very fat at this time."

"At Atkha the people rear a number of the goslings of this species. The young are obtained from the islets lying contiguous to the larger islands in that vicinity. From the best information I could obtain this and Hutchins' Goose are the only species which breed on the Aleutian Chain; and, none of them breed east of Unashka [Yunashka Island in the Islands of Four Mountains]. On Unashka, Amlia, Atkha, Athakh, Kanaga, Tanaga, Kiska, Bouldyr [Buldir], Semechi, and Agattu are the greatest breeding grounds of the Aleutian Islands. On some of these islands foxes of various kinds are numerous, hence, while they are excellent feeding grounds for the geese in the fall, the geese are compelled to rear their young on the nearer islets, where the foxes cannot molest the young goslings, unless there happen to be lakes containing small islands in them. There the geese

are secure from foxes and other animals."

The above information would indicate that foxes were not introduced to most of the goose nesting islands until after 1880. Foxes apparently had been on Attu prior to historical records, for, as Turner points out, the geese did not nest on this island at the time of his visit. Some observers have considered hunting as an important contributory factor in the reduction of this goose. It appears that the healthy goose population on Buldir, the only known nesting island where foxes were not introduced, would point with certainty to the introduction of foxes as the cause of the near extinction of the Aleutian Canada Goose. It is beyond reasonable doubt that foxes would find geese easy prey on an Aleutian Island and that until they are eradicated there is no hope of re-establishing geese on islands infested with foxes.

Anas platyrhynchos. Mallard. One adult male in eclipse plumage was observed on a small tundra pond on 11 July near Northwest Point.

Anas crecca nimia. Common Teal. Two adult females were seen. One on a small tundra pond at an altitude of about 300 feet and another on a pond near the beach on 14 July. Both

areas are near Northwest Point. It was evident that the Common Teal is not nearly as abundant on Buldir as it is on Amchitka Island.

Histrionicus histrionicus. Harlequin Duck. One adult female frequented the area just beyond the surf in front of our camp during our stay on the island. In addition, several adult males and females were seen in different places along the coast.

Somateria mollissima. Common Eider. On 9 July I saw three mothers with newly hatched broods of four, two, and six chicks during about a mile walk along the north coast. They were apparently foraging as they swam among tidal rocks. I saw only two adult males, but on 17 July I saw 12 adult females, plus 11 small ducklings together on the sand beach near our camp at twilight. On several occasions during our stay, adult females came to the mouth of the stream near our camp.

Mergus serrator. Red-breasted Merganser. Two or three individuals were seen in flight offshore from our camp.

Haliaeetus leucocephalus. Bald Eagle. A pair of Bald

Eagles had a nest containing one young beside the stream about 200 yards inland from the beach near our camp site. On 11 July the remains of two or three adult geese were found at the nest. Refuge Manager Jones, in order to prevent further predation, had the three birds killed. The nest contents were examined and the following species were identified:

<u>Species</u>	<u>No. of individuals</u>	<u>Remarks</u>
Glaucous-winged gull	5	Four of these were freshly killed, downy young, one was an adult. There was also the shell of a gull egg.
Ancient Murrelett	3	Wings and sternum.
Horned Puffin	11	Wings, feet, and sternum.
Crested Auklet	1	Wings and a few breast feathers.
Tufted Puffin	1	Wings and foot.
Canada Goose	3	Wings

The goose bones were saved (KWK 63-8) and sent to the U. S. National Museum for positive identification.

We saw one additional eagle in subadult plumage on a barren slope about 1,000 feet above sea level.

Falco peregrinus. Peregrine Falcon. Near Northwest Point at least two pairs of falcons had eeries. One of these was on the western exposure about 1/2 mile south of the point. The other was about 3/4 of a mile east of the point. The eeries were not found but the behavior of the falcons, constantly calling and flying overhead, indicated that nests were somewhere on the cliffs or steep slopes. The falcons' favorite food appeared to be the Ancient Murrelett, as the sternum, breast feathers, and wings of a number of these birds were found. The second most often found remains showing typical falcon mutilation were of the Crested Auklet.

