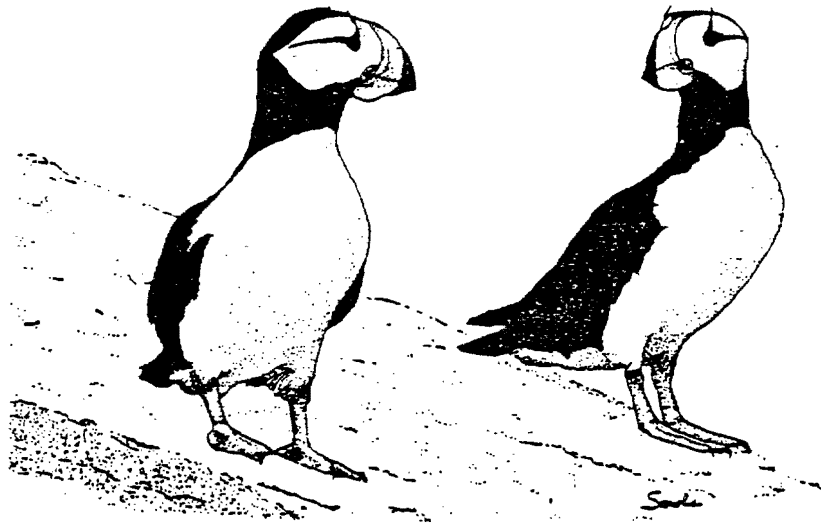


A SURVEY OF THE CHAMISSO ISLAND NATIONAL WILDLIFE REFUGE

11 - 14 August, 1977



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INTRODUCTION

The Chamisso Island National Wildlife Refuge, established in 1912, is located approximately 105 km south of Kotzebue at 66°13'N and 161°52'W. The refuge is composed of Chamisso Island, (178 hectares) Puffin Island, (4 hectares) and several offshore rocks (figure 1).

Chamisso Island is approximately 1.6 km wide and slightly over 1.6 km in length. A sand spit is the dominant feature of the eastern shore. Here are found several depressions; the last remnants of Eskimo barabaras. The remainder of the shoreline of Chamisso is composed of small sandy beaches, rocky outcrops, or short cliffs. Maximum elevation is 75 meters. Relatively few seabirds utilize Chamisso Island.

Puffin Island rises radically from the sea. The perimeter of the island is almost entirely steep cliff. The greater number of seabirds is found on Puffin Island.

The vegetation on Chamisso Island is primarily lowland tundra. Small hummocks are found over the entire island. Dominant plant species are: crowberry (*Empetrum nigrum*), blueberry (*Vaccinium uliginosum*), Labrador tea (*Ledum palustre*), dwarf birch (*Betula nana*), alder (*Alnus crispa*), willows (*Salix spp.*) and sedges (*Carex spp.*). The vegetation on Puffin Island is much less diverse; being primarily grasses, wormwood (*Artemesia sp.*) and monkshood (*Aconitum delphinifolium*).

HISTORY

The bird cliffs on Puffin Island have long been a source of seabird eggs for the local Eskimos. Egging is still carried on to this date and its affect on these populations of seabirds is unknown.

The first white men to see the island were the crew of the Russian vessel RURIK, under the command of Otto von Kotzebue in 1815. The island was named for Louis Adelbert von Chamisso, the scientist of that expedition. Tarleton Bean (1882) collected passerine birds at Chamisso Island on 31 August, 1880. The U. S. revenue steamer Corwin stopped at Chamisso Island very briefly during the summer of 1881. However, the expedition ornithologist, E. W. Nelson, (1883) makes little mention of the area in his report. Joseph Grinnel visited Chamisso Island on 9 July, 1899. He also spent from 9 July - 12 August and 27 June - 8 July, 1899 at Cape Blossom, an area approximately 85 km

north of Chamisso. His "Birds of the Kotzebue Sound Region" (1900), remains an important reference work for that area today. Seymour Hersey (1916) visited the refuge in 1914 and made several observations on the seabirds. Alfred Bailey passed Chamisso Island while heading south in the early spring of 1922 and was present at Cape Blossom on 31 July, 1921. His 1948 publication includes an interesting photo of Puffin Island locked in by ice. The refuge was visited next by Ira N. Gabrielson (Gabrielson and Lincoln, 1959) in late July of 1946 and later by Fish and Wildlife Service biologist Will Troyer (1970) who spent 27 and 28 July, 1968 there. Unfortunately, Troyer was unable to get on Puffin Island. He did, however, take black and white photos of Puffin Island which allows comparison with photographs that we took in 1977. It is unfortunate that no previous investigators supply population estimates for the seabirds inhabiting the refuge with which we could compare our findings.

