RESULTS OF A BIRD AND MAMMAL SURVEY IN THE CENTRAL ALEUTIAN ISLANDS, SUMMER 1980.

ALASKA MARITIME NATIONAL WILDLIFE REFUGE
ALEUTIAN ISLANDS UNIT

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I. INTRODUCTION

This is the fourth consecutive season of a continuing effort to census and map all wildlife populations within the Aleutian Islands National Wildlife Refuge. Part of this effort is also directed towards establishing permanent population monitoring plots to determine trends of specific wildlife populations.

Work this season, as in past seasons, has been coupled with endangered species work on the Aleutian Canada geese in the western Aleutians. We conducted survey field work from 2 June until 17 July, then prepared for and conducted endangered species work.

Even though methods used in the 1980 survey were similar to those of past years, we did not have R/V Aleutian Tern support with the survey work. We conducted operations for all circumnavigation work (except Adak) out of a camp at Scripps Bay, Little Tanaga Island. We circumnavigated and surveyed with a 13' Zodiac inflatible boat and used a 21' Boston Whaler for support. We circumnavigated a total of 850 km this season compared to almost 480 in 1979, 160 in 1978, and 410 in 1977. The close proximity of all islands this summer to base camp, good weather and a cooperative crew were the main reasons for the large area covered.

Only results of this year's data are included in this report. Refer to individual reports from 1977 through 1979 for previous data.

Assistant Refuge Manager Tom Early was in charge, overall, of the survey work this season with Assitant Refuge Managers Kent Hall and Beverly Minn assisting.

This year, due to budget restraints, Young Adult Conservation Corps (YACC) personnel assisted with the work in lieu of GS-5 Biological Technicians. Jack Arnold, John Mueller, and Leslie Slater all did an outstanding job of assisting this year in these positions.

II. METHODS & MATERIALS

Refer to the 1979 summer report "Results of Bird and Mammal Surveys of the Western Aleutians" available in the AINWR files.

III ISLAND DESCRIPTIONS

Adak Island is irregular in shape and about 48 km long and 32 km wide. It is extremely mountainous, rugged and beautiful with many small bays and inlets. Mt. Moffet, at 1,170 meters high, is the island's highest point. Longshore currents have built spits and dikes that either partially or totally enclose three major lagoons from the sea. One of these lagoons, Clam Lagoon, which is open to the sea by a small inlet, is one of the most productive lagoons in the chain. In 1959, 24,400 hectares on the north half of the island were withdrawn for military purposes. Presently approximately 4,500 to 5,000 personnel are stationed at the Naval Base. The shoreline of Adak varies greatly with stretches of steep cliffs, boulder beaches, pebble and sand beaches. Adak Island has many offshore islets along its 340 km of shoreline. On the south side, the Elf Island complex is a fairly rugged set of grassy islands with a minimum of accessible beaches.

The Crone Island complex consists of rugged grass covered hills. On the west side of Adak numerous islets exist in the bay of Islands. Most are fairly steep and grassy and several have small inland lakes. There are many well protected bays extending deep into several of these islets.

Kagalaska Island is a very rugged and mountainous island 13 km long and 8 km wide. The highest peak on the island is 699 meters in elevation. Its' shores are, for the most part, steep and rocky, except on the west coast, where they have a more gradual slope. Several lakes and streams are found on the island. There is a moderate amount of accessible coastline mainly in the major coves and inlets and along portions of the western shoreline.

Little Tanaga Island is extremely irregular in form, very rocky and mountainous with the highest peak 524 meters. It is about 13 km long and 11 km wide. In general, the shores are steep and rocky. Several small lakes and streams are found on the island. Accessible shoreline from the island's interior is limited primarily to the sandy shore of Scripps Bay and small sections of Piper Cove, Chisak Bay, and Azamis Cove.

Umak Island is a mountainous, irregularly shaped island about 9.5 km long and 5 km wide with a deep bight indenting the northeast coast. The shores are steep and rocky with only occasional stretches of sand beach. Only about 15% of the island's shoreline is accessible from the island's interior.

Anagaksik Island is a precipitous rock about 1.6 km long, 0.8 km wide and 267 meters high. Along the north and east side soil and vegetation extend to the storm tide line which provides nesting habitat for burrow nesters. There is no accessible beach.

Aziak Island is 230 meters high, 0.8 km side, and 1.6 km long. It is rocky and hilly and vegetation covered. Only about 10% of the shoreline is accessible from the interior of the island.

Tanaklak Island is about 2.9 km long and 0.8 km wide and rocky and rugged. The island is of low relief with rolling hills extending to a height of 177 meters. The accessible beach area from the island's interior is about 10% of the total shoreline.

Asuksak Island is steep and rocky and consists mainly of one mountain 287 meters high. The island is about 1.1 km long and 0.8 km wide. On the northeast end of the island is a low grassy spit with a gravel beach on both sides. Accessible shoreline is only about 15% of the total.

Kanu Island, extending 317 meters in height is the largest of the small group of islands immediately south of Great Sitkin Island. The shoreline is steep and rocky except on the west side where there is a sand and gravel beach and a collapsed trapping cabin at the mouth of a small stream. From the island's interior, only about 10% of the beach is accessible.

Tagadak Island is very rugged and the shore is steep and rocky except for a portion of the northwest side which has a sandy beach. The highest point is 201 meters. Accessible shoreline is approximately 15% of the total.

Great Sitkin Island is about 16 km long and 13 km wide. The highest summit, 1,713 meters, is an active volcano which emits a small amount of steam. The last major eruption of ash occurred in 1973 and prior to that there were at least four recorded eruptions since 1972. The island has recently been blanketed in pumice and rock fragments ranging in depth from a few cntimeters to more than 6 meters (Sekora 1973). There are five small glaciers on the upper slopes. Much of the shoreline is steep and rocky but considerable stretches of sandy beach occur in several of the bays.

Ulak Island is a 1.6 km long by 0.3 km wide island with steep grassy slopes on the south side and sheer cliff faces on the north side. The highest point is 200 meters high.

Igitkin Island is divided into two parts connected by an isthmus about 0.5 km wide and elevated to just above storm-tide level. The island is about 8.8 km long and is mountainous and rocky

except for the isthmus. The coast is steep and rocky except for good beaches on both the north and south side of the isthmus. There was no cabin found on the isthmus as some charts indicate.

Chugul Island is 7.2 km long and 4 km wide. The highest summit is 500 meters and the coastline is generally steep and rocky. Only about 10% of the shoreline is accessible from the island's interior. The accessible beaches occur at the north bight and on the south bight of the east shoreline.

Tagalak Island is mountainous and about 5.1 km long by 4 km wide. The shoreline, in general, is steep and rocky with only two accessible beaches. One is located on the bight of the east shoreline near the south end and the other is a short length of sand beach on the north bight.

A series of small rocky islets extend east of Tagalak Island about 4.3 km. These are fairly steep and mostly rocky at the west end. extending up to 165 meters in elevation. The islets farther east in this series tend to be lower and more grassy knobs.

Fenimore Rock is about 67 meters high and 274 meters long. It is, for the most part, inaccessible and precipitous with steeper sides to the west.

Oglodak Island is about 2.1 km long and 1.1 km wide, extremely steep and mountainous. The shores are precipitous and rocky and, for the most part, inaccessible.

Kasatochi Island is an extinct volcanic crater rising to 311 meters with a fresh water lake in the crater caldera. The south and southwest sides consist of grassy slopes with a short length of sandy beach. The west and southwest sides are high rocky bluffs. The north side is more sheer. There is a cabin still standing on the west side. Most of the shoreline is accessible.

Ikiginak Island consists of an almost cone-shaped mountain 261 meters high. It is about 630 meters in diameter with steep and rocky shores. The island is very difficult to gain access to by boat due to its steep shores.

Table 1. Itinerary of events for the 1980 field season.

Date	Location and Activity	Personnel
3-8 June	Circumnavigate Adak	Early, Minn, Arnold, Mueller, Slater
21-23 June	Circumnavigate Kagalaska	Early, Hall, Arnold, Mueller, Slater
23-24 June	Circumnavigate Little Tanaga	Early, Hall, Arnold, Mueller
25 June	Circumnavigate Umak	Early, Hall, Mueller, Slater
26 June	Circumnavigate Aziak, Asuksak, Tanaklak, Box, Tagadak, and Kanu	Early, Hall, Mueller, Slater
29 June	Circumnavigate Igitkin and Ulak	Early, Minn, Mueller, Slater
2 July	Circumnavigate Chugul and Anagaksik	Early, Minn, Mueller, Slater
13 July	Circumnavigate Fenimore Rock, Ikiginak, Ogladak, and Kasatochi	Hall, Minn, Arnold, Mueller
14 July	Circumnavigate Tagalak, Establish Permanent Nest Plots on Ulak	Hall, Minn, Arnold, Mueller
15 July	Circumnavigate Great Sitkin	Hall, Minn, Arnold, Slater
16 July	On-shore investigations on Asuksak Tagadak and Kanu	Hall, Minn, Arnold, Slater
17 July	On-shore investigations on Aziak and Tanaklak, Establish Permanent Nest Plot on Aziak	Hall, Minn, Mueller, Slater
26 July	Tern leaves Seward for Adak, Conduct Pelagic Bird transects en route	Early, Emerson
8 August	Tern leaves Adak for Buldir and Aleutian Canada goose work, Conduct Pelagic Bird Transects en route	Early, Hall, Minn, Lee, Reiswig, Arnold, Brennan, Mueller, Slater
21 August	Left Buldir on Return trip to Adak, Aleutian Canada goose work completed, Conducted Pelagic Bird Transects en route	Early, Hall, Minn Lee, Reiswig, Arnold, Brennan, Mueller, Slater

IV Migratory Birds

A total of 42 species of migratory birds were observed during the circumnavigation/survey work conducted in 1980. An attempt was made to estimate, as accurately as possible, all but three of these species. The northern phalarope, rock sandpiper, and wandering tattler were observed on very few occasions and an estimate made from these observations would not be realistic.

Each island will be discussed separately because of the tendency for each island to contain separate identifiable breeding populations. Table 32 has been included for quick and easy comparison, summarizing the estimated populations of those birds observed on an island by island basis.

Adak Island (Table 2 and 3, Fig. 1)

Adak Island was the first island circumnavigated in 1980; from 3 to 8 June. In general good weather allowed for the 340 km to be surveyed in a relatively short time. While circumnavigating, surveyers stayed one night each at Hidden Bay, Chapel Cove, and Three-Arm-Bay, and two nights at Unalga Bight. Fuel was used from caches established previously at Hidden Bay, Chapel Cove, and Unalga Bight.

Adak doesn't contain large concentrations of sea birds or other waterfowl along its coast. The most abundant seabird observed was the tufted puffin, numbering approximately 1,350 individuals. The largest concentration of these and other alcids existed on the south side of Adak in the Crone Island complex. This area contained 72% of the total tufted puffins observed. Sekora (1973) also indicated a similar concentration of tufted puffins in the Crone Island complex, numbering about 1,800. However, additional concentrations were noted by Sekora in the Elf Island complex (1,500) and on Cape Yakak (500) that were not seen in the 1980 survey. Our survey found only two tufted puffins and 33 horned puffins in the Elf Island complex. The concentration of 700 horned puffins observed by Sekora in the Elf Island complex all but disappeared and that in the Crone Island complex dropped from 700 to 100 individuals.

Based on the circadian rhythms of these species it is not surprising that different counts were made by Sekora (1973) and during our survey. We hope to establish permanent monitoring plots on several of these islands to better estimate population changes. Nesting activity was most apparent in the Crone Island complex and on North Island in the Bay of Islands, although plots were never established to definitely confirm nesting.

Cormorants, both pelagic and red-faced, existed in variable concentrations along the entire shoreline. The only major concentration of nesting cormorants observed was located between Turret Point and Middle Point in the Bay of Waterfalls (Transect N-O). This area contained approximately 174 cormorants and 79 nests. North Island, in the Bay

of Islands, also contained a colony of 202 cormorants and 59 nests. In contrast, Sekora (1973) reported four distinct concentrations of pelagic and red-faced cormorants. These were located in: (1) the Elf Island complex, 750 pelagic, (2) Crone Island complex, 900 red-faced, (3) the shoreline just north of Turret Point in the Bay of Waterfalls, 800 pelagic and 300 red-faced and (4) the point just directly west of Head Rock, on the northwest side of Adak, 300 cormorant sp. Due to inherent nesting patterns of red-faced and pelagic cormorants, it is not surprising to find possible shifts in cormorant concentrations. Our survey found a total of 2,195 cormorants sp. compared to Sekora's estimated total of 3,050.

Pigeon guillemots were found scattered along the entire coastline. The highest counts were made in the Elf Island and Crone Island complexes. It is assumed nesting did occur although most observations were made of birds offshore and nests were never observed. Sekora (1973) indicated a colony of 500 pigeon guillemots in the Elf Island complex and one of 700 birds in Boot Point. Our survey found only 263 pigeon guillemots in the Elf Island complex and 69 at Boot Point. It is hard to speculate means for the differences between 1972 and 1980 populations. Population shifts, a major decline in numbers, or differences in time of year each survey was conducted may all be factors.

Glaucous-winged gulls were abundant around Adak. A large colony was discovered on North Island containing approximately 500 individuals and 100 to 150 nests. The establishment of several permanent plots are planned for this island next season (1981). Sekora reported a colony of 500 in the Crone Island complex, which was not observed during our survey. Immature gulls accounted for 38% of the total number counted and adults 62%.

Five Aleutian Canada geese were observed on North Island on 7 June. No evidence of nesting could be found even though the area was thoroughly searched.

Five peregrine falcons were observed on Adak. Four of these sightings occured on the south side of Adak in the Beyer Bay and False Bay area. Nesting could not be confirmed although cliff type habitat, preferred for nesting, was available and territorial behavior was often displayed. Sekora (1973) mentioned that peregrine aeries did exist on Adak, however, numbers and locations were not given. Observations of peregrines were often the results of audio contact. The running of outboard engines during the circumnavigation may have caused some peregrines to be overlooked.

Bald eagles are generally numerous on Adak. A total of 30 aeries were counted. Nine of these, or 30%, were located in the Kuluk Bay area along with fourteen adult and five immature eagles. Another high concentration was found in the Bay of Islands with five aeries. North Island, itself, had three aeries. Ten other adult and nine immature eagles were observed in the Bay of Islands area.

Remaining observations of eagles and aeries were spread out along the shoreline. The Naval Base landfill site may artificially inflate the bald eagle population on Adak, especially the concentration in the Kuluk Bay area. Higher concentrations in the Bay of Islands may result from the high amount of shoreline for scavenging and also relatively high waterfowl concentrations in that area.