Stercorarius parasiticus. Parasitic Jaeger. About six or eight pairs apparently nested on the nearly flat aluvial plane inland from our camp. The birds constantly frequented this area and harrassed the nesting Glaucous-winged Gulls. On 11 July we saw 15 to 20 pairs during our hike to the lake about 1 mile from camp. Two newly hatched downy young were found on a hillside at about the 700-foot level. Vegetation there was mostly prostrate willows and short sedges and grasses. The adults displayed broken wing behavior and while we were in the

vicinity frequently made diving attacks on Glaucous-winged
Fulls. All jaegers seen at Buldir were of the dark phase.
This is also the only color phase I have seen at Amchitka.

Larus glaucescens. Glaucous-winged Gull. This gull
nests from the beach to an altitude of at least 700 feet on Buldir.
We found young up to about 2 weeks of age when we arrived and
during our stay found unhatched eggs, hatching eggs, and newly
hatched young. The total number of nesting gulls within about
a 1-mile radius of our camp would probably approach 200 or 300,
but no effort was made to make an accurate count. Some of the
nests were in vegetation (wild celery and rye grass) up to 2 feet
high. Gulls, presumably near their nesting sites, habitually
rested on hillsides that surrounded the valley in which we camped.
A flock of about 100 gulls bathed in the lake on 11 July. It is of
interest to note that on such islands as Amchitka where foxes
are present no gulls nest on the main island as they do on Buldir.
At Amchitka, nesting is limited to small offshore islets. However,
there are certain places on Amchitka where gulls gather during
the breeding season and it will be interesting to observe, after
the foxes have been eliminated, if nesting will be established here.

On 9 July, Jones, Berns, and Boeker banded 33 young gulls.

Additional bandings were accomplished after this date.

Rissa tridactyla. Black-legged Kittiwake. There is a large colony at East Cape on Buldir and a flock of about 300 bathed in the lake in company with the Glaucous-winged Gulls on 11 July. Flocks of up to 100 often passed our camp. On 12 July an east wind, blowing steadily at about 40 miles an hour and gusting to 60 or more, apparently created air currents which attracted the kittiwakes to an area about 1/4 mile offshore from our camp. About 2,000 wheeled up to about 1,000 feet or more and then returned to rest on the water while others wheeled upward in a rotating column. Several smaller flocks of up to 500 often approached the stream mouth but did not come to the beach.

Rissa brevirostris. Red-legged Kittiwake. On 12 July, during the wind storm described above, I saw at least 10 Red-legged Kittiwakes among the several thousand Black-legged Kittiwakes off our camp. Their mantle, slightly darker than that of the Black-legged Kittiwake, and bright red legs made them fairly conspicuous among the other species. I regret that

I was unable to examine the colony at East Cape, since this species has never been positively recorded as nesting in the Aleutians.

Sterna paradisaea. Arctic Tern. On 6 July one was seen on a floating kelp patch about 10 miles east of Gareloi Island. None, however, was observed on Buldir.

Uria aalge. Common Murre. Although this species apparently nests in large numbers at East Cape, few frequented the vicinity of our camp. On 11 July a flock of five floated on the water near Northwest Point and on 15 July two came near shore in front of our camp.

Uria lomvia. Thick-billed Murre. Several individuals believed to be of this species flew by at a distance from our camp.

Cephus columba. Pigeon Guillemot. This species was not abundant at Buldir but scattered pairs were seen going to and from the rock slides and feeding near shore. Two birds (collection nos. KWK 63-6 and KWK 63-7) were secured. One of these had a rare cottid Sigmistes smithi in its bill, which was turned over to Alec Peden for the Wilimovsky "Fishes of Alaska" study program.

Synthliboramphus antiquum. Ancient Murrelet. The

remains of a dozen or so, which showed mutilation typical of that inflicted by Paragraine Falcons, were found on beaches and two individuals were seen leaving the island at almost dark. It would appear that the falcons caught these birds at dawn and early evening when they move between their nest sites and the ocean. None was seen during daylight near Buldir and no nests were found.

Cyclorrhynchus psittacula. Parakeet Auklet. This is

the least abundant of the three auklets we found nesting on Buldir. A dozen or so formed a colony in a small rock slide near the east end of our camping beach. Few individuals nested among the great auklet colonies in the large rock slides about 1/4 to 1/2 mile east of the camp. They appeared to be outnumbered by the other species by about 1,000 to 1.