We visited the Chamisso Island National Wildlife Refuge from 11-14 August, 1977. Our main task was to estimate the populations of seabirds using the refuge. Access to Chamisso Island was by inflatable boat from Kotzebue.

METHODS

Population estimates of seabirds were made offshore, from an inflatable boat. One problem we experienced was the ready flushing of murres, kittiwakes, and puffins from the cliffs when we approached closely enough to identify the murres. Thus, most of our counts were obtained away from the cliffs. This often precluded the counting of individuals when the birds were densely packed, as they often were on Puffin Island. In that situation we estimated group sizes of birds. We made our surveys near mid-day when colony attendance for murres was highest. For censusing murres and Horned Puffins, (Fratercula corniculata) we estimated or counted individuals; for Black-legged Kittiwakes (Rissa tridactyla) we counted nests. The majority of Horned Puffins nesting on Puffin Island were burrow nesters. When we did count Horned Puffins we recorded whether the birds were sitting near burrows, or crevices and talus. In order to determine the density of Horned Puffin burrows we established 3 permanently marked 25m² plots and counted the number of burrows in each.

Two groups of offshore rocks provided excellent platforms for photographing the cliffs of Puffin Island. Two series of photographs were taken in black and white and color.

We also did a shoreline survey from Elephant Point to Church Rock along the mainland east of Chamisso Island and another covering much of the east side and the entire west side of the Choris Peninsula,

north of Chamisso Island (figure 1). These results are included in the "Alaska Seabird Colony Catalog" and will not be discussed further here.

RESULTS

Figures 2 and 3 show the results of our seabird surveys taken on 12 and 13 August. On the 13 August survey we counted only Horned Puffins. The difference in the number of Horned Puffins between the two surveys is astounding. On the morning census, we counted only 481 birds while on the evening census of 13 August, 2083 puffins were recorded. Daily attendance on the colony has been shown to vary during the day for various seabird species (Wehle, 1976; Hickey and Craighead, 1977) and clearly the Horned Puffins on Chamisso Island followed this pattern. Obviously, our census did not include birds in burrows or those away from the colony. Thus we estimate that up to 4500 Horned Puffins may use Chamisso Island.

As did Troyer (1970), we found a small colony of Thick-billed (Uria lomvia) and Common Murres (Uria aalge) on Chamisso Island. Of the birds that did not flush during our survey, 23 were Thick-billed and 41 were Common Murres. Approximately 100 birds flushed at the time of our count. Another 145 murres, primarily Common Murres, were found on a small offshore rock on the north side of Chamisso Island. Other species observed during our shoreline survey of Chamisso Island were one Red-necked Grebe, (Podiceps grisegana) 200 Surf Scoters (Melanitta perspicillata), and 2 Common Eiders. (Somateria mollissima).

We surveyed both South and Mid Rock on 13 August, (Table 1). Both these small islands possessed a variety of breeding seabirds although they were present in few numbers.

The majority of the seabirds on the refuge use Puffin Island. Table 2 indicates the species composition and number of seabirds censused on 13 August from 1200 - 1400, and our best estimate of the seabird population. In addition to the census, we made 5 counts of murres at Puffin Island to determine species composition. The counts revealed that Common and Thick-billed murres were in a ratio of 2.9:1. This figure was used to determine total number of each murre species.

The most striking feature of Puffin Island is the number of Horned Puffins nesting in burrows. We found that 70% of the puffins that we counted were sitting in a soil habitat. In the plots we established on Puffin Island, we found 19, 29, and 23 burrows ($\bar{x} = 23.6$)

or .94 burrows/m² for the three plots. By creating such a dense matrix of burrows, the Horned Puffins may be radically altering the habitat on Puffin Island. A comparison of photographs taken in 1968 and 1977 (Fig. 4a&4b) show that a considerable loss of vegetation has occurred with subsequent erosion. The digging of the puffins may only hasten the erosion.

Incidental to our surveys, we made observations on the nesting phenology of Glaucous Gulls, Black-legged Kittiwakes, Common and Thick-billed murres, and Horned Puffins.