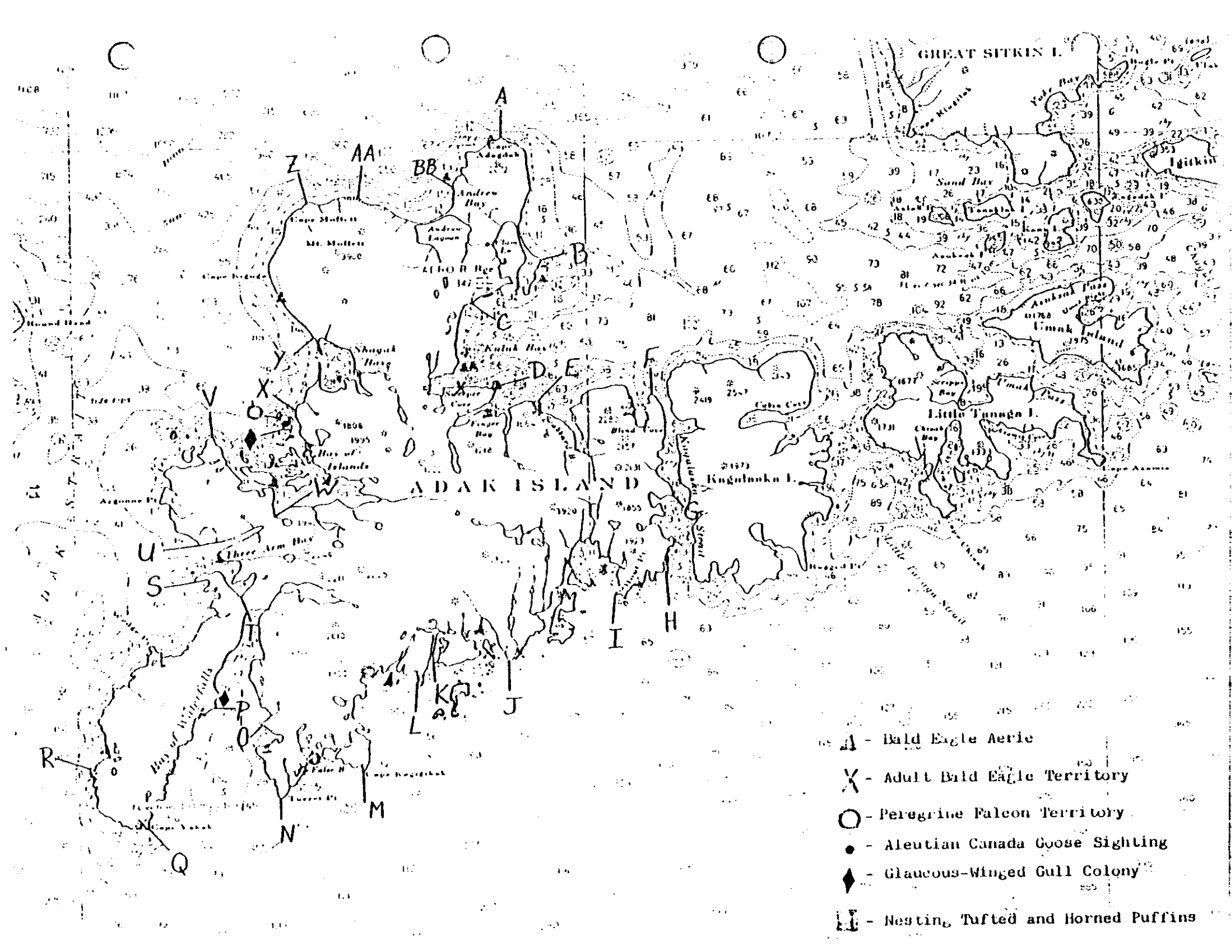
Table 2. Population Counts for Adak Island, June 3-8, 1980

Species	#Counted
Cormorant spp.	1853i
Cormorant spp.	14n
Pelagic Cormorant	210i
Pelagic Cormorant	93n
Red-faced Cormorant	132i
Red-faced Cormorant	55n
Murre spp.	48i
Thick-billed Murre	53i
Common Murre	53i
Pigeon Guillemot	1597i
Horned Puffin	422i
Tufted Puffin	1331i
Murrelet spp.	1i
Ancient Murrelet	330i
Kittlitz's Murrelet	4i
Marbled Murrelet	19i
Black Oystercatcher	54i
Glaucous-winged Gull (Adult)	940i
Glaucous-winged Gull (Immature)	573i
Glaucous Gull	1i
Black-headed Gull	1i
Parasitic Jaeger	2i
Tern spp.	2i
Arctic Tern	3i
Aleutian Tern	99i
Common Eider	595i
Harlequin	2395i
Eurasian Green-winged Teal	100i
Mallard	17i
Oldsquaw	1i
Shoveller	2i
White-winged Scoter	27i
Greater Scaup	23i
Red-breasted Merganser	246i
Common Loon	5i
Bald Eagle (Adult)	101i
Bald Eagle (Immature)	61i
Peregrine Falcon	5i
Common Reven	167i
Northern Phalarope	4i
Rock Sandpiper	1i
Wandering Tattler	1i

i = individual
n = nest

Table 3. Population Estimates for Adak Island, June 3-8, 1980.

Species		Estimate
Cormorant spp.	Non-breeders	1834i
Cormorant spp.		14pr
Pelagic Cormorant	Non-breeders	85i
Pelagic Cormorant		93pr
Red-faced Cormorant	Non-breeders	58i
Red-faced Cormorant		55pr
Murre spp.		48pr
Thick-billed Murre		53pr
Common Murre		53pr
Pigeon Guillemot		1756pr
Horned Puffin		1055pr
Tufted Puffin		3328pr
Murrelet spp.		1i
Ancient Murrelet		330i
Kittlitz's Murrelet		4i
Marbled Murrelet		19i
Black Oystercatcher		27pr
Glaucous-winged Gull	Non-breeders	573i
Glaucous-winged Gull		470pr
Glaucous Gull		1i
Black-headed Gull		1i
Parasitic Jaeger		2i
Tern spp.		2i
Arctic Tern		3i
Aleutian Tern		99i
Common Eider		625i
Harlequin		2450i
Eurasian Green-winged Teal		250i
Mallard		75i
Oldsquaw		1i
Shoveller		2i
White-winged Scoter		30i
Greater Scaup		35i
Red-breasted Merganser		260i
Common Loon		8i
Bald Eagle		48a
Bald Eagle (Total)		210i
Peregrine Falcon		5a
Peregrine Falcon (Total)		15i
Common Raven		200i


GREAT SITKIN I.
ADAK ISLAND
Kagalaska I.
Little Tanaga I.
Umak Island
A
B
C
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H
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U
V
W
X
Y
Z
AA
BB
- Bald Eagle Aerie
- Adult Bald Eagle Territory
- Peregrine Falcon Territory
- Aleutian Canada Goose Sighting
- Glaucous-Winged Gull Colony
- Nesting Tufted and Horned Puffins

Kagalaska Island (Tables 4 and 5, Fig. 2)

Kagalaska Island was the second island surveyed; between 21 and 23 June. Rain and fog kept us from surveying on 22 June. Observation conditions were generally good on 21 and 23 June.

The most abundant seabird observed was the pigeon guillemot. This species existed in fairly even numbers all along the coastline and, although no nests were observed, it is assumed that nesting did occur.

There were 75 cormorant nests found, 55% pelagic and 45% red-faced, on the north side of Kagalaska (Transect A-B). Four other nests were observed on the southwest side of the island (Transect E-F).

The only other species observed nesting were horned and tufted puffins. Although they were present in varying numbers all along the coastline, there was only one nesting concentration observed. Located on the north side of the island, it contained 170 birds, 62% horned puffins and 38% tufted puffins. Sekora (1973) observed no breeding concentrations of puffins or other seabirds during his survey of the island.

Five bald eagle aeries and one eagle territory were observed around Kagalaska. A total of 20 adult eagles were observed, of which 11 were associated with aeries or territories. The remainder were seen at various points but exhibited no territorial behavior. One peregrine falcon was observed in Quail Bay near Ragged Point (Transect F-G). Although no mate or definite aerie was observed it is quite probable that this bird was nesting on the island.

Table 4. Population Counts for Kagalaska Island, 21,22,23, June 1980.

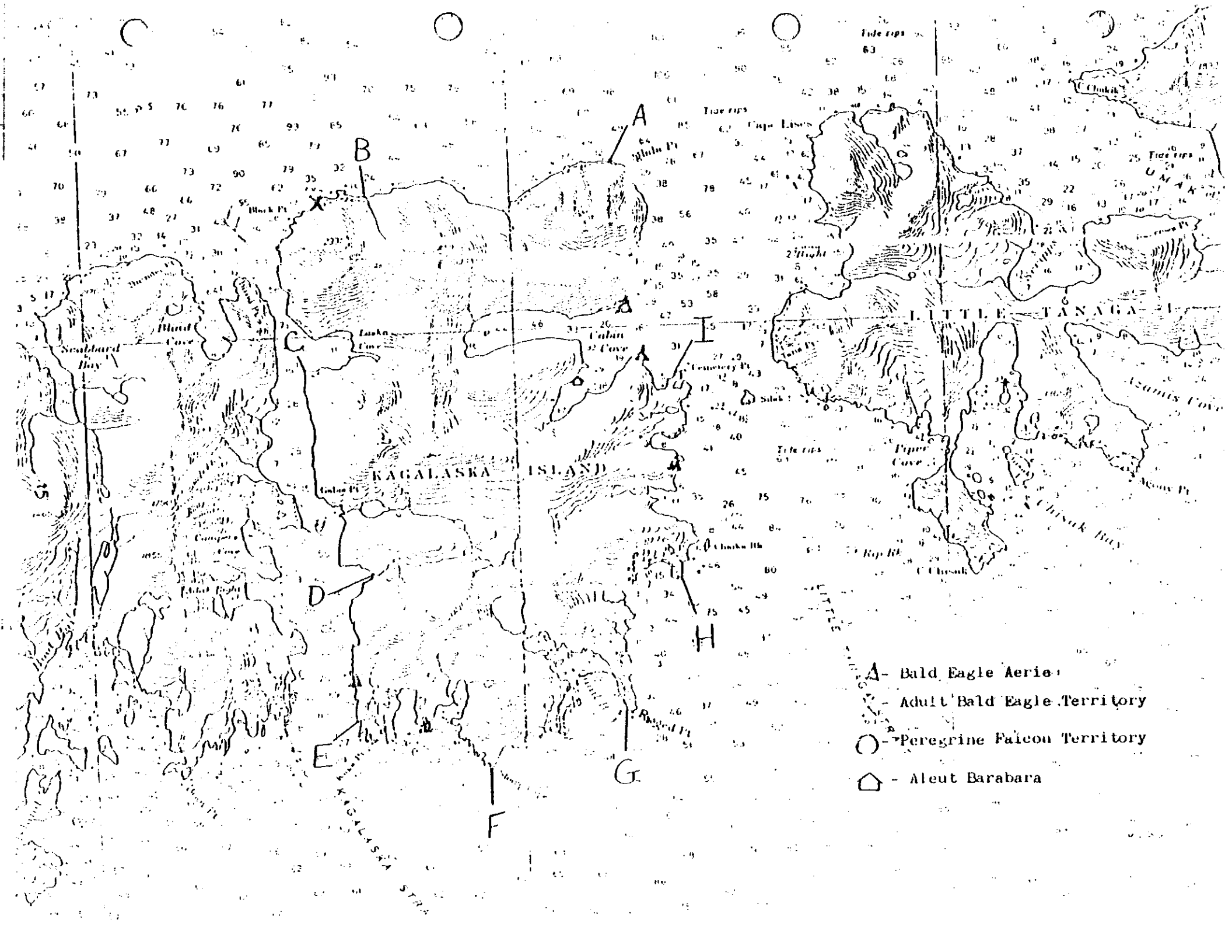
Species	# Counted
Cormorant spp.	289i
Pelagic Cormorant	85i
Pelagic Cormorant	47n
Red-faced Cormorant	47i
Red-faced Cormorant	32n
Murre spp.	19i
Pigeon Guillemot	473i
Horned Puffin	300i
Tufted Puffin	122i
Ancient Murrelet	32i
Glaucous-winged Gull (Adult)	218i
Glaucous-winged Gull (Immature)	12i
Common Eider (either sex)	17i
Common Eider (Male)	18i
Common Eider (Female)	23i
Harlequin (either sex)	142i
Harlequin (Male)	14i
Harlequin (Female)	31i
Eurasian Green-winged Teal	25i
Red-breasted Mergansers	4i
Black Oystercatcher	14i
Bald Eagle (Adult)	20i
Bald Eagle (Immature)	9i
Peregrine Falcon	1i

i = individuals
n = nests

Table 5. Population Estimates for Kagalaska Island, 21-23 June 1980.

Species		Estimate
Cormorant spp.	Non-breeders	289i
Pelagic Cormorant	Non-breeders	22i
Pelagic Cormorant		47pr
Red-faced Cormorant	Non-breeders	4i
Red-faced Cormorant		32pr
Murre spp.		19pr
Pigeon Guillemot		520pr
Horned Puffin		750pr
Tufted Puffin		305pr
Ancient Murrelet		32i
Glaucous-winged Gull		109pr
Glaucous-winged Gull	Non-breeders	12i
Common Eider		75i
Harlequin		300i
Eurasian Green-winged Teal		40i
Red-breasted Merganser		8i
Black Oystercatcher		7pr
Bald Eagle		6a
Bald Eagle (Total)		35i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i

i = individual
pr = breeding pair
a = aerie


A
B
C
D
E
F
G
H
I
KAGALASKA ISLAND
LITTLE TANAGA
A - Bald Eagle Aerie
- Adult Bald Eagle Territory
- Peregrine Falcon Territory
- Aleut Barabara

Little Tanaga Island (Tables 6 and 7, Fig. 3)

Little Tanaga was surveyed on 23 and 24 June. We encountered no problems during the survey; the weather and the seas both co-operated to make for excellent observing conditions. Silak Island was included as a part of Little Tanaga Island. Refer to the field notes in Appendix 1 for a data breakdown.

Once again the most abundant seabird observed on Little Tanaga was the pigeon guillemot. A total of 440 individuals of this species were observed in varying numbers all along the coast of the island. Again, it is assumed to be nesting along the island's shoreline even though no nests were observed during the survey. Beach transects will be established in the near future to monitor this nesting species.

Several small concentrations of both pelagic and red-faced cormorants were observed in various places along the coast. The largest concentration was located on the southeast end of the island (Transect E-F) near Cape Azamis. A total of 34 nests were observed, of which 38% were red-faced comorant nests and 47% were pelagic cormorant nests. The remaining 15% were unknown cormorant species. Other concentrations observed were located near Tana Point (Transect A-B), 3 nests; Cape Chisak, 13 nests; Chisak Bay near Cape Chisak, 1 nest; Round Cove near Cape Azamis, 6 nests; and 2 nests near Tana Bight on the west side of the island. Three nests were also observed on Silak Island. Sekora's (1973) only observation of nesting cormorants on the island was located on the north side of Azamis Cove where he noted a total of 300 individuals. These birds were not present during the 1980 survey. There appeared to be ample unoccupied cormorant nesting habitat available.

A concentration of 200 horned puffins were noted in Chisak Bay and Azamis Cove. Although no nests were observed it is quite probable that both horned and tufted puffins were nesting on the offshore islands in Chisak Bay.