Aethia cristatella. Crested Auklet. Hundreds of thousands

of these birds nested in the rock slides from 1/4 to 1/2 mile east of our camp. The birds usually left the slides singly or in small flocks early in the morning. During the day large flocks returned from the sea, circling several times before landing

near their nests. In mid-afternoon, another large exodus occurred and during twilight hours from about 8 to 11:30 p. m. vast flocks returned to the nesting area.

Aethia pusilla. Least Auklet. On 6 July shortly before sunset about 10 miles east of Gareloi Island a few single birds were seen. On 7 July at sunset, 5 miles north of Kiska, many thousands flew in flocks toward the island. At Buldir they nested in the same areas occupied by the Crested Auklet. They numbered many thousands but were outnumbered by the Crested Auklet.

Fratercula corniculata. Horned Puffin. Many pairs nested in the same rock slides as did the Crested and Least Auklets. In late afternoon, pairs were seen resting on the boulders near their nest sites. They were apparently outnumbered about 100 to 1 by the auklets. Unlike the following species, the Horned Puffin appears to be limited primarily to rock slide areas.

Lunda cirrhata. Tufted Puffin. Although this species nests to some degree in the rock slides, their preferred nesting habitat appears to be the steep vegetation-covered slopes where they excavate burrows. Many thousands nested near Northwest Point. Some in burrows under deep vegetation on a plateau 200 to 300 feet above sea level, others on the steeper grassy slopes. No Horned Puffins were seen nesting among them there.

Asio flammeus. Short-eared Owl. On 11 July, Alec Peden picked up a carcass which had been damaged by some bird of prey. The owl was found on high ground about 1 mile southwest of the camp (photographed but no specimen kept).

Troglodytes troglodytes tanagensis. Winter Wren. The vulnerability of this species to rats has been discussed previously (Kenyon, 1961). It was therefore of interest to me to examine a beach at Adak that I had visited in 1947. Along this stretch of beach in that year I found wrens very numerous, I would estimate that I saw 10 to 15 in walking about 200 to 300 yards of beach. On 4 July 1963 I walked this same beach and saw no wrens.

Sea urchin testes lying above the high tide line and having a hole bitten in them and the insides eaten out, as is typically done by rats on Amchitka, indicated the presence of rats in this area. Jones informs me that there are certain areas on Adak, well isolated from human habitation, where he has seen wrens in recent years. Possibly wrens do survive along the cliff-like outcrops rising from steep slopes behind the beach line. In one such area, above the beach which I explored, I believe I heard a wren singing. It is probable, however, that since 1947 the rat population has spread considerably from the garbage dumps on Adak. Undoubtedly, these breeding centers, which offer a constant food source for rats on Adak, will eventually cause the island to be heavily populated with rats. On 6 July the Coast Guard Cutter CLOVER allowed us to land at Cape Yakak (the southwestern tip of Adak). We remained on shore for about an hour and I explored about 1/4 mile of beach. No wrens were seen or heard and fresh rat diggings and runways were found in grassy areas surrounding World War II installations. It would appear that the wren population of Adak has been greatly reduced and in future years as the rat population continues to thrive the wrens may be exterminated from this island.

When we landed on Buldir Island on 7 July, the first land bird we saw or heard was the wren. They sang continuously during the day about our beach camp, even during violent wind and rain storms. Their habitat is predominantly among drift logs and rocks on the beach and in the vegetation immediately bordering the beach. I also saw several along the tops of cliffs where steep grass-covered slopes were exposed to sea wind. I saw few in vegetation at any distance from the beach or beach cliff areas.

On 8 July I counted seven singing males along 250 yards of beach near our camp. There were many subadults in this area, some still being fed by parents and others independent. They constantly chased beach flies, which appear to be their primary food.

If the wren is to survive on islands which are still not infested with rats, it is essential that all parties visiting these islands exercise extreme caution not to introduce rats hidden in boxes of food supplies. The danger of rat introduction by shipwreck is constant and increasing because of the large number of Japanese fishing and whaling vessels in the North Pacific and Bering Sea adjacent to the Aleutian Islands.