At the time of our visit, chicks of both Glaucous Gulls and Black-legged Kittiwakes were quite large and well along in obtaining the juvenal plumage. All Glaucous Gull chicks, except for 3 siblings occupying a cliff nest on Chamisso fledged. No Black-legged Kittiwake chicks had fledged by 14 August. We did see several kittiwake nests with two large chicks which suggests that production may have been high.

Eggs of the Common and Thick-billed murres began to hatch on or near 11 August. On 11 August, we observed a Thick-billed Murre brooding a recently hatched chick on Chamisso Island. A newly hatched Common Murre chick was seen on Puffin Island on 12 August and another on 13 August. We only witnessed two Common Murres arriving on colony with fish during our stay suggesting that very few chicks were present. Grinnel (1900) found fresh eggs on 9 July. Assuming an incubation period of 33 days (Tuck 1960), then hatching of murres in 1899 would have occurred at a time similar to 1977.

Eggs of the Horned Puffin also began to hatch during our stay. We handled several pipped eggs but only observed 1 chick. We observed only two Horned Puffins with bill loads, again suggesting that few chicks were present. Grinnel (1900) found fresh eggs on 9 July but Hersey (1916) found many young on 2 August, as well as eggs under incubation.

Raptors

On our 12 August survey, we saw 5 Ravens on Chamisso Island. We also found what remained of an old Raven's nest on the southeast side of Chamisso Island.

Three Gyrfalcons (Falco rusticolis) were seen during our brief stay, one of which was a hatching year bird. A pair could have nested here in 1977 as both food and nest sites are available. We found the remains of five Black-legged Kittiwakes on Chamisso Island, possible prey items of the falcons.

Roseneau and Springer (in Fyfe et al., 1976) reported that Chamisso Island looked like good Peregrine Falcon (Falco peregrinus) habitat. They also report that a female Peregrine, collected on an unknown date from Chamisso Island is in the American Museum of Natural History (AMNH). Clayton White (pers. comm.) informed us that a pair of birds from Chamisso Island is in the AMNH. These birds may be the pair that Hersey (1916) collected at Chamisso on 1 August, 1914.

Mammals

We found 20 Spotted Seals (Phoca largha) resting on a small group of rocks between Chamisso Island and Puffin Island. Troyer (1970) also reported Spotted Seals. The skeletal remains of a Beluga (Delphinapterus leucas) was found on the west side of the Choris Peninsula, approximately 24 km north of Chamisso Island.

We observed a shrew, possibly Sorex cinereus, foraging about our tent. Our attempts at capturing the animal were unsuccessful.

In addition to the above, we found the scat of a fox, the fecal pellets of an Arctic Hare (Lepus arcticus) and the skull of a reindeer (Rangifer tarandus). The reindeer skull was probably brought over by Eskimos. We did not see either foxes or hares on Chamisso Island. The evidence we did find suggests that both foxes and hares may gain access to Chamisso Island over the ice during winter.

Present Use

As we mentioned earlier, the taking of seabird eggs for food by man is still practiced. On the south side of Puffin Island is a deeply driven stake probably used by egg collectors for rappelling down the cliffs. Other signs of human activity on Puffin Island are not evident.

During the eggging season small groups of people camp on the sand spit at Chamisso Island. Several old campfires are in evidence there as well as discarded cans and small amounts of other trash. In addition, several small tundra burns have occurred when campfires have been placed there. The litter and recent disturbances by man are problems that will grow with increased use of the refuge.

DISCUSSION

The use of burrows by Horned Puffins has been recorded earlier, (Bretherton 1896; Grinnel 1900; Heath 1915; Gabrielson and Lincoln 1959). It is our impression that where sympatric, Horned and Tufted Puffins select different nesting substrates. That is, Tufted Puffins usually

nest in burrows and Horned Puffins usually nest in boulders, rock crevices or large talus. Therefore it is of considerable interest that on Puffin Islands large numbers of Horned Puffins nest in burrows. Our population estimates reveal that very few Tufted Puffins are found at Chamisso. This substantiates Sealy's (1973) view that at higher latitudes Horned Puffins outnumber Tufted Puffins. Conceivably, Horned Puffins use this habitat only when competition from Tufted Puffins is minimal.