Parakeet, whiskered and crested auklets were observed offshore near the south side of the island and near Silak Island. There were a number of scattered auklets seen feeding in the island passes. We are confident that they are not breeding on Little Tanaga.

Two bald eagles and four territorial adults were observed indicating six probable aeries along the coastline. One other adult, which was not included as a territorial unit, a sub-adult and an immature were also observed during the survey; the adult in transect E-F near Elbow Point and the other two in Chisak Bay (Transect C-D). It is quite possible that the adult which was not associated with a territory was, in fact, the mate of one of the territorial birds but away from the territory at the time of the sighting.

Eight peregrine falcon territories containing a total of nine individuals were observed during the survey. Although no nest sites were

identified it is believed that this species is nesting on the island as preferred nesting habitat was abundant on the island.

Four permanent inland migratory bird transects were established in the interior of Little Tanaga during the survey to monitor for passerine bird species, rock sandpipers, and rock ptarmigan. These transects were run several times during the survey to develop an index of species diversity and abundance on the island. This information will be used for an analysis of migratory and upland game bird populations in a possible fox eradication project on Little Tanaga.

Table 6. Population Counts for Little Tanage Island, June 23,24, 1980.

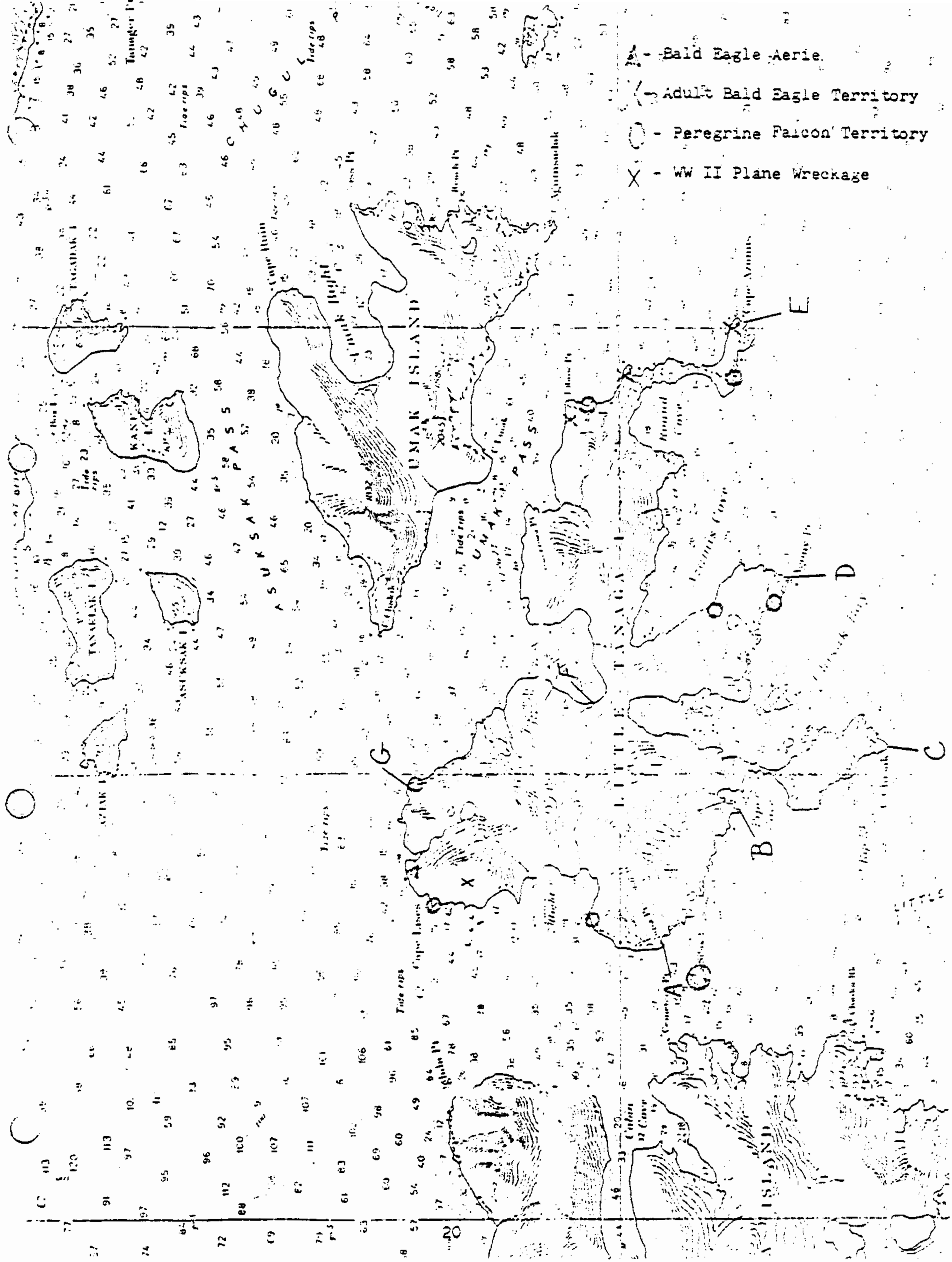
Speicies	# Counted
Cormorant spp.	267i
Cormorant spp.	11n
Pelagic Cormorant	48i
Pelagic Cormorant	38n
Red-faced Cormorant	13i
Red-faced Cormorant	13n
Murre spp.	28i
Common Murre	76i
Pigeion Guillemot	442i
Horned Puffin	297i
Tufted Puffin	68i
Ancient Murrelet	22i
Parakeet Auklet	6i
Whiskered Auklet	4i
Crested Auklet	20i
Mallard	2i
Glaucous-winged Gull (Adult)	290i
Glaucous-winged Gull (Immature)	37i
Common Eider (either sex)	18i
Common Eider (Male)	44i
Common Eider (Female)	27i
Harlequin	195i
Eurasian Green-winged Teal	3i
Red-breasted Merganser	7i
Bald Eagle (Adult)	8i
Bald Eagle (Sub Adult)	1i
Bald Eagle (Immature)	1i
Black Oystercatcher	28i
Common Raven	3i
Peregrine Falcon	9i

i = individual
n = nests

Table 7. Population Estimates for Little Tanaga Island, 23-24 June, 1980.

Species		Estimate
Cormorant spp.	Non-breeders	252i
Cormorant spp.		11pr
Pelagic Cormorant		38pr
Red-faced Cormorant		13pr
Murre spp.		28pr
Common Murre		76pr
Pigeon Guillemot		486pr
Horned Puffin		743pr
Tufted Puffin		158pr
Ancient Murrelet		22i
Parakeet Auklet		6i
Whiskered Auklet		4i
Crested Auklet		20i
Glaucous-winged Gull		145pr
Glaucous-winged Gull	Non-breeders	37i
Common Eider		100i
Harlequin		200i
Mallard		5i
Eurasian Green-winged Teal		6i
Red-breasted Merganser		10i
Bald Eagle		6a
Bald Eagle (Total)		20i
Black Oystercatcher		14pr
Common Raven		3i
Peregrine Falcon		8a
Peregrine Falcon (Total)		24i

i = individual
pr = breeding pair
a = aerie



- Bald Eagle Aerie
- Adult Bald Eagle Territory
- Peregrine Falcon Territory
X - WW II Plane Wreckage
UMAK ISLAND
ASUKSAK PASS
UMAK PASS
LITTLE TANAGA
ISLAND
KANE
TANAKAK I
ASUKSAK I
TAGADAK I
A
B
C
D
E
G
20

Umak Island (Tables 8 and 9, Fig. 4)

Umak Island was circumnavigated on 25 June. Observing conditions were good and no problems were encountered except for some rough seas around Cape Agumsadak. Tide rips made it necessary to survey that area from the Boston Whaler.

The most numerous seabird observed during the survey was the glaucous-winged gull, with 214 adult and 52 immature birds being observed. The majority of these birds, especially the concentration of 124 in transect B-C, were in Asuksak Pass feeding. For this reason and the lack of any land-based concentrations it is believed that this species is not nesting on Umak Island.

A total of 120 cormorants, 110 of which could not be identified to species, were observed during the survey. These birds existed in varying numbers along most of the coastline. The largest number occurred on the southeast side of the island (Transect F-A) totalling 81 birds, however, only 11 nests, 10 red-faced and 1 cormorant species were seen along the entire coastline. Sekora (1973) reported one colony of 300 nesting cormorants at Cape Ruin and Moss Point, on the northeast side of the island. This colony was not present during the 1980 survey. It may be that there was either a dramatic shift in the nesting location or the birds seen by Sekora were not nesting.

A total of 14 common murres were also observed nesting near Cape Agumsadak on the southwest side of the island, and a total of 26 birds were observed along the entire coastline.

A total of 106 pigeon guillemots were observed and were fairly evenly distributed along the coast of Umak Island. Although no nests were actually observed, this species is assumed to be nesting on the island.

One whiskered auklet was observed feeding in the waters of Chugul Pass, however, it was most likely a visitor from another island, as large rafts of auklets and also puffins were often seen feeding in the tide rips of most of the passes in the Andreanofs.

Two bald eagles aeries, each with one adult, and one territorial adult were observed during the survey. It is, therefore, believed that three aeries were present on the island at the time of the survey. One of the aeries also contained a fledgling. Three other adult and two immature eagles were also observed during the survey but were not included as territorial units. One peregrine falcon was observed and although no definite aerie was seen it is believed to have been nesting on the island because of the adjacent cliff-type habitat.

A permanent beach survey was established on the beach just northwest

of Cape Umak (Transect F-A) on 1 July 1981. A total of four song sparrows and 4 winter wrens were observed on the survey of that beach. Refer to figure 25 for the transect location. Two permanent inland migratory bird transects were also established on 1 July in the same area (Fig. 25). Each was run only once, but plans include re-surveying each to develop trends in both migratory and upland game bird populations.

Table 8. Population Counts for Umak Island, 25 June, 1980.

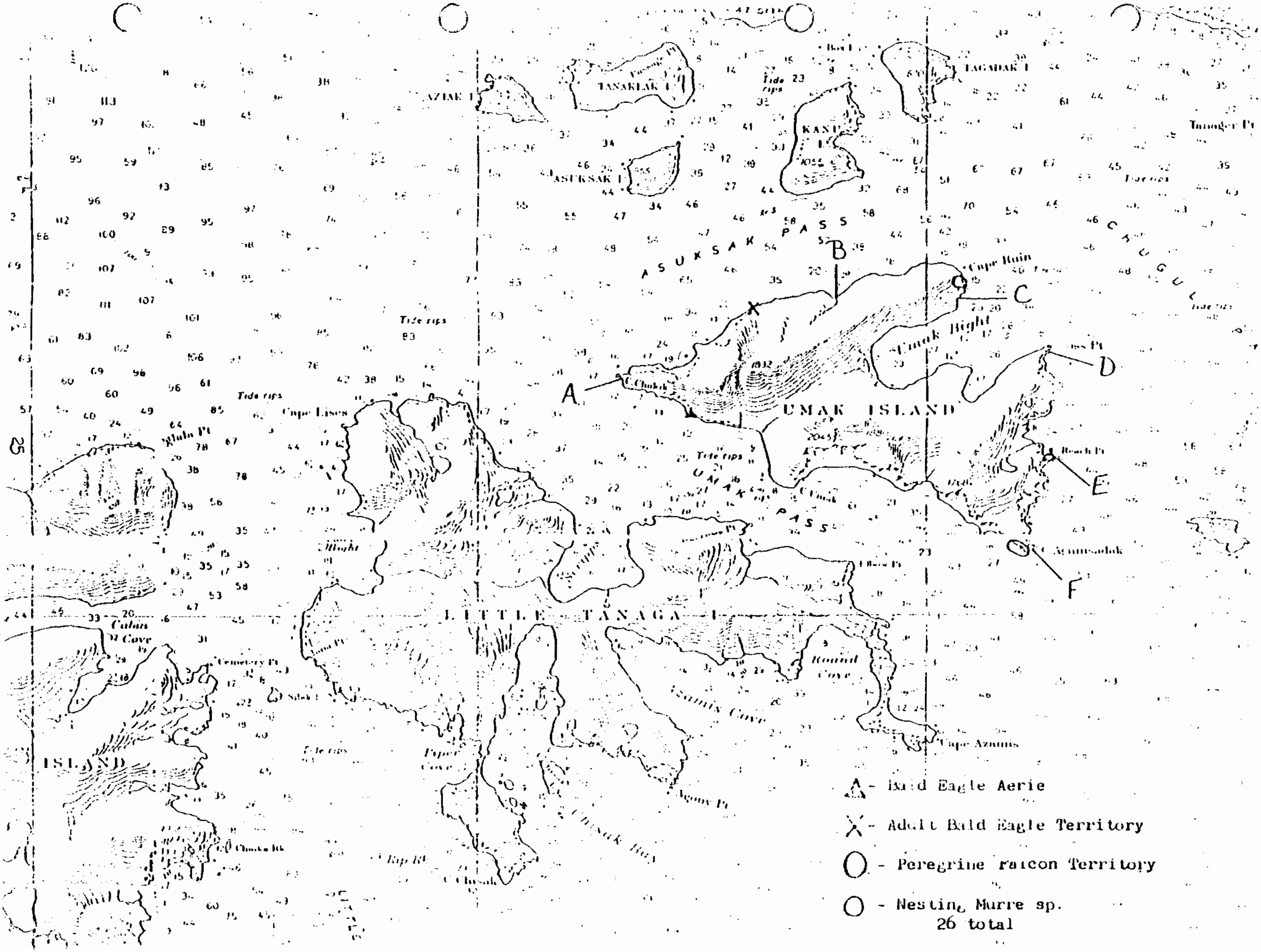
Species	# Counted
Cormorant spp.	111i
Cormorant spp.	1n
Red-faced Cormorant	10i
Red-faced Cormorant	10n
Black-legged Kittiwake	4i
Murre spp.	12i
Common Murre	14i
Common Murre	14n
Pigeon Guillemot	106i
Horned Puffins	56i
Tufted Puffin	38i
Ancient Murrelet	10i
Crested Auklet	1i
Whiskered Auklet	1i
Black Oystercatcher	2i
Glaucous-winged Gull (Adult)	214i
Glaucous-winged Gull (Immature)	51i
Common Eider (Male)	35i
Common Eider (Female)	28i
Harlequin	39i
Eurasian Green-winged Teal	8i
Common Raven	2i
Bald Eagle (Adult)	3i
Bald Eagle (Immature)	2i
Peregrine Falcon	1i

i = individual
n = nests

Table 9. Population Estimates for Umak Island, 25 June, 1980.