Leucosticte tephrocotis griseonucha. Gray-crowned

Rosy Finch. Scattered pairs with flying young were seen everywhere we went on Buldir. Unlike the foregoing species, the Rosy Finch adapts well to human habitations and their accompanying predators. The rosy finch nests in buildings where they are safe from rats.

Melospiza melodia. Song Sparrow. On Adak in 1947

the Song Sparrow was abundant along the same beach examined for wrens. On 4 July 1963, along this same beach in a 1/2-mile walk, I saw only two Song Sparrows. No young were seen. Certainly their population has been greatly reduced on Adak, but those which nest away from the immediate beach area probably are able to escape rat predation, at least to some degree.

At Cape Yakak along 1/4 mile of beach I saw no Song Sparrows. On Buldir they were abundant along the beachline and I saw a number at some distance inland from the beach. Along 250 yards of beach near the camp I found six pairs with flying young. Two pairs were seen along the lake shore at an altitude of 800 feet and inland.

Calcarius lapponicus alascensis. Lapland Longspur.

Nesting was in progress on Buldir. The parents from one nest near our camp flew back and forth frequently from the beach to an inland nesting site. We saw flying young at several locations well inland. Apparently this species is a widely scattered nester on Buldir.

At Adak on 4 July 1963 I counted eight singing males along 2 miles of road that skirts the north shore of Andrews Lake.

Plectrophenax nivalis townsendi. Snow Bunting. The Snow Bunting is not abundant on Buldir. I saw only one adult male near our camp area during the 13 days we were on the island. One pair seen on 11 July were apparently foraging for young in a nest and a pair was seen on the ridge near Northwest Point.

Enhydra lutris. Sea Otter. On 6 July 1963, between 9 and 9:30 a. m., we passed through Kagalaska Strait. A total of 75 otters was seen. Those which were close enough to the ship for identification of sex were all males. I saw no sea otter pups. On 6 July when we landed at Cape Yakak, the men on

the first landing boat reported eight sea otters occupying the landing cove. When I went ashore on the second boat I saw one otter.

At Buldir Island we saw an adult male on several occasions near our camp. This was the most fearless wild individual I have ever seen. One evening as it lay on the sand beach I walked to within 6 feet of it and took photographs while it watched me quizzically before it became alarmed and took to the water. On a dory trip to East Cape, three lone adults and four females with pups were seen. On 14 July a female with a pup about 1 month old passed near the camp.

Harsh weather conditions prevented a trip around Buldir Island. Thus, our observation of five mothers with pups and four lone adults is not complete.

The area near Northwest Point apparently did not offer ideal sea otter habitat. Alec Peden, who spent considerable time in the water near shore collecting fishes, reported that he gained the impression that marine algae, invertebrates, and fishes were less abundant in this zone at Buldir than they are at other Aleutian Islands where he has collected. I found no sea urchins along the beaches and Peden remarked particularly on their scarcity.

Kelp beds not far from shore in several areas and rocks and islets near shore, particularly at Northwest Point and East Cape, appear to offer adequate habitat conditions.

Eumetopias jubata. Steller Sea Lion. The sand beach on which we landed on 7 July was occupied by about 1,500 adult and subadult male sea lions. This beach is the hauling ground for a breeding colony which extends around Northwest Point (Fig. 15). The beaches of the small islets off Northwest Point are also used as hauling grounds. The breeding colony is continuous along about 3/4 mile of beach. On 11 July I counted and estimated pups (using a Veeder Root hand tally) along this breeding beach. Most of the young were several weeks old and just learning to swim. My total was 1,950 living pups and 151 dead ones. Some of the dead had apparently been trapped and crushed by boulders moved by adults during breeding ground activity. One had apparently been pinched to death by the sharp roots of a drift log that had rolled onto it. The colony was in constant activity, judging from the continual roar at all hours of the day and night.

Phoca vitulina. Harbor Seal. Scattered individuals were seen on the rocks and in the surf along the beach. One colony of 100 or more, many of them with newborn pups, occupied the beach north of Southwest Point. On 14 July two females with young were among the rocks near our camp.

Phocoenoides dalli. Dall Porpoise. On 6 July, 5 miles southwest of the tip of Tanaga Island, between 30 and 60 individuals in several small groups surfaced, apparently feeding, but did not approach the ship.