Past and present reports of murres on the Chamisso Island National Wildlife Refuge appear to be very irregular. Neither Grinnel (1900), Hersey (1916), Bailey (1948), or Gabrielson and Lincoln (1959) make mention of Common Murres breeding on Chamisso Island. Although he never got on Puffin Island, Troyer (1969) found both species abundant. We feel it improbable that observers such as Grinnel or Hersey could have missed this bird. Possibly, a significant population change may have occurred in the past 78 years or Common Murres could be highly sporadic breeders in certain years.

MANAGEMENT

Although little information on the affect of egging on seabird colonies is available, it is our impression that egging on Puffin Island has had little impact on the population as most cliff ledges are occupied by seabirds. Fortunately, egging occurs early in the nesting season after which some murres, probably the most heavily egged species, may re-lay. Consequently, it is recommended that no action be taken on this issue.

Tourism in the far north is primarily limited to July and August when colonial seabirds are most vulnerable. Troyer (1970) stated that a stop at the Chamisso Island National Wildlife Refuge to look at seabirds, could become part of the thriving tourist industry at Kotzebue. Disturbing seabirds late in incubation or just after hatching may significantly decrease productivity. This may be especially true of Puffin Island where densities of both cliff nesting and burrow nesting seabirds are high. Because of the dense matrix of puffin burrows, Puffin Island is highly vulnerable to human disturbance. We collapsed several burrows while hiking over the island. For these reasons, access to Puffin Island should be severely restricted during the summer.

Regarding future research on the refuge, Puffin Island appears to be an ideal location to study the breeding biology of Horned Puffins and their affect on their nesting habitat. A small boat would be needed

for transport to and from camp on Chamisso Island and a nearby source of water would have to be found. The only landing area on Puffin Island is located on the northeast side (figure 3). Access to the puffin burrows entails a short climb through a coarse talus heavily used by Common Murres and Horned Puffins. Frequenting of this small area would result in the desertion of these birds from their nests.

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ANNOTATED SPECIES LIST

The following lists all the birds seen on the Chamisso Island National Wildlife Refuge. Our observations are included but those of past observers are only cited.

Red-throated Loon (Gavia stellata) - 1 seen on 14 August, 1977;
Troyer (1970)

Red-necked Grebe (Podiceps grisegana) - 1 seen on 12 August, 1977

Pelagic Cormorant (Phalacrocorax pelagicus) - 5 seen on 12 August 1977;
Grinnel (1900); Gabrielson and Lincoln (1959)

Pintail (Anas acuta) - Troyer (1970)

Common Eider (Somateria mollissima) - 8 seen in August, 1977; Grinnel (1900); Troyer (1970)

King Eider (Somateria spectabilis) - Gabrielson and Lincoln (1959)

Surf Scoter (Melanitta perspicillata) - 200 offshore on 12 August 1977;
Troyer (1970)

Red-breasted Merganser (Mergus serrator) - 2 seen near Church Rock on 14 August 1977; Troyer (1970)

Peregrine Falcon (Falco peregrinus) - 2 collected (Hersey 1916)

Gyrfalcon (Falco rusticolis) - 3 seen on 12 August, 1977.

Sandhill Crane (Grus canadensis) - Troyer (1968)

Surfbird (Aphriza virgata) - Gabrielson and Lincoln (1959)

Common Snipe (Capella gallinago) - Gabrielson and Lincoln (1959)

Semipalmated Sandpiper (Caldiris pusillus) - Troyer (1970)

Western Sandpiper (Calidris mauri) - Troyer (1970)

Parasitic Jaeger (Stercorarius parasiticus) - 2 seen on 12 August, 1977

Glaucous Gull (Larus hyperboreus) - breeding bird

Mew Gull (Larus canus) - Gabrielson and Lincoln (1959)

Black-legged Kittiwake (Rissa tridactyla) - breeding bird

Arctic Tern (Sterna paradisaea) - Troyer (1970)

Common Murre (Uria aalge) - breeding bird

Thick-billed Murre (Uria lomvia) - breeding bird

Horned Puffin (Fratercula corniculata) - breeding bird

Tufted Puffin (Lunda cirrhata) - probably breeding

Say's Phoebe (Sayornis saya) - 1 seen on 12 August, 1977; Gabrielson and Lincoln (1959)

Tree Swallow (Iridoprocne bicolor) - 3 seen on 12 August, 1977

Common Raven (Corvus corax) - 5 seen on 12 August, 1977; Troyer (1970)

Wheatear (Oenanthe oenanthe) - 8 seen on 12 August, 1977; Bean (1882); Troyer (1970)

White Wagtail (Motacilla alba) - Hersey (1916) observed a pair carrying food into a crevice.