Species		Estimate
Cormorant spp.	Non-breeders	110i
Cormorant spp.		1pr
Red-faced Cormorant		10pr
Black-legged Kittiwake		4i
Murre spp.		12pr
Common Murre		14pr
Pigeon Guillemot		117pr
Horned Puffins		140pr
Tufted Puffins		95pr
Ancient Murrelet		10i
Crested Auklet		1i
Whiskered Auklet		1i
Black Oystercatcher		1pr
Glaucous-winged Gull		107pr
Glaucous-winged Gull	Non-breeders	51i
Common Eider		70i
Harlequin		45i
Eurasian Green-winged Teal		10i
Common Raven		2i
Bald Eagle		3a
Bald Eagle (Total)		20i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i

i = individual
pr = breeding pair
a = aerie



UMAK ISLAND
LITTLE TANAGA I
ISLAND
ASUKSAK PASS
UMAK PASS
TANAKLAK I
TAGADAK I
KANU I
ASUKSAK I
Cape Lisica
Cape Azamis
Round Cove
Tide rips
Beach Pt
Cape Hain
A
B
C
D
E
F
A - Bald Eagle Aerie
X - Adult Bald Eagle Territory
O - Peregrine Falcon Territory
O - Nesting Murre sp.
26 total

Six islands were circumnavigated on 26 June 1980: Aziak, Asuksak, Tanaklak, Tagadak, Kanu, and Box Islands. Observation conditions were excellent and no problems were encountered during the surveying of these islands.

Aziak Island (Tables 10 and 11, Fig. 5)

A total of 127 tufted puffins and 58 horned puffins were observed on Aziak Island during the survey. An on-shore investigation and nesting plot study was done on 17 July, but no puffin nests were observed in the plot. Puffins were seen flying overhead on both occasions and were assumed to be nesting on the island. A total of 86 parakeet auklets were observed during the survey and on 17 July they were again observed and believed to be nesting in the rocks near sea level on the southwest side. During the nesting study two common eider nests, two ancient murrelet nests and several fork-tailed petrel nests were also observed on the island. Fifty pigeon guillemots were observed and assumed to be nesting on Aziak. About 25 glaucous-winged gull adults were observed and could have quite possibly been nesting on the island. More intensive land surveys are planned for the 1981 field season. One territorial adult bald eagle was also observed and assumed to be nesting on Aziak.

Asuksak Island (Tables 10 and 11, Fig. 5)

Approximately 50 horned and 35 tufted puffins were observed during the circumnavigation of Asuksak. During an on-shore investigation conducted on 16 July, confirmation of nesting puffins was made when two burrows were found on the south side of the island. Twenty-three pigeon guillemots were observed during the survey and were assumed to be nesting along the coast. Only 13 parakeet auklets were observed during the survey, but during the on-shore investigation were observed nesting in the boulders along the coastline. A total of 68 glaucous-winged gull adults were observed during the survey and it is quite possible that they were nesting on the island. During the on-shore investigation of 16 July 1 common eider nest and two ancient murrelet burrows were found and fork-tailed petrels were heard but none were observed. Three territorial adult bald eagles, two of which were an obvious pair were observed and assumed to be nesting on the island. One immature eagle was also observed. One peregrine falcon was observed on the south side of the island and was assumed to be nesting there. More intensive ground surveys on this and the other islands in this group are planned for the 1981 field season.

Tanaklak Island (Tables 10 and 11, Fig. 5)

The pigeon guillemot was the most numerous bird observed on Tanaklak, with 66 birds being observed. These were assumed to be nesting on

the island. Only seven horned puffins were observed during the survey and the on-shore investigation conducted on 17 July found no burrows of any kind. Two adult bald eagles were observed on the north side of the island, however, no territorial behavior was exhibited by either. It was, therefore, assumed that none were nesting on the island. One peregrine falcon was observed on the west side and assumed to be nesting there. A more intensive ground survey of this island is planned for 1981.

Box Island (Tables 10 and 11, Fig. 6)

Box Island is an off-shore rock about 15 m x 15 m in area. Very few birds were observed on the island and none were thought to be nesting on it.

Tagadak Island (Tables 10 and 11, Fig. 6)

The pigeon guillemot was the most numerous bird observed during the survey with 80 birds seen. This species was assumed to be nesting on the island. Approximately 60 puffins, both horned and tufted, were observed during the survey, but the on-shore investigation conducted on 16 July could not confirm any nesting by this species. Petrel egg-shell fragments were found, however, and it appeared that at least a limited amount of preferred puffin burrowing habitat was present in several places on the island. 1981 field season plans include a more intensive survey of this island for nesting birds. A total of 79 glaucous-winged gull adults were observed around Tagadak, but nesting was not confirmed. Again, a more intensive survey of this island is planned to determine the extent of nesting by this species on the island. One adult bald eagle and one peregrine falcon were observed on the island and both were assumed to be nesting there.

Kanu Island (Tables 10 and 11, Fig. 6)

A total of 82 pigeon guillemots were observed along the coast of Kanu and were assumed to be nesting there. Although only 19 horned and tufted puffins were observed during the survey, it is believed that they were nesting on the island, even if only in small numbers. During the on-shore investigation conducted on 16 July one fork-tailed petrel was found confirming the presence of ground nesting birds. Two territorial adult bald eagles were also observed on the island and were assumed to be nesting there. 1981 field season plans include a more intensive survey of this island to determine the extent of nesting by the various ground nesting birds on the island.

Table 10. Population Counts for Aziak, Asuksak, Tanaklak, Box, Tagadak and Kanu Islands, 26 June 1980.

Species	# Counted
Aziak	
Cormorant spp.	43i
Murre spp.	12i
Pigeon Guillemot	50i
Horned Puffin	58i
Tufted Puffin	127i
Parakeet Auklet	86i
Crested Auklet	11i
Black Oystercatcher	1i
Glaucous-winged Gull (Adult)	26i
Glaucous-winged Gull (Immature)	1i
Common Eider (Male)	12i
Common Eider (Female)	10i
Bald Eagle (Adult)	1i
Asuksak	
Cormorant spp.	17i
Pigeon Guillemot	23i
Horned Puffin	47i
Tufted Puffin	36i
Parakeet Auklet	13i
Glaucous-winged Gull (Adult)	68i
Glaucous-winged Gull (Immature)	1i
Common Raven	1i
Common Eider (Male)	12i
Common Eider (Female)	4i
Bald Eagle (Adult)	3i
Bald Eagle (Immature)	1i
Peregrine Falcon	1i
Tanaklak	
Cormorant spp.	21i
Pelagic Cormorant	3i
Pigeon Guillemot	66i
Horned Puffin	7i
Black Oystercatcher	6i
Glaucous-winged Gull (Adult)	19i
Common Eider (Male)	18i
Common Eider (Female)	6i
Bald Eagle (Adult)	2i
Peregrine Falcon	1i
Rock Sandpiper	4i

Species	# Counted
Box	
Cormorant spp.	2i
Pigeon Guillemot	1i
Horned Puffin	6i
Tufted Puffin	3i
Glaucous-winged Gull (Immature)	1i
Tagadak	
Cormorant spp.	18i
Cormorant spp.	6n
Pelagic Cormorant	7i
Pelagic Cormorant	3n
Red-faced Cormorant	10i
Pigeon Guillemot	80i
Horned Puffin	20i
Tufted Puffin	39i
Black Oystercatcher	4i
Glaucous-winged Gull (Adult)	79i
Glaucous-winged Gull (Immature)	14i
Common Eider (Male)	13i
Common Eider (Female)	5i
Common Eider (Either sex)	7i
Bald Eagle (Adult)	1i
Peregrine Falcon	1i
Kanu	
Cormorant spp.	4i
Pelagic Cormorant	3i
Pigeon Guillemot	82i
Horned Puffin	14i
Tufted Puffin	5i
Black Oystercatcher	7i
Glaucous-winged Gull (Adult)	16i
Common Eider (Male)	7i
Common Eider (Female)	12i
Bald Eagle (Adult)	2i

i = individual
n = nests

Table 11. Population Estimates for Aziak, Asuksak, Tanaklak, Box, Tagadak and Kanu Islands, 26 June 1980.

Species	Aziak	Estimate
Cormorant spp.	Non-breeders	43i
Murre spp.	Non-breeders	12i
Pigeon Guillemot		55pr
Horned Puffin		145pr
Tufted Puffin		318pr
Parakeet Auklet		86pr
Crested Auklet		11i
Black Oystercatcher		1pr
Glaucous-winged Gull		13pr
Glaucous-winged Gull	Non-breeders	1i
Common Eider		30i
Bald Eagle		1a
Bald Eagle (Total)		3i
	Asuksak	
Cormorant spp.	Non-breeders	17i
Pigeon Guillemot		25pr
Horned Puffin		118pr
Tufted Puffin		90pr
Parakeet Auklet		20pr
Glaucous-winged Gull		34pr
Glaucous-winged Gull	Non-breeders	1i
Common Raven		1i
Common Eider		25i
Bald Eagle		2a
Bald Eagle (Total)		7i
Peregrine Falcon		1a
Peregrine Falcon		3i
	Tanaklak	
Cormorant spp.	Non-breeders	21i
Pelagic Cormorant	Non-breeders	3i
Pigeon Guillemot		73pr
Horned Puffin		7i
Black Oystercatcher		3pr
Glaucous-winged Gull		10pr
Common Eider	Partial Breeders	30i
Bald Eagle (Total)		2i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i

Box

Cormorant spp.	Non-breeders	2i
Pigeon Guillemot		1i
Horned Puffin		6i
Tufted Puffin		3i
Glaucous-winged Gull	Non-breeders	1i

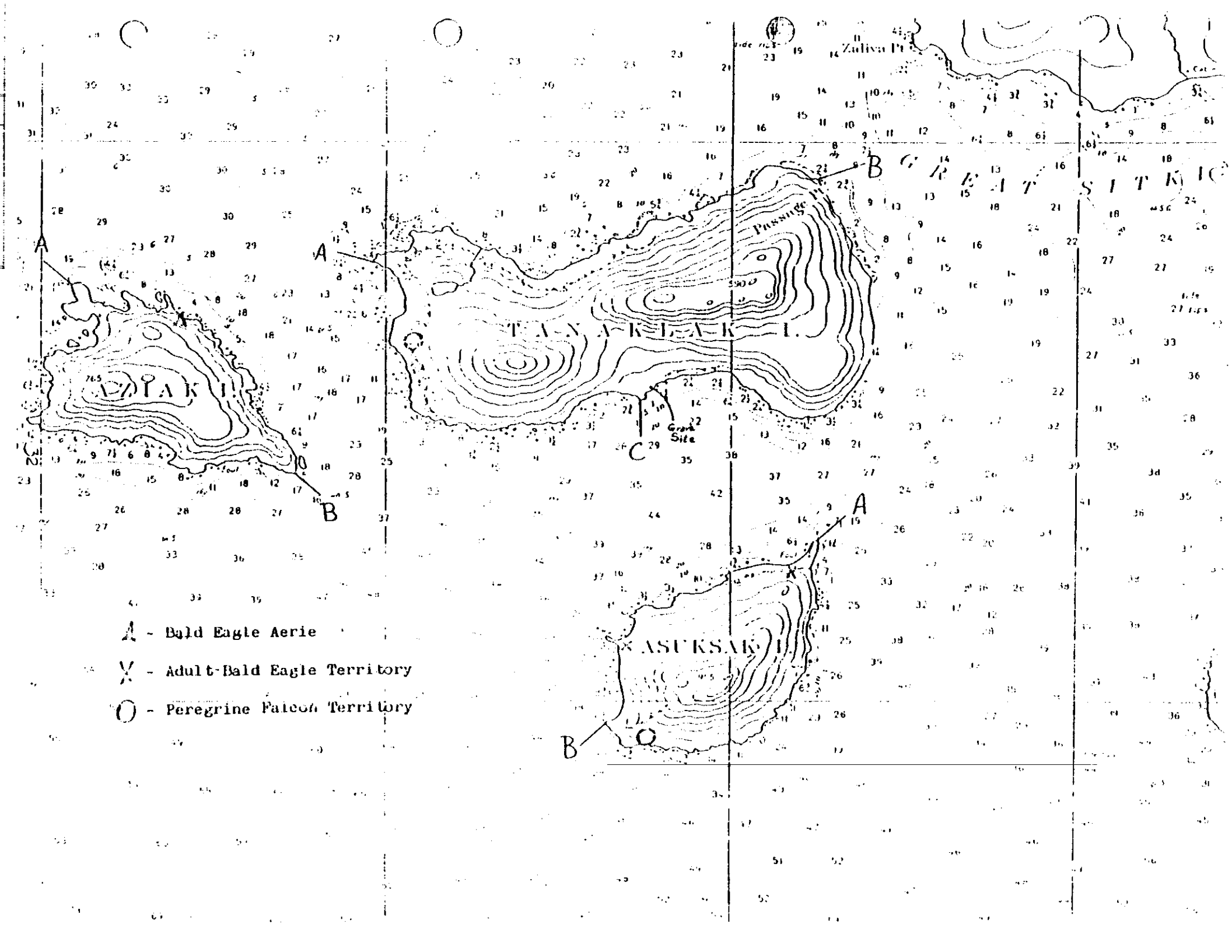
Tagadak

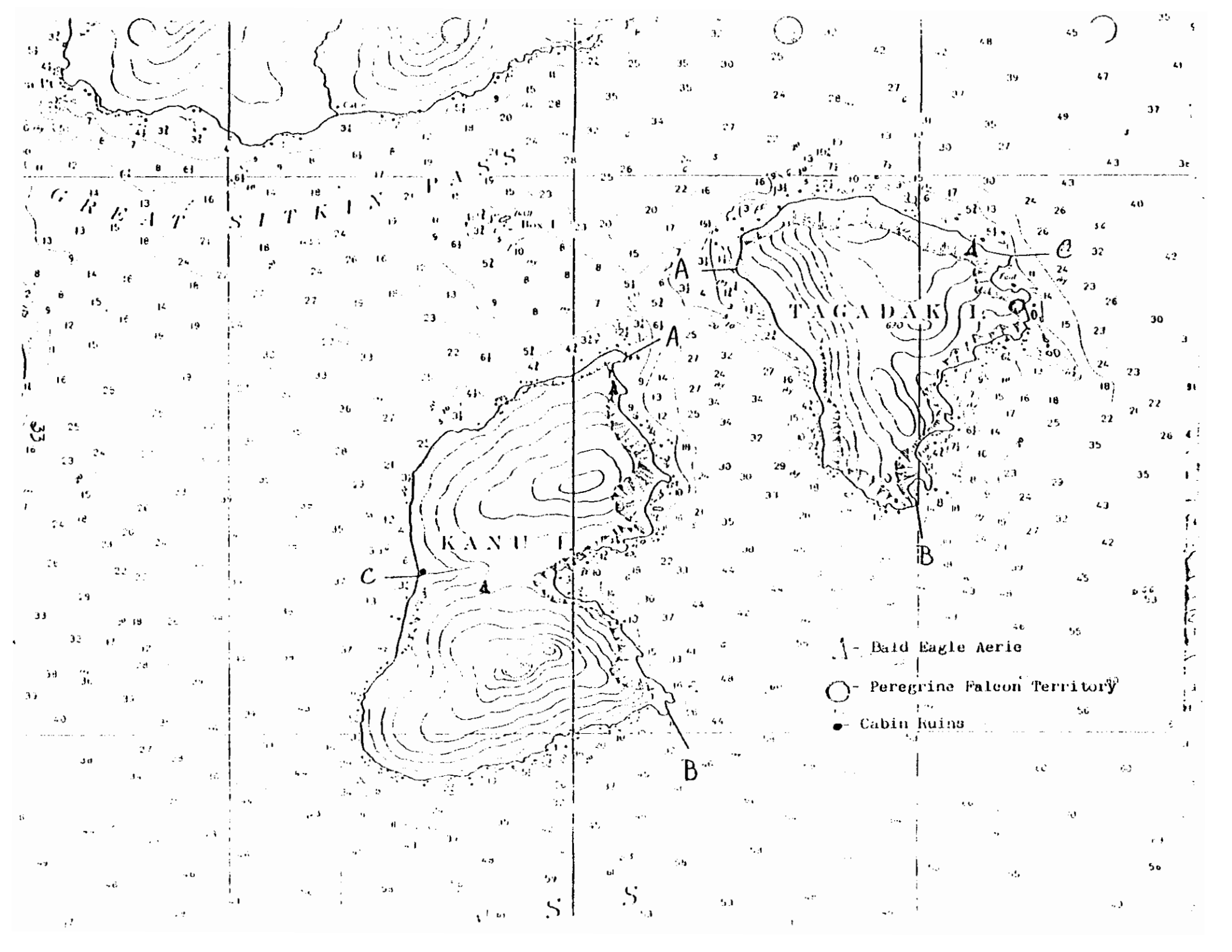
Cormorant spp.	Non-breeders	14i
Cormorant spp.		6pr
Pelagic Cormorant	Non-breeders	3i
Pelagic Cormorant		3pr
Red-faced Cormorant	Non-breeders	10i
Pigeon Guillemot		88pr
Horned Puffin		50pr
Tufted Puffin		98pr
Black Oystercatcher		2pr
Glaucous-winged Gull		40pr
Glaucous-winged Gull	Non-breeders	14i
Common Eider	Partial Breeders	35i
Bald Eagle		1a
Bald Eagle (Total)		3i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i