Physeter catodon. Sperm Whale. On 6 July, 5 miles southeast of Gareloi Island, we saw two large individuals. On 7 July, 10 miles northeast of Kiska, we saw at least three or four.

Balaenoptera acutorostrata. Little Piked Whale. In Kagalaska Strait on 6 July we saw two. One appeared to be feeding and the other jumped clear of the water on three occasions.

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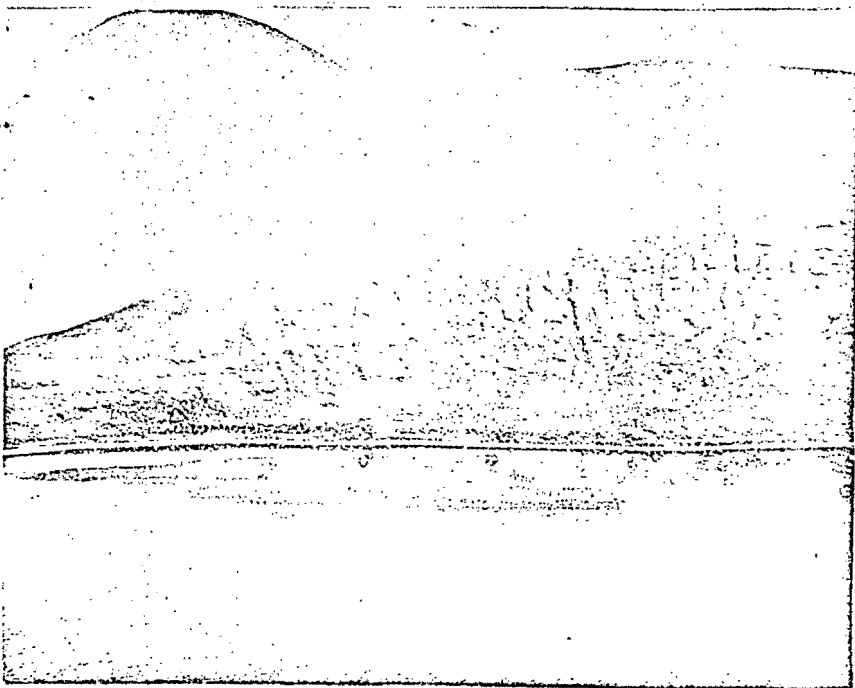
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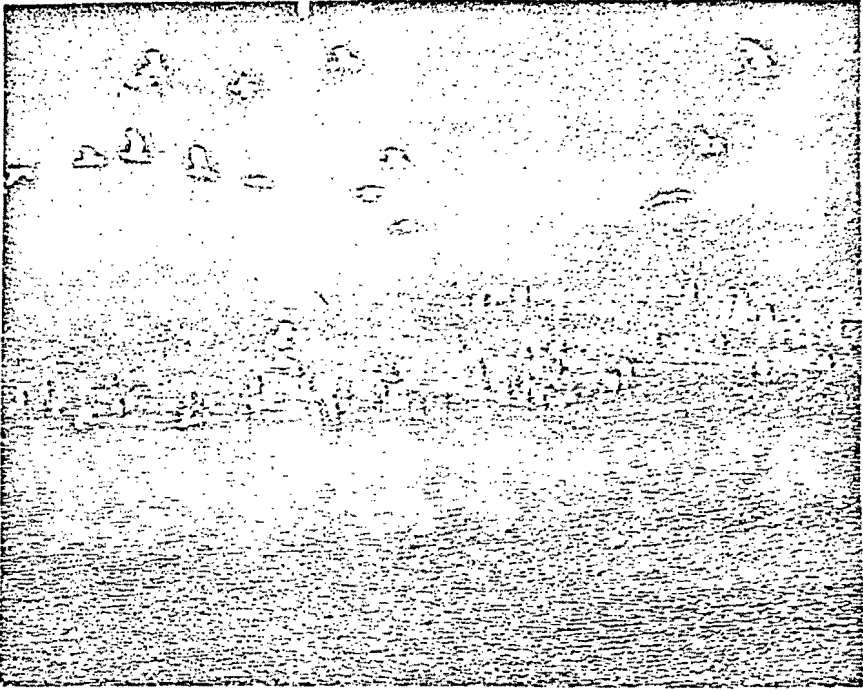
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Figure 3. --The landing beach at the mouth of the largest flat floored valley on Buldir. Adult male sea lions are hauled out in the foreground. When we arrived the entire beach was covered with them. Drift logs litter the cobble beach. At right center are vehicle tracks left by a landing party, probably about 1943. At right in the middle distance lie the remains of a P-38 aircraft. It presumably made an emergency landing during World War II. The tents are in the middle distance, left, near the stream mouth.