Yellow Wagtail (Motacilla flava) - 1 seen on 13 August, 1977; Grinnel (1900); Bailey (1948); Troyer (1970)

Water Pipit (Anthus spinoletta) - 1 seen on 12 August 1977; Gabrielson and Lincoln (1959); Troyer (1970)

Redpoll (Acanthis flammea) - seen daily in August, 1977; Bean (1882); Grinnel (1900); Troyer (1970)

Savannah Sparrow (Passerculus sandwichensis) - 2 seen on 12 August, 1977; Bean (1882); Troyer (1970)

White-crowned Sparrow (Zonotrichia leucophrys) - very abundant in August, 1977; all HY birds; Gabrielson and Lincoln (1959)

Fox Sparrow (Passerella iliaca) - 1 seen at Puffin Island on 14 August, 1977; Troyer (1970)

Lapland Longspur (Calcarius lapponicus) - 1 seen on 12 August, 1977; Grinnel (1900); Troyer (1970)

Snow Bunting (Plectrophenax nivalis) - Gabrielson and Lincoln (1959)

Table 1. Species and approximate numbers of seabirds on South and Mid Rocks.

<u>Species</u>	<u>South Rock</u>	<u>Mid Rock</u>
Pelagic Cormorant*	5	
Glaucous Gull (HY)	7	9
Glaucous Gull (AHY)	23	12
Black-legged Kittiwake	22 (nests)	91 (nests)
Unid. Murre	225	206
Common Murre		94
Thick-billed Murre		26
Horned Puffin	84	5
Tufted Puffin		2

*non-breeding

Table 2. Species composition, survey results and estimates of seabirds on Puffin Island, 13 August, 1977.

<u>Species</u>	<u>Number Observed</u>	<u>Estimated Total</u>
Glaucous Gull	22	40
Black-legged Kittiwake	1505 (nests)	4000 (birds)
Unid. Murre	10,201	
Common Murre		11,000
Thick-billed Murre		4,000
Horned Puffin (rock)	1240	
Horned Puffin (burrow)	2840	10,000 (total)
Horned Puffin (flying)	200	
Tufted Puffin	4	8