Kanu

Cormorant spp.	Non-breeders	4i
Pelagic Cormorant	Non-breeders	3i
Pigeon Guillemot		90pr
Horned Puffin		35pr
Tufted Puffin		13pr
Black Oystercatcher		4pr
Glaucous-winged Gull		8pr
Common Eider	Partial Breeders	25i
Bald Eagle		2a
Bald Eagle (Total)		6i

i = individual
pr = breeding pair
a = aerie


A
B
C
Passage
Grave Site
A - Bald Eagle Aerie
X - Adult-Bald Eagle Territory
O - Peregrine Falcon Territory


GREAT SITKIN PASS
TAGADAK I.
KANAGA I.
A
B
C
- Bald Eagle Aerie
- Peregrine Falcon Territory
- Cabin Ruins

Both Igitkin and Ulak Islands were circumnavigated on 29 June 1980. No problems were encountered and the weather cooperated to make observation conditions excellent.

Igitkin Island (Tables 12 and 13, Fig. 7)

A total of 215 pelagic and red-faced cormorants were observed along the coast of Igitkin, however, no rookeries were found. This is consistent with Sekora's (1973) survey of the island. It is quite probable that these birds were feeding in the passes around the island and may nest on Ulak Island. The most abundant seabird species observed was the pigeon guillemot, with 212 individuals observed. The distribution of this species around Igitkin was fairly uneven and it may be nesting there. About 200 puffins, 70% of which were horned puffins, were observed in unevenly distributed numbers in the water along the coast. It is doubtful that they were nesting on the island as fox were found to exist there. It is possible that they were from Ulak Island, where a large nesting population of puffins existed. An on-shore investigation of the Shelter Cove/ Igitkin Bight area revealed one Eurasian green-winged teal nest with five eggs.

Three bald eagle aeries, one of which contained a fledgling, and one immature eagle were also observed on the island and peregrine falcon was observed and was assumed to be nesting.

Table 12. Population Counts for Igitkin Island, 29 June 1980.

Species	# Counted
Cormorant spp.	189i
Pelagic Cormorant	25i
Red-faced Cormorant	5i
Murre spp.	3i
Pigeon Guillemot	212i
Horned Puffin	141i
Tufted Puffin	61i
Ancient Murrelet	1i
Black Oystercatcher	1i
Glaucous-winged Gull (Adult)	46i
Glaucous-winged Gull (Immature)	1i
Common Eider (Male)	59i
Common Eider (Female)	27i
Harlequin	119i
Eurasian green-winged teal	9i
Bald Eagle (Adult)	3i
Bald Eagle (Immature)	1i
Bald Eagle (Fledgling)	1i
Peregrine Falcon	1i
Common Raven	2i
Rock Sandpiper	5i

i = individual
n = nests

Table 13. Population Estimates for Igitkin Island, 29 June 1980.

Species		Estimate
Cormorant spp.	Non-breeders	189i
Pelagic Cormorant	Non-breeders	25i
Red-faced Cormorant	Non-breeders	5i
Murre spp.		3i
Pigeon Guillemot		233pr
Horned Puffin		353pr
Tufted Puffin		153pr
Ancient Murrelet		1i
Black Oystercatcher		1pr
Glaucous-winged Gull		23pr
Glaucous-winged Gull	Non-breeders	1i
Common Eider		65i
Harlequin		125i
Eurasian Green-winged Teal		12i
Bald Eagle		3a
Bald Eagle (Total)		10i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i
Common Raven		2i

i = individual
pr = breeding pair
a = aerie

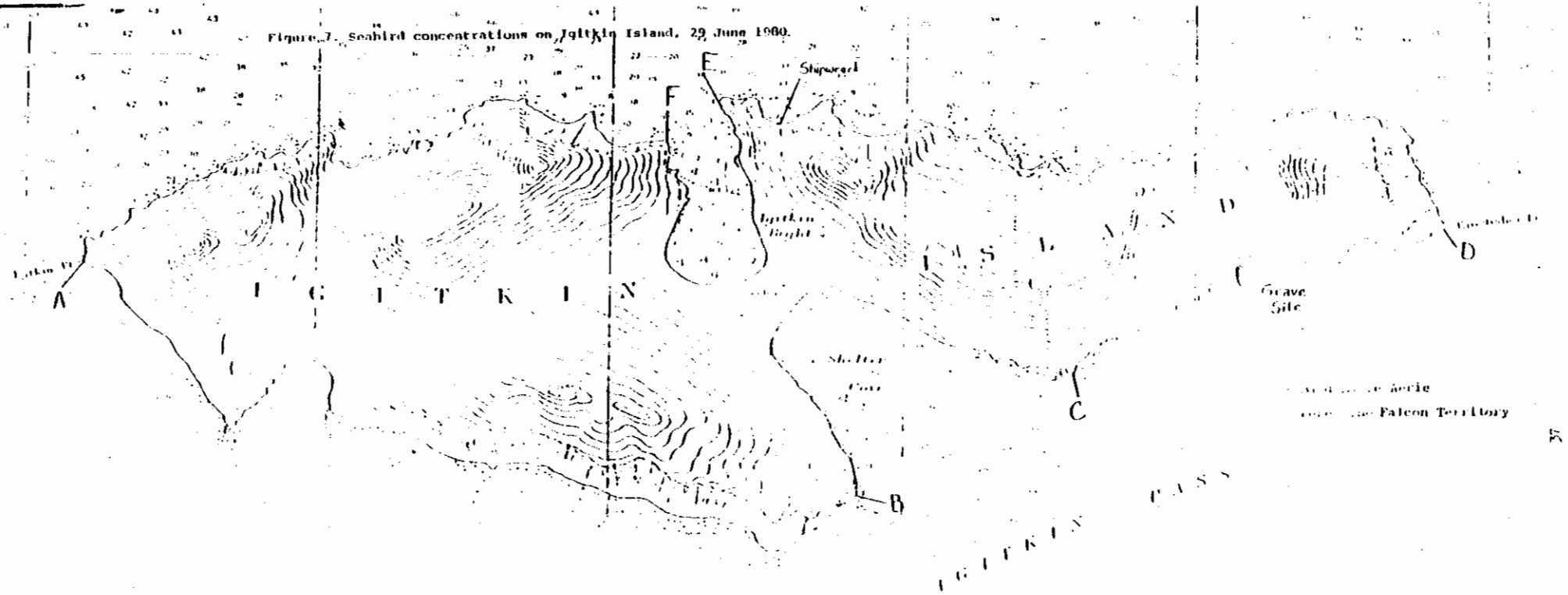


Figure 7. Seabird concentrations on Igiltkin Island, 29 June 1980.

Ulak Island (Tables 14 and 15, Fig. 8)

A total of 193 cormorants were observed during the circumnavigation of Ulak Island. The majority were located in a large rookery on the northwest side of the island. A total of 127 nests, 91% of which were red-faced, were also observed. Sekora (1973) noted a nesting population of 800 red-faced cormorants on Ulak.

A colony of 1,200 common murres was observed mainly on the northwest side of the island. This is fairly consistent with Sekora's (1973) report. About 550 puffins, 85% horned, were also observed and assumed to be nesting on the island. Sekora reported a population of 20,000 tufted puffins on Ulak. He also noted a population of 3,000 parakeet auklets, whereas during the 1980 survey we only observed two. During an on-shore investigation of the island on 14 July, approximately 100 to 150 parakeet auklets were seen swimming just off-shore on the southeast side of the island and were heard in the rocks along the shore. These could not, however, be positively identified. As a result it is believed that the survey on 29 June underestimated the population of parakeet auklets on Ulak. Still, it is not believed that 3,000 auklets were in residence at the time of the survey.

One bald eagle aerie with two adult eagles in attendance and one peregrine falcon were seen during the survey. The peregrine falcon was assumed to be nesting because of its territorial behavior even though no definite aerie was found.

Table 14. Population Counts for Ulak Island, 29 June 1980.

Species	# Counted
Cormorant spp.	15i
Cormorant spp.	10n
Pelagic Cormorant	2i
Pelagic Cormorant	2n
Red-faced Cormorant	176i
Red-faced Cormorant	115n
Common Murre	1195i
Pigeon Guillemot	20i
Horned Puffin	469i
Tufted Puffin	91i
Parakeet Auklet	2i
Common Raven	2i
Glaucous-winged Gull (Adult)	64i
Glaucous-winged Gull (Immature)	9i
Common Eider (Male)	10i
Common Eider (Female)	7i
Harlequin	22i
Bald Eagle (Adult)	2i
Peregrine Falcon	1i

i = individual
n = nests

Table 15. Population Estimates for Ulak Island, 29 June 1980.

Species		Estimate
Cormorant spp.	Non-breeders	2i
Cormorant spp.		10pr
Pelagic Cormorant		2pr
Red-faced Cormorant	Non-breeders	22i
Red-faced Cormorant		115pr
Common Murre		1195pr
Pigeon Guillemot		22pr
Horned Puffin		1173pr
Tufted Puffin		228pr
Parakeet Auklet		2i
Common Raven		2i
Glaucous-winged Gull		32pr
Glaucous-winged Gull	Non-breeders	9i
Common Eider	Partial Breeders	25i
Harlequin		30i
Bald Eagle		1a
Bald Eagle (Total)		3i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i

i = individual
pr = breeding pair
a = aerie

△ - Bald Eagle Territory

○ - Peregrine Falcon Territory

— — - Nesting; Murre sp. and Cormorant sp.

Chugul Island (Tables 16 and 17, Fig. 9)

Chugul Island was circumnavigated on 2 July 1980. Although the cloud ceiling was only about 100 meters when surveying the northwest corner of the island (Transect A-F), it did not significantly reduce visibility and hence limit observations. A total of 230 pigeon guillemots were observed in relatively evenly distributed numbers all around the island and was the most numerous seabird observed. Although no nests were observed, it was assumed to be nesting on the island. Approximately 250 horned and tufted puffins were observed around the island, with 75% being observed on the southwest side. Forty percent of these were horned and the remainder tufted. It is possible that a few of these birds were nesting on Chugul, but more than likely these birds came from Tagalak Island where an estimated population of 1,500 puffins exist.

A total of 119 glaucous-winged gulls were observed in unevenly distributed numbers all around the island, but were not thought to be nesting there.

Three adult bald eagles, one showing territorial behavior, were sighted during circumnavigation. One peregrine falcon was also observed and it, too, was assumed to be nesting.

Table 16. Population Counts for Chugul Island, 2 July 1980.

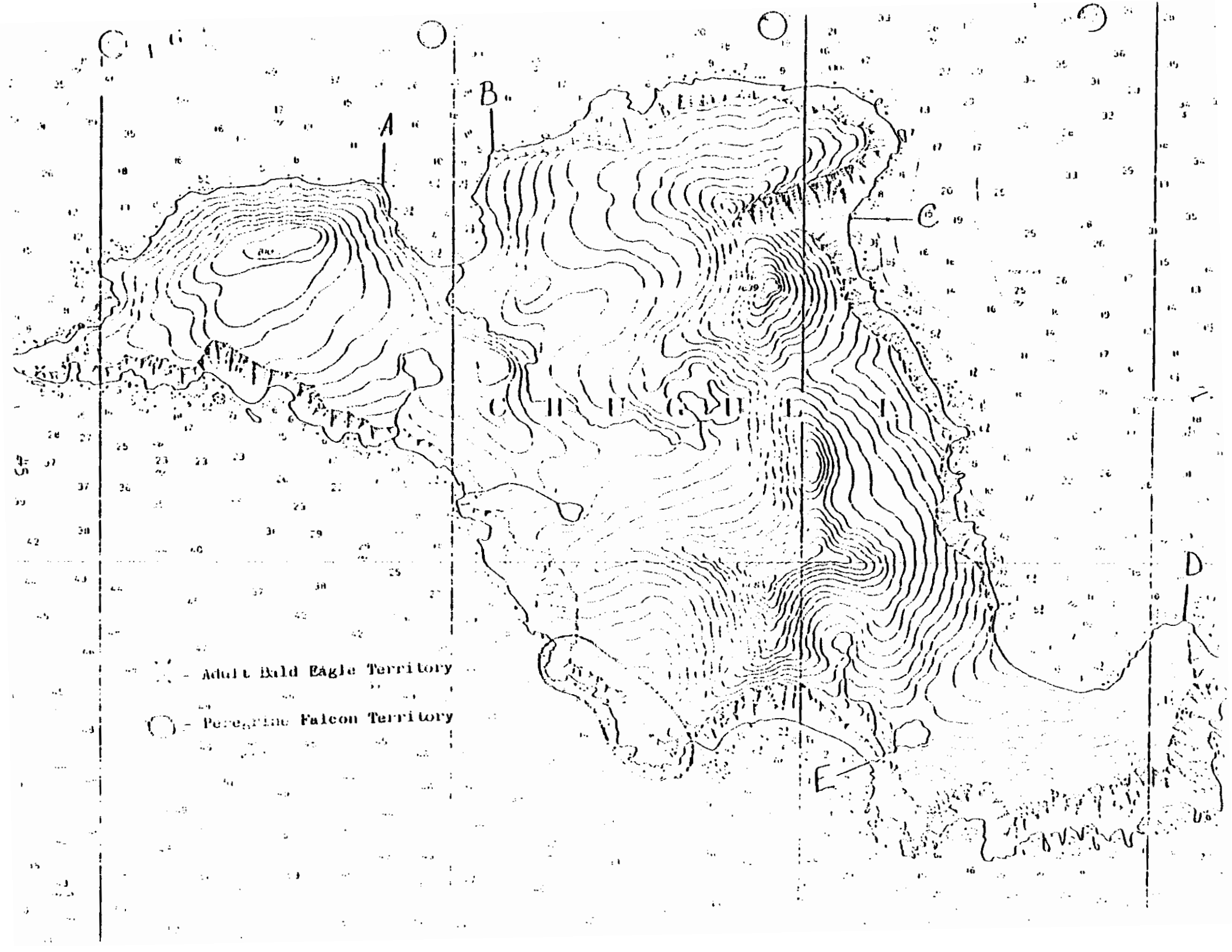
Species	# Counted
Cormorant spp.	93i
Pelagic Cormorant	88i
Pelagic Cormorant	13n
Red-faced Cormorant	6i
Murre spp.	49i
Pigeon Guillemot	230i
Horned Puffin	99i
Tufted Puffin	146i
Black Oystercatcher	5i
Whiskered Auklet	1i
Glaucous-winged Gull (Adult)	119i
Glaucous-winged Gull (Immature)	26i
Common Eider (Male)	16i
Common Eider (Female)	12i
Harlequin	50i
Bald Eagle (Adult)	3i
Peregrine Falcon	1i
Common Raven	5i