12 July 1963. KWK 63-16-7.

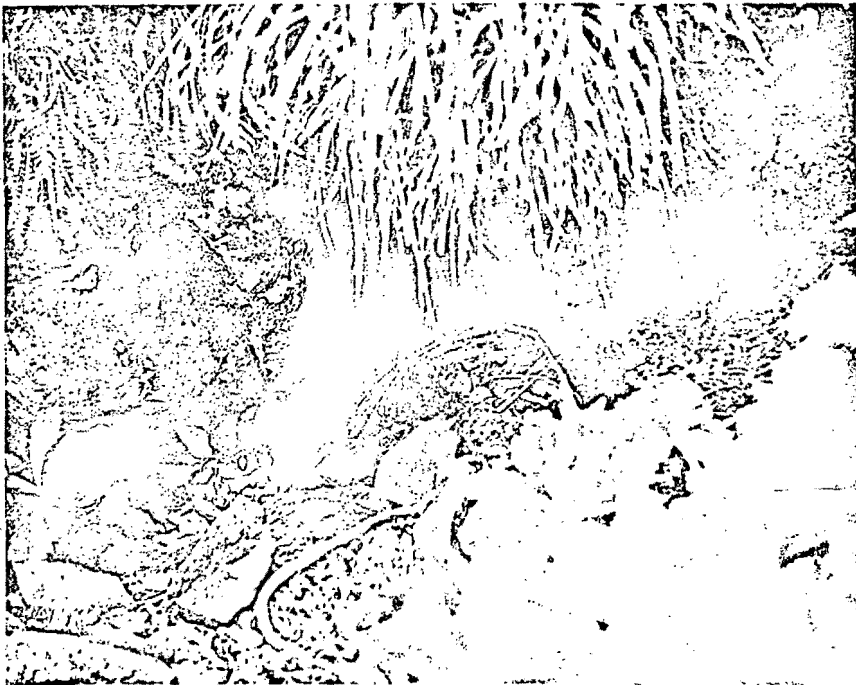
Figure 4. --Common Kittiwakes fly above a group of Glaucous-winged Gulls and a flock of 120 Aleutian Canada Geese on Buldir's only lake. Several Red-legged Kittiwakes were tentatively identified mixed with the Black-legged. Within a few minutes after this exposure was made, the entire area was obscured by fog. 11 July 1963. KWK 63-12-9.