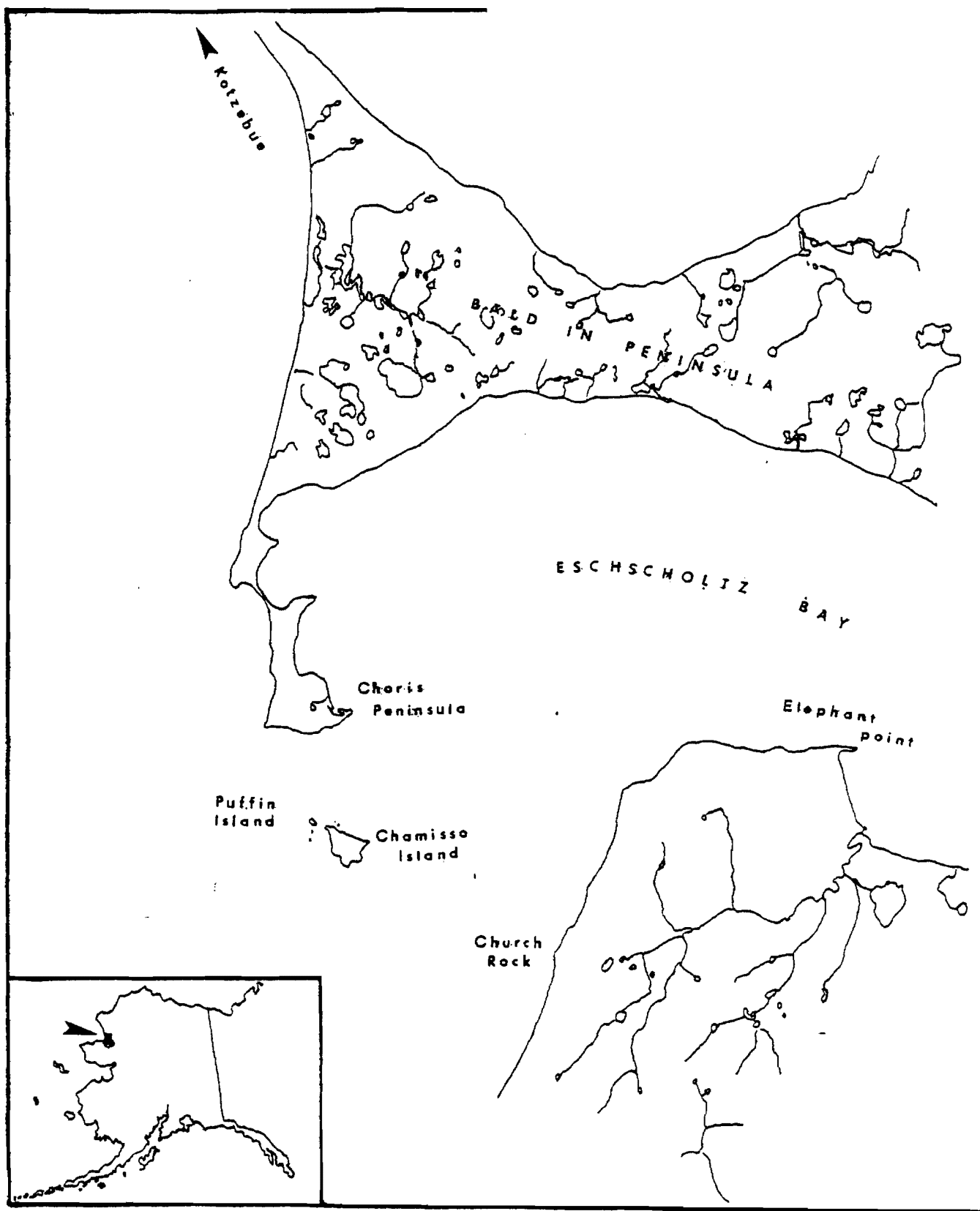


Figure 1. The location of the Chamisso Island National Wildlife Refuge.