i = individual
n = nests

Table 17. Population Estimates for Chugul Island, 2 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	93i
Pelagic Cormorant	Non-breeders	71i
Pelagic Cormorant		13pr
Red-faced Cormorant	Non-breeders	6i
Murre spp.		49pr
Pigeon Guillemot		253pr
Horned Puffin		248pr
Tufted Puffin		365pr
Black Oystercatcher		3pr
Whiskered Auklet		1i
Glaucous-winged Gull		60pr
Glaucous-winged Gull	Non-breeders	26i
Common Eider		35i
Harlequin		65i
Bald Eagle		1a
Bald Eagle (Total)		4i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i
Common Raven		5i

i = individual
pr = breeding pair
a = aerie


A
B
C
D
E
- Adult Bald Eagle Territory
- Peregrine Falcon Territory

Anagaksik Island (Tables 18 and 19, Fig. 10)

Anagaksik Island was also circumnavigated on 2 July 1980. No problems were encountered during the survey; the weather co-operated fairly well. The most numerous seabird seen was the tufted puffin, with an observed population of about 250. Horned puffins, totalling 150, were also seen. Both species appeared to be nesting on the island, mainly on the north side, although no definite burrows were located. The island was considered for a permanent nesting plot, but was not chosen because of the inability to get ashore at any point around the island. Approximately 125 adult glaucous-winged gulls were observed on the south side of the island. No nests were observed, but it is assumed that they were nesting on the island. Sekora (1973) noted populations of approximately 6,400 horned and tufted puffins and 4,200 pigeon guillemots nesting on Anagaksik. Only 14 pigeon guillemots were observed during the 1980 survey. One peregrine falcon was also observed on the island and although no aerie was actually sighted, it is assumed to have been nesting on the island.

Table 18. Population Counts for Anagaksik Island, 2 July 1980.

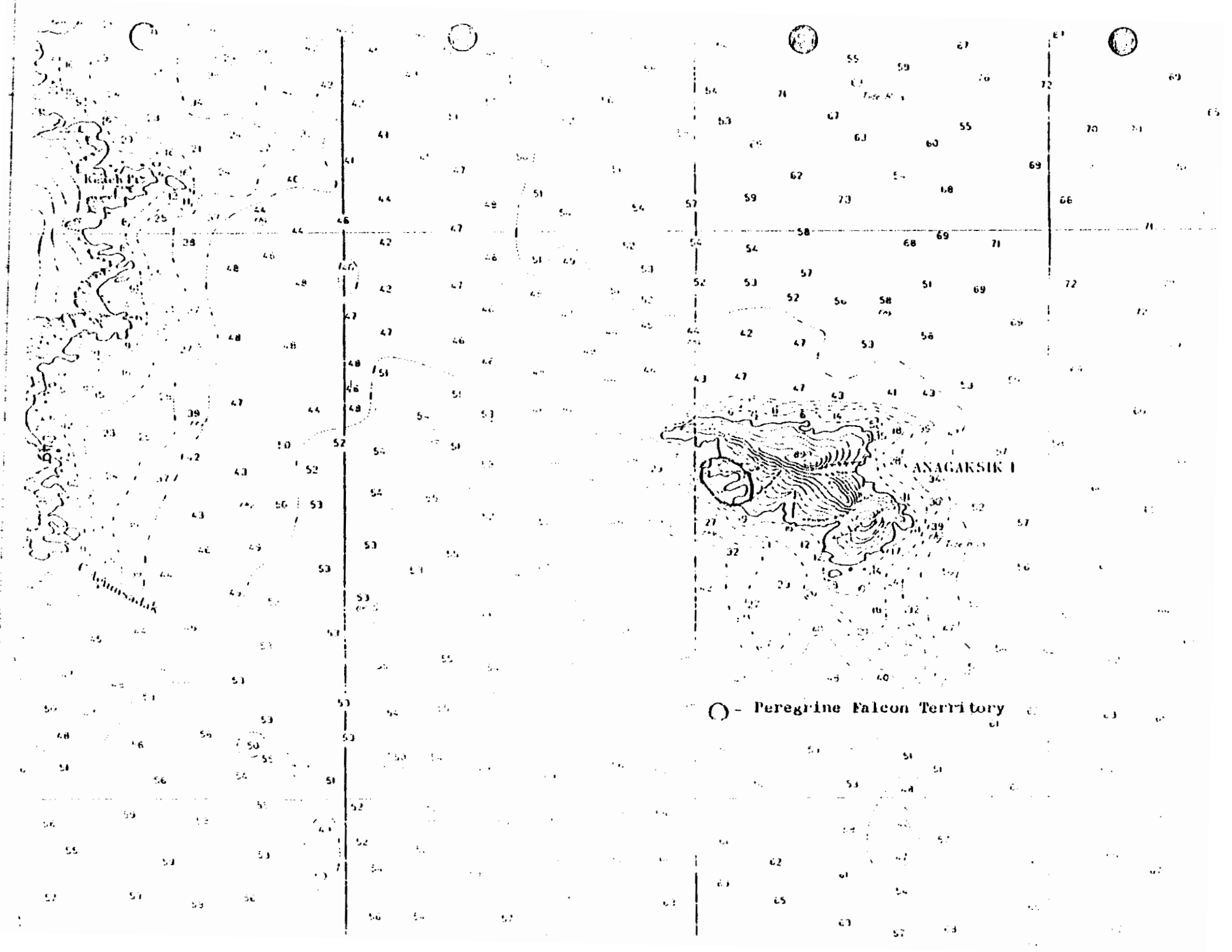
Species	# Counted
Cormorant spp.	30i
Pelagic Cormorant	4i
Murre spp.	35i
Pigeon Guillemot	14i
Horned Puffin	154i
Tufted Puffin	241i
Parakeet Auklet	1i
Common Raven	1i
Glaucous-winged Gull (Adult)	124i
Common Eider (Male)	1i
Harlequin	4i
Peregrine Falcon	1i

i = individual
n = nests

Table 19. Population Estimates for Anagaksik Island, 2 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	30i
Pelagic Cormorant	Non-breeders	4i
Murre spp.		35i
Pigeon Guillemot		15pr
Horned Puffin		385pr
Tufted Puffin		603pr
Parakeet Auklet		1i
Common Raven		1i
Glaucous-winged Gull		62pr
Common Eider		2i
Harlequin		5i
Peregrine Falcon		1a
Peregrine Falcon (Total		3i

i = individual
pr = breeding pair
a = aerie


Kuuk Pt.
ANAGAKSIK I
○ - Peregrine Falcon Territory

Fenimore Rock, Ikiginak, and Oglodak were circumnavigated on 13 July. Due to the long distance of these islands from base camp only the 21' Whaler was used for circumnavigation. Observation may have been hindered slightly without the use of the Zodiac. General observation conditions were excellent.

Fenimore Rock (Tables 20 and 21, Fig. 11)

The small size of Fenimore Rock is not condusive for use by high concentrations of nesting seabirds, however two species were found nesting. Approximately 55 tufted puffins were counted on and around Fenimore Rock. It is assumed that they were nesting in a grassy sloped area on the northern tip of the island. Murres were also nesting on Fenimore Rock. Approximately 17 adults and 14 nests were present on the Northwest side.

Cormorants were the most numerous seabird around Fenimore Rock, however, nesting was not evident. Cormorants counted here were more than likely members of the large colony existing on Ikiginak and Oglodak Islands.

Table 20. Population Counts for Fenimore Rock, 13 July 1980.

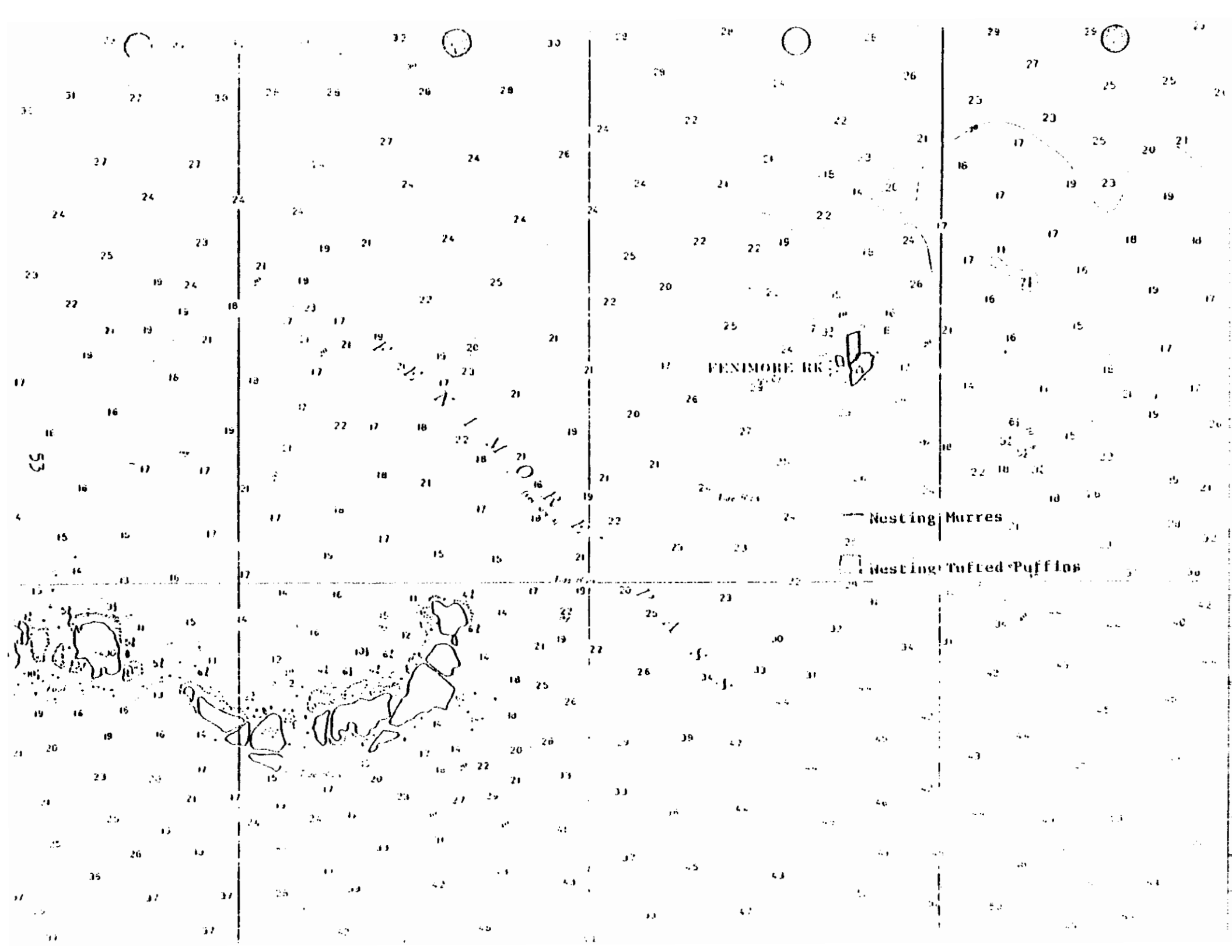
Species	#Counted
Cormorant spp.	62i
Murre spp.	17i
Murre spp.	14n
Tufted Puffin	55i
Glaucous-winged Gull (Adult)	17i
Glaucous-winged Gull (Immature)	9i

i = individual
n = nest

Table 21. Population Estimates for Fenimore Rock, 13 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	62i
Murre spp.		17pr
Tufted Puffin		138pr
Glaucous-winged Gull		9pr
Glaucous-winged Gull	Non-breeders	9i

i = individual
pr = breeding pair


FENIMORE RK
Nesting Murres
Nesting Tufted Puffins

Ikiginak Island (Tables 22 and 23, Fig. 12)

Approximately 480 horned and tufted puffins were counted on and around Ikiginak Island. They were observed flying and in the grassy slopes and were therefore assumed to be nesting there. Sekora (1973) did not record tufted puffins nesting on Ikiginak.

Murres were nesting on the southeast shoreline of Ikiginak. Approximately 43 murres were counted. This figure may be low due to our inability to get closer to shore, however, nesting was definitely confirmed.

Cormorants were found nesting only on the south side of the island. Approximately 256 individuals and 15 nests were counted. Again, some nests may have been overlooked because we were unable to get close to the shore.

Table 22. Population Counts for Ikiginak Island, 13 July 1980.