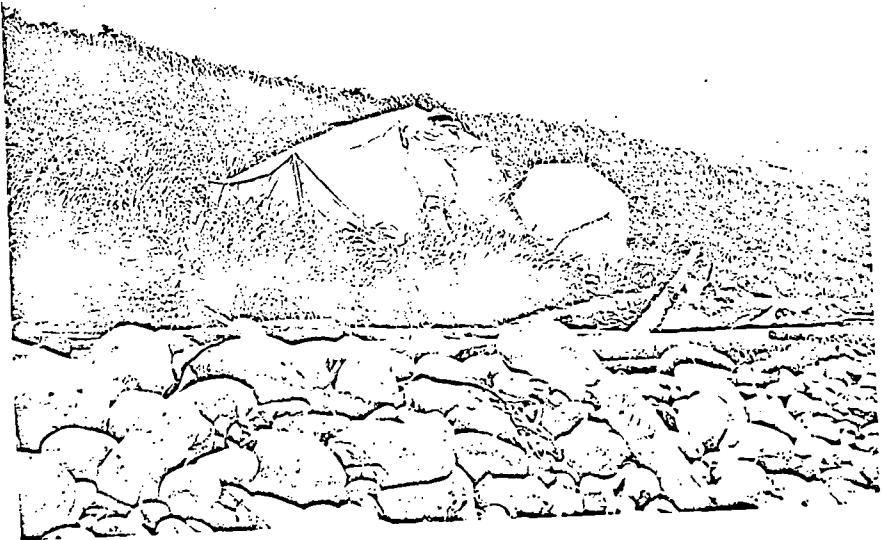
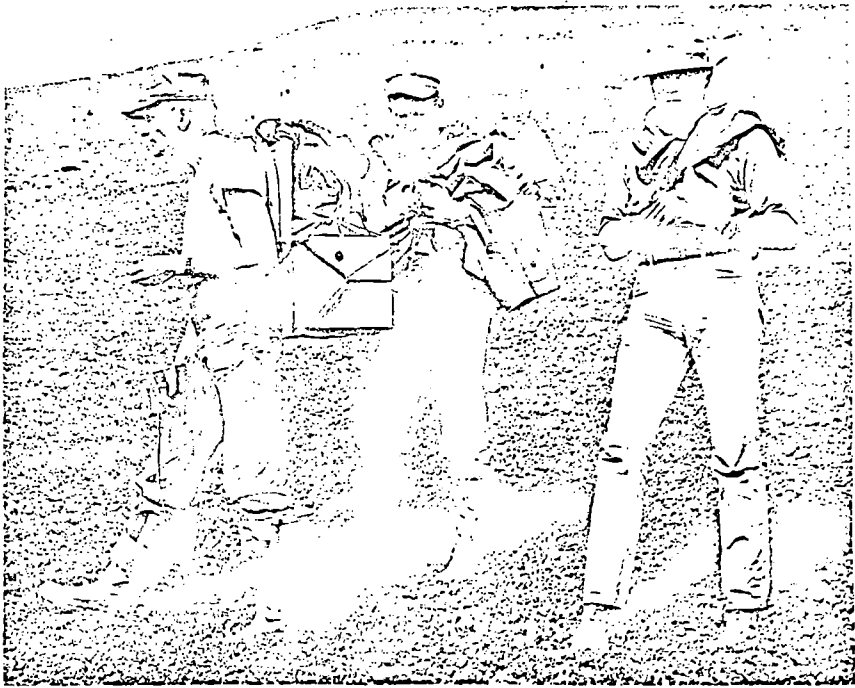


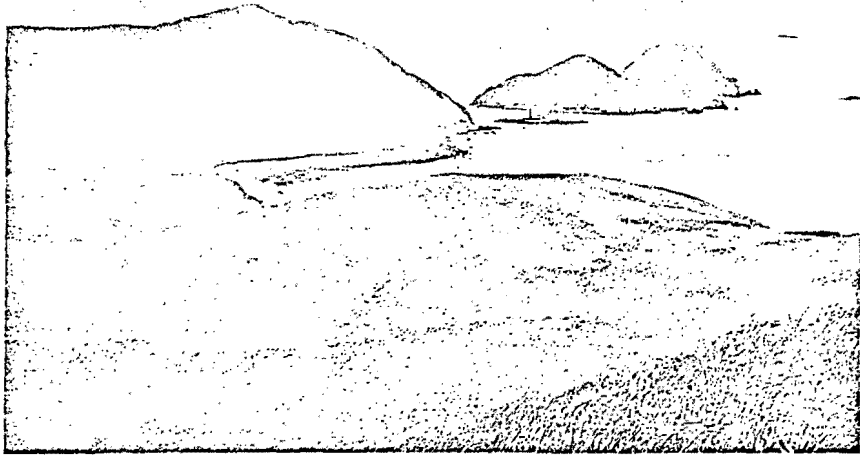












Corrections & additions

Page #

- 1 - At end of last P add: "Six bird specimens were obtained for the collections of the U.S. National Museum (see annotated list)"
- 6 - 3rd line up from bottom: change "were" to "was".
- 21 - 5th line up from bottom: insert after "island" "except on an islet in a lake"
- 28 - After last P add: "Two wrens (KWK 62-2 and KWK 62-3) were taken on Buldir and the specimens sent to the U.S. National Museum."

Figure 6 - At end of caption add: 11 July 1963.
KWK 63-12-11.

Fig 14 - KWK 63-10-4