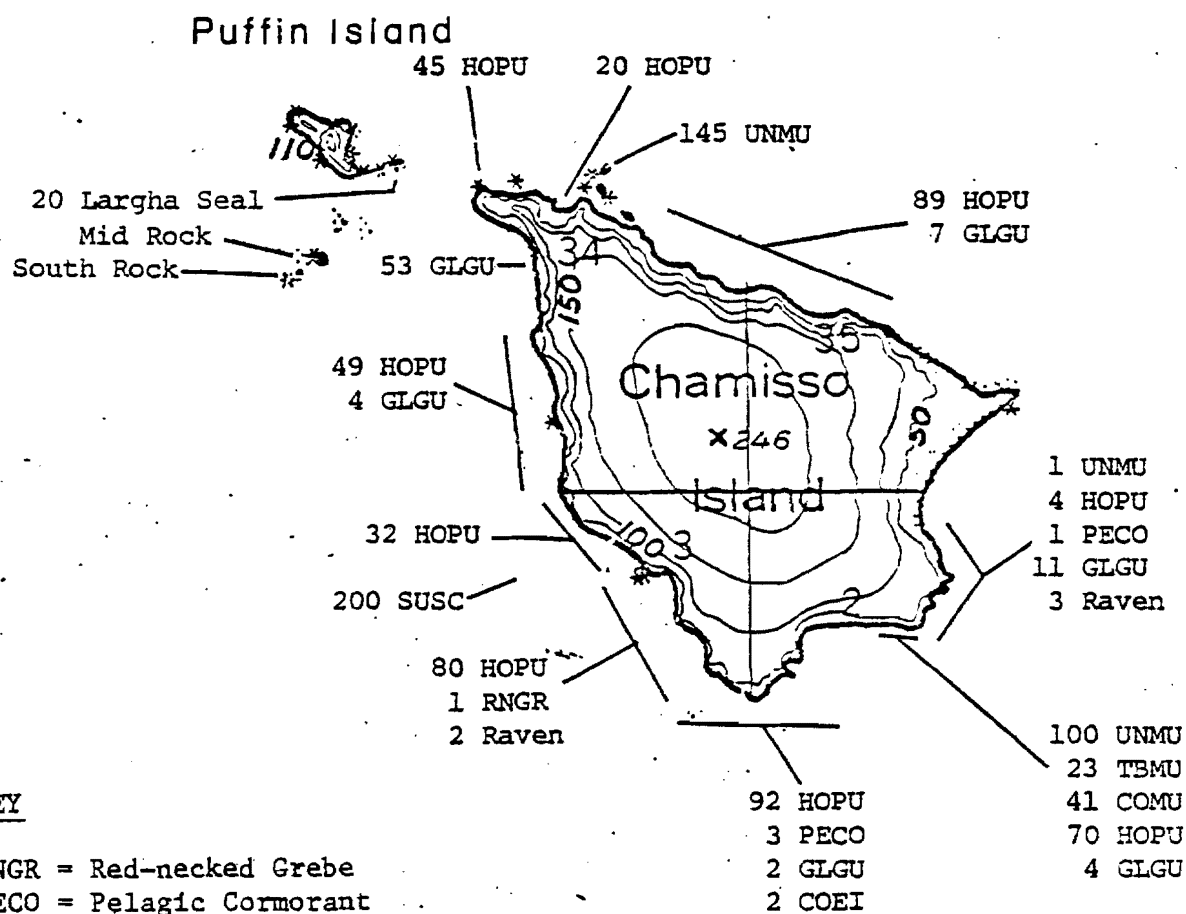


Figure 2. Seabird Census on 12 August, 1977 at 1030 hours.

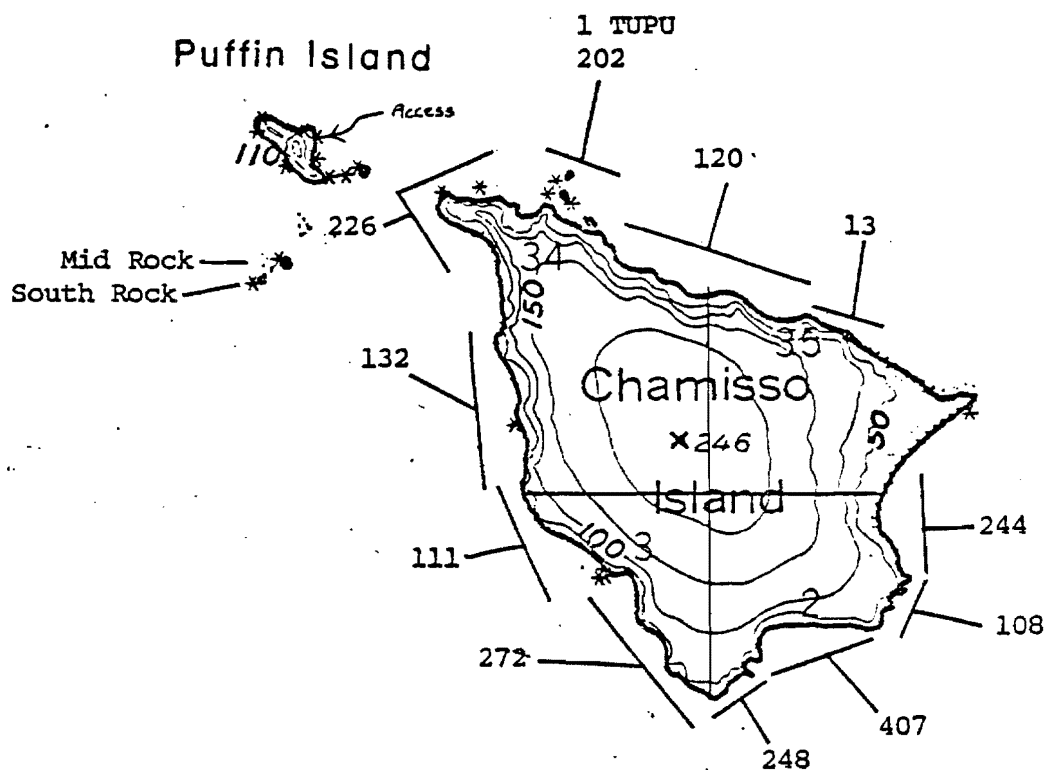


Figure 3. Puffin Census of 13 August, 1977 at 2000 hours.
Only One Tufted Puffin Is Indicated.



Troyer 1968



DeGange & Sowls 1977

Figure 4a. Two photographs of Puffin Island showing vegetation recession from 1968 to 1977.



DeGange & Sowls 1977



Troyer 1963

Figure 4b. Two photographs of Puffin Island showing vegetation recession from 1968 to 1977.