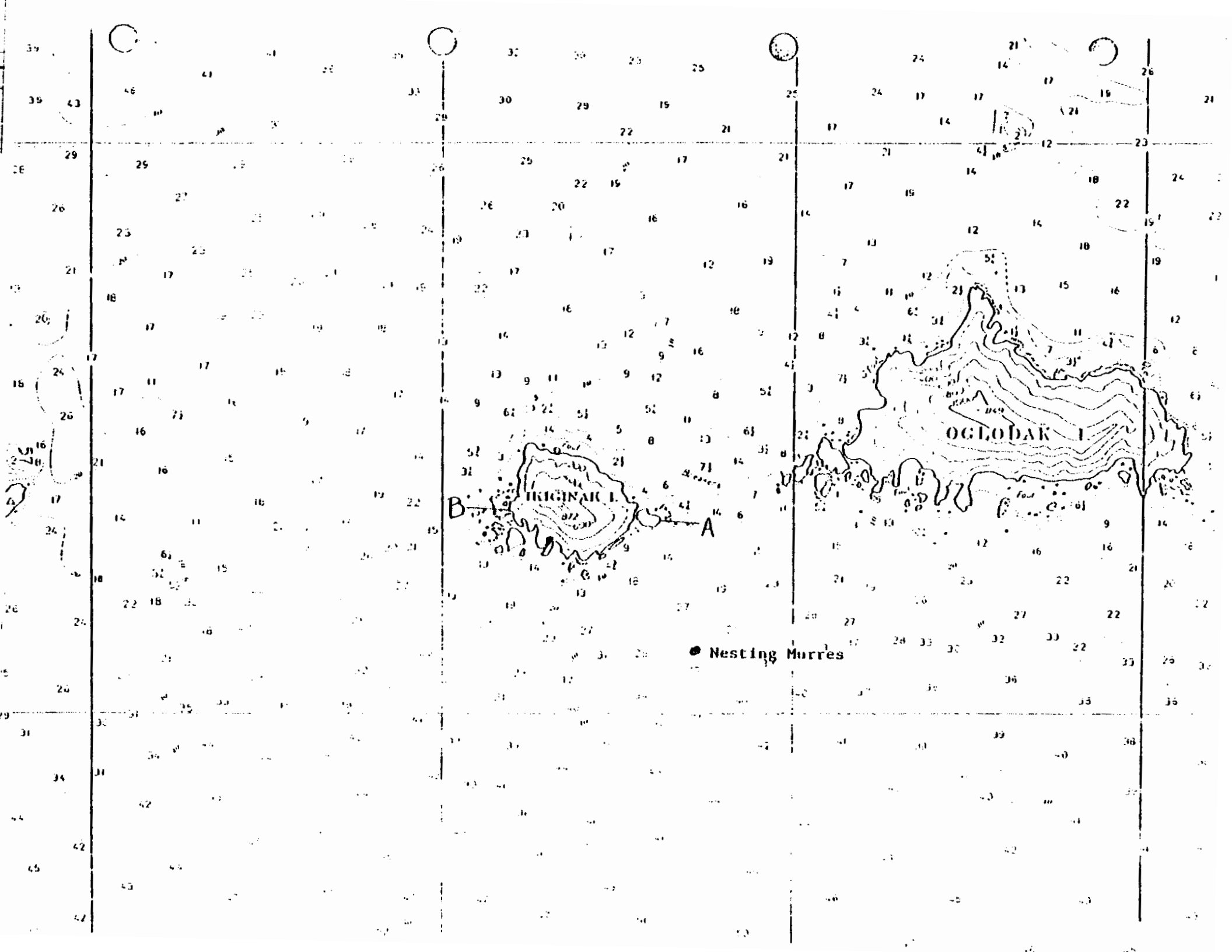
Species	#Counted
Cormorant spp.	256i
Cormorant spp.	15n
Murre spp.	53i
Pigeon Guillemot	42i
Horned Puffin	50i
Tufted Puffin	430i
Parakeet Auklet	2i
Black Oystercatcher	4i
Glaucous-winged Gull (Adult)	11i
Harlequin	2i

i = individual
n = nest

Table 23. Population Estimates for Ikiginak Island, 13 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	236i
Cormorant spp.		15pr
Murre spp.		53pr
Pigeon Guillemot		46pr
Horned Puffin		125pr
Tufted Puffin		1075pr
Parakeet Auklet		2i
Black Oystercatcher		2pr
Glaucous-winged Gull		6pr
Harlequin		4i

i = individual
pr = breeding pair


IKIGNAK I.
OGLODAK I.
B
A
Nesting Murres

Oglodak Island (Tables 24 and 25, Fig. 13)

Oglodak Island also contained several species of nesting seabirds. Most nesting birds were concentrated on the Eastern side of the island.

A colony of approximately 190 cormorants with 40 nests was located on the south east corner of Oglodak. The number of individual red-faced and pelagic cormorants could not be determined. A second smaller colony was located on the western half of the island. The colony contained only 12 nests and 9 individuals were counted.

Horned and tufted puffins were the most numerous seabird nesting on Oglodak. Approximately 735 tufted puffins and 35 horned puffins were counted during circumnavigation. The majority of the tufted puffins were concentrated along the southern shoreline. Birds were counted both flying over-head and in the grassy slopes. Horned puffins were slightly more numerous on the south side of Oglodak.

Parakeet auklets were sighted in the waters surrounding Oglodak and Ikiginak. We did not find nesting activity on either of the two islands. In contrast, Sekora (1973) reported a colony of 50,000 auklets nesting on Oglodak and Ikiginak. We did not find any evidence that such high concentrations ever existed in this area. Auklet nesting habitat virtually does not exist on these islands. Perhaps Sekora saw many auklets feeding in the passes near the islands and incorrectly assumed them to be nesting on the island. Murie (1937) reported large numbers of crested Auklets feeding in the passes between Tagalak and Ikiginak Island. He stated, based on their knowledge of auklet nesting areas in this area of the Aleutians, that the swarms of auklets seen in these waters must have come from Kasotochi or Koniuju Islands, which are 16 km to the north.

Murres were relatively abundant around Oglodak. Approximately 110 were counted on the east side of the island both in the water and on the cliffs and ledges. For this reason it is assumed that they were nesting on the island.

One bald eagle aerie was located on the northeast corner of Oglodak and three adult eagles were seen in the area.

Table 24. Population Counts for Oglodak Island, 13 July 1980

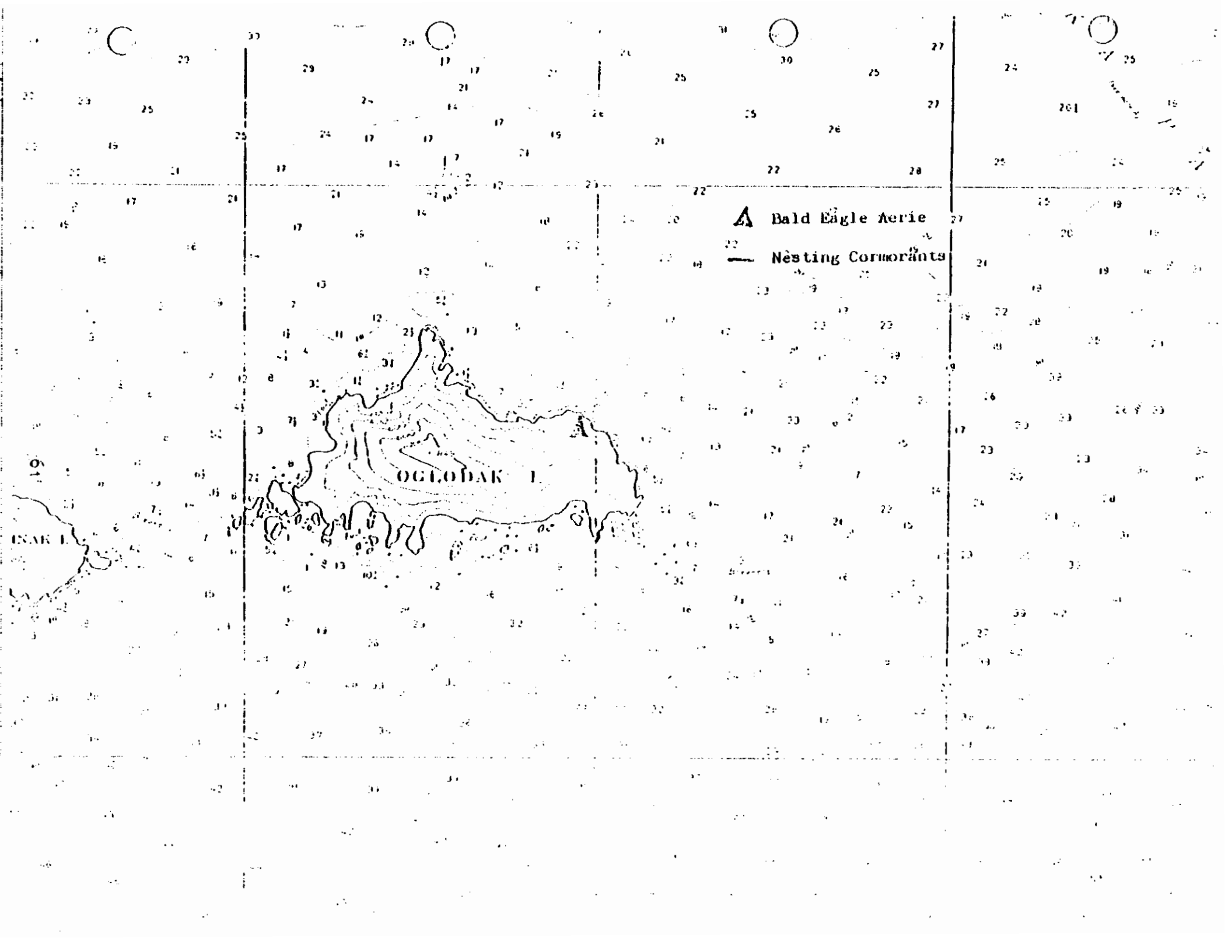
Species	#Counted
Cormorant spp.	199i
Cormorant spp.	52n
Murre spp.	111i
Pigeon Guillemot	39i
Horned Puffin	315i
Tufted Puffin	735i
Parakeet Auklet	109i
Black Oystercatcher	2i
Common Raven	4i
Glaucous-winged Gull (Adult)	47i
Glaucous-winged Gull (Immature)	18i
Common Eider	5i
Harlequin	1i
Bald Eagle (Adult)	3i

i = individual
n = nest

Table 25. Population Estimates for Oglodak Island, 13 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	129i
Cormorant spp.		52pr
Murre spp.		111pr
Pigeon Guillemot		43pr
Horned Puffin		788pr
Tufted Puffin		1838pr
Parakeet Auklet		109i
Black Oystercatcher		1pr
Common Raven		4i
Glaucous-winged Gull		24pr
Glaucous-winged Gull	Non-breeders	18i
Common Eider		8i
Harlequin		2i
Bald Eagle		1a
Bald Eagle (Total)		4i

i = individual
pr = breeding pair
a = aerie


Bald Eagle Aerie
Nesting Cormorants
OGLODAK I.

Kasatochi Island (Tables 26 and 27, Fig. 14)

Kasatochi was circumnavigated on 13 July. All observations were made from the 21 foot Boston Whaler. Observation conditions were excellent.

The most abundant seabird present on Kasatochi is the auklet species. Parakeet, crested and least auklets were all positively identified. Large swarming flocks were observed circling high offshore near talus slopes on the northwest and northern shoreline. Auklets are too numerous to venture an estimate of the total population. Sekora (1973) reported an auklet colony containing 22,000 individuals, of which 2% were parakeet, 18% least, and 80% crested auklets. Our observations indicate similar numbers, but we cannot determine percentage of each species without setting up plots. We did count one flock of parakeet auklets in a large raft off shore. We estimated 500 birds to be present. Many auklets were also observed in the pass between Oglodak and Kasatochi.

Murre species were found nesting on the northern tip of Kasatochi. Approximately 2,068 murres were counted. We were unable to approach close enough to distinguish between thick-billed and common murres.

A small colony of cormorants was discovered on the northern shoreline of Kasatochi. Approximately 42 adults and 19 nests were observed. A total of 85 individuals were counted along the entire shoreline. Again, we are unable to approach close enough to identify these birds to species.

Glaucous-winged gulls were numerous on Kasatochi. Most observations were made on the southern portion of the island. Although we did not get ashore on Kasatochi to confirm their presence or absence we did not suspect gulls to be nesting.

Pigeon guillemots, black-legged kittiwakes, harlequin, horned and tufted puffins, and ravens were also present around Kasatochi although not in high concentrations.

Two peregrine falcons were sighted near the auklet colonies. Steep cliff nesting habitat for falcons is abundant along the northern shorelines. The auklet colonies provide an abundant summer food supply for the peregrines. An aerie was never positively located, however, it is safe to assume that an aerie does exist where habitat is most suitable.

Table 26. Population Counts for Kasatochi Island, 13 July 1980.

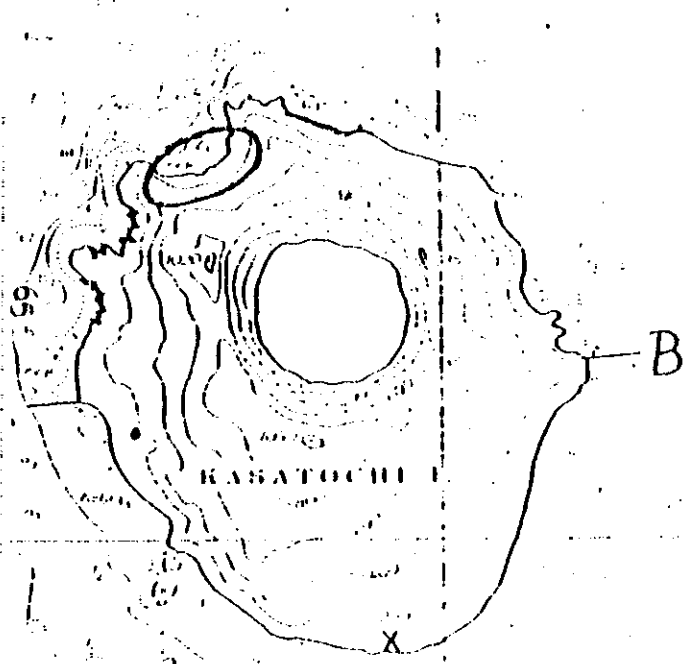
Species	# Counted
Cormorant spp.	85i
Cormorant spp.	19n
Murre spp.	2071i
Pigeon Guillemot	16i
Horned Puffin	11i
Tufted Puffin	18i
Ancient Murrelet	1i
Parakeet Auklet	533i
Crested Auklet	17500i
Least Auklet	4000i
Glaucous-winged Gull (Adult)	107i
Glaucous-winged Gull (Immature)	49i
Black-legged Kittiwake	3i
Common Raven	1i
Harlequin	8i
Peregrine Falcon	2i

i = individual
n = nest

Table 27. Population Estimates for Kasatochi Island, 13 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	60i
Cormorant spp.		19pr
Murre spp.		2071pr
Pigeon Guillemot		18pr
Horned Puffin		28pr
Tufted Puffin		45pr
Ancient Murrelet		1i
Parakeet Auklet		533i
Crested Auklet		17500i
Least Auklet		4000i
Glaucous-winged Gull		54pr
Glaucous-winged Gull	Non-breeders	49i
Black-legged Kittiwake		3i
Common Raven		1i
Harlequin		10i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i

i = individual
pr = breeding pair
a = aerie



WW Auklet Colony

Auklet and 2 Murre Colonies

• Cabin

X WW II Aircraft Remains

○ Peregrine Falcon Territory

Tagalak Island (Tables 28 and 29, Fig. 15)

Tagalak Island was surveyed on 14 July. Visibility and sea conditions were excellent for observation. The small islets extending from the eastern point of Tagalak, as far as Fenimore Pass are included.

Tagalak Island proper doesn't contain any seabird colonies. This agrees with Sekora (1973). However, a colony of nesting tufted puffins was observed on the islets immediately east of Tagalak Island proper. This was not recorded by Sekora. Tufted puffins were observed in high concentrations all along the chain of islets extending out to Fenimore Pass with the majority occurring near the largest islets directly east of Tagalak proper. A total of 1,257 were observed with only 9 occurring around Tagalak Island proper. Horned puffins were also observed, but in considerably lower numbers. These were also assumed to be nesting. Horned puffins were also more numerous around the islets with 247 of the total 293 horned puffins observed around Tagalak being observed there.

Pigeon guillemots were the most numerous seabird observed around Tagalak Island proper and were also observed around the islets. No high concentrations were observed in any single area. Observations were usually of birds offshore and nests were never observed. It is assumed, however, that they were nesting.

Cormorants did not occur in high concentrations on Tagalak. Observations were spread out along the entire shoreline. Only six nests were located on the southeast shoreline of Tagalak Island proper. We were unable to get completely around all of the islets because of their close proximity to each other so it is quite possible that some cormorant nesting activity was overlooked. Taking the total number of cormorants (59) seen in this area into account, however, it is believed that only a few nests could have been missed.

Glaucous-winged gulls were observed along the entire shoreline but nesting was not observed. It is quite possible that, due to the physiography of the islets, nesting did occur. Habitat was definitely available and the inaccessibility to fox made them ideal nesting areas. Immature gulls made up 22% of the total observed. Three murre nests were confirmed and eleven individuals were observed. Again, because we could not get completely around all of the islets a few nests may have been missed.

Eight adult bald eagles were observed during the circumnavigation of Tagalak and three aeries were located; one on the northwest shoreline of Tagalak proper, and the remaining two aeries on the

small islets east of Tagalak. Two territorial adults, indicating the possibility of two additional aeries, were also observed. One peregrine falcon was sighted toward the end of the chain of islets. An aerie was not definitely located, but it is probable that one did exist in the area.

Table 28. Population Counts for Tagalak Island, 14 July 1980.

Species	# Counted
Cormorant spp.	150i
Cormorant spp.	6n
Pelagic Cormorant	24i
Murre spp.	11i
Murre spp.	3n
Pigeon Guillemot	245i
Horned Puffin	293i
Tufted Puffin	1257i
Parakeet Auklet	25i
Black Oystercatcher	29i
Glaucous-winged Gull (Adult)	171i
Glaucous-winged Gull (Immature)	50i
Common Eider (Males)	10i
Common Eider (Females)	17i
Common Eider (Brood)	10(1A)i
Harlequin	121i
Eurasian Green-winged Teal	24i
Bald Eagle (Adult)	8i
Peregrine Falcon	1i
Common Raven	7i
Northern Phalarope	3i

Table 29. Population Estimates for Tagalak Island, 14 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	142i
Cormorant spp.		6pr
Pelagic Cormorant	Non-breeders	24i
Murre spp.		11pr
Pigeon Guillemot		270pr
Horned Puffin		733pr
Tufted Puffin		3143pr
Parakeet Auklet		25i
Black Oystercatcher		15pr
Glaucous-winged Gull		86pr
Glaucous-winged Gull	Non-breeders	50i
Common Eider	Partial Breeders	40i
Harlequin		160i
Eurasian Green-winged Teal		30i
Bald Eagle		5a
Bald Eagle (Total)		15i
Peregrine Falcon		1a
Peregrine Falcon (Total)		3i
Common Raven		7i

i = individual
pr = breeding pair
a = aerie

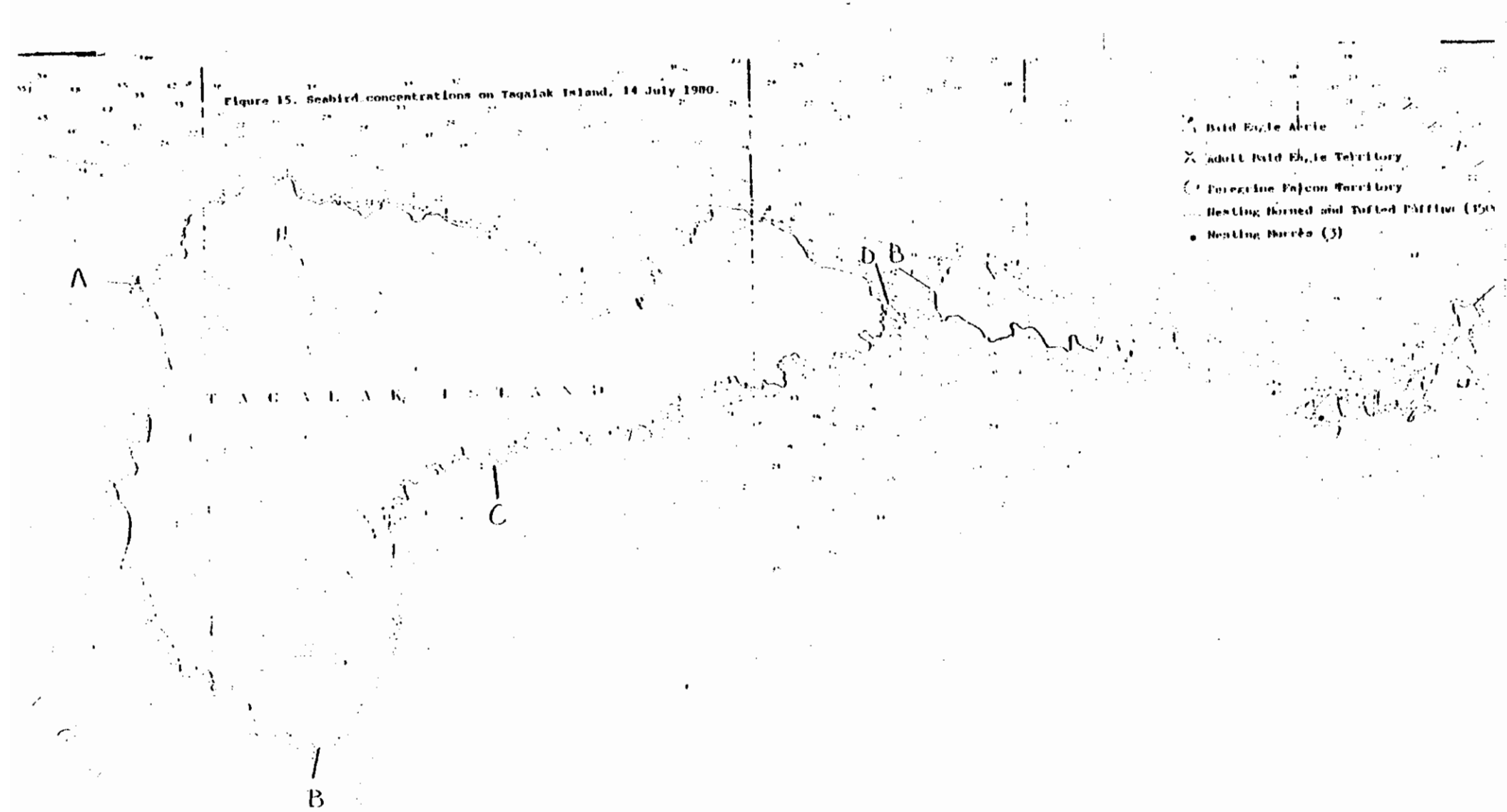


Figure 15. Seabird concentrations on Tagalak Island, 14 July 1980.

Great Sitkin Island (Tables 30 and 31, Fig. 16)

Great Sitkin was circumnavigated on 15 July. Observation was hindered in the morning by low ceiling but improved later in the day.

Great Sitkin doesn't contain any large concentrations of nesting seabirds. Nesting existed in some areas but was minimal.

The glaucous-winged gull was the most numerous species around Great Sitkin. The highest concentrations occurred between Saddle Point and Cape Kiugilak with 223 individuals counted. Nesting activity was noted around Bugle Point, yet there was no evidence that a large colony was present. Of the 543 glaucous-winged gull counted around Great Sitkin 82% were adults.

Tufted and horned puffins were observed along the entire shoreline although never in high concentrations. Minimal nesting activities may exist, however, were never observed on the island.

Pigeon guillemots were observed throughout circumnavigation. Individuals were generally spread out along the entire shoreline with most observations made of birds offshore. Nesting activity was never confirmed, but habitat does exist that could support nesting.

Ancient murrelets were relatively abundant compared to numbers seen around other islands. Of the 108 individuals counted, 81% were seen in Yoke Bay area and between Bugle Point and Teapot Rock. A permanent burrow plot set up on Ulak Island, located about 4.8 km directly east of Bugle Point, found ancient murrelets nesting there. It is likely that the ancient murrelets seen around Great Sitkin were primarily nesting on Ulak, although nesting on Great Sitkin is also probable.

Common eiders were also more abundant around Great Sitkin than around other islands surveyed. Approximately 170 eiders were counted of which 38% were females. One brood of 10-12 ducklings in the I-A class, was sighted in Yoke Bay.

Breeding bald eagles and peregrine falcons were both present on Great Sitkin. Two eagle aeries were located on the southeast shoreline, one in Yoke Bay and the other just west of Bugle Point. Two other areas identified as eagle territories, because the presence of an aerie was not definite, were located on Sulphur Point and Teapot Rock, along the eastern shoreline. A total of eleven adult, two immature, and one fledging bald eagles were recorded. One peregrine falcon aerie was located on the southern-most shoreline, just south of Rip Point. Two adult peregrine falcons were seen at the aerie site. A third falcon was seen along the shoreline between Bugle Point and Teapot rock. It, too, was assumed to be nesting although no aerie could be confirmed.

Table 30. Population Counts for Great Sitkin Island, 15 July 1980.

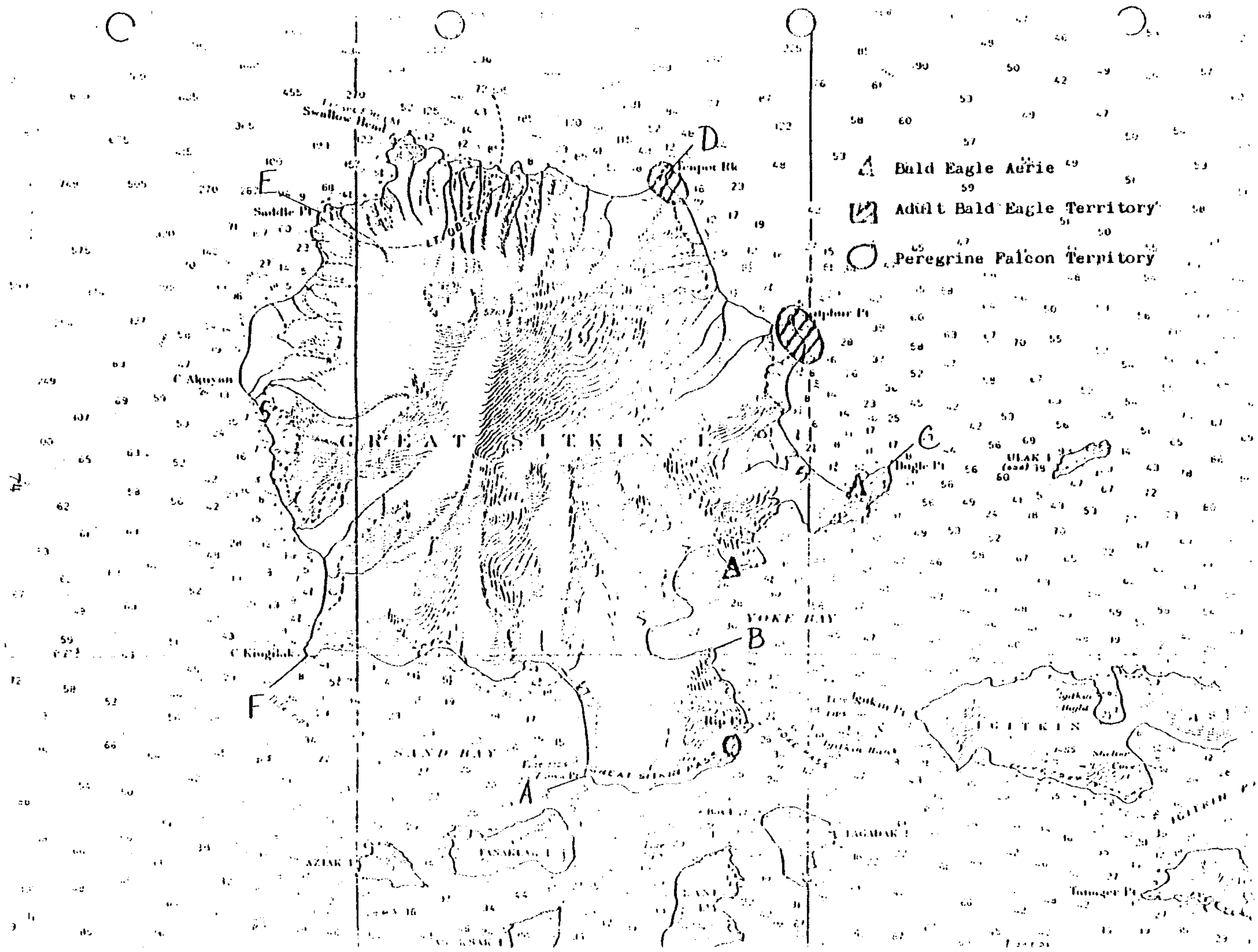
Species	# Counted
Cormorant spp.	297i
Cormorant spp.	4n
Red-faced Cormorant	2i
Murre spp.	17i
Pigeon Guillemot	340i
Horned Puffin	205i
Tufted Puffin	75i
Ancient Murrelet	108i
Parakeet Auklet	1i
Black Oystercatcher	10i
Glaucous-winged Gull (Adult)	435i
Glaucous-winged Gull (Immature)	108i
Glaucous-winged Gull (Fledging)	2i
Common Eiders (Male)	112i
Common Eiders (Female)	58i
Common Eiders (Brood)	12i,I-A
Harlequin	100i
Euarsian Green-winged Teal	62i
Bald Eagle (Adult)	11i
Bald Eagle (Immature)	2i
Bald Eagle (Fledging)	1i
Peregrine Falcon	3i
Common Raven	11i

i = individual
n = nests

Table 31. Population Estimates for Great Sitkin Island, 15 July 1980.

Species		Estimate
Cormorant spp.	Non-breeders	292i
Cormorant spp.		4pr
Red-faced Cormorant	Non-breeders	2i
Murre spp.		17pr
Pigeon Guillemot		374pr
Horned Puffin		513pr
Tufted Puffin		188pr
Ancient Murrelet		108i
Parakeet Auklet		1i
Black Oystercatcher		5pr
Glaucous-winged Gull		218pr
Glaucous-winged Gull	Non-breeders	110i
Common Eider	Partial Breeders	220i
Harlequin		125i
Eurasian Green-winged Teal		100i
Bald Eagle		4a
Bald Eagle (Total)		17i
Peregrine Falcon		2a
Peregrine Falcon (Total)		6i
Common Raven		11i

i = individual
pr = breeding pair
a = aerie



Bald Eagle Aerie
Adult Bald Eagle Territory
Peregrine Falcon Territory
GREAT SITKIN I.
Swallow Head
Saddle Pt
C Akuyan
C Kiniglak
Yoke Bay
Sand Bay
Ulak I
Tanaklak I
Igitkin
Tanager Pt
A
B
C
D
E
F

A comparison of results from the 1980 survey and Sekora's (1973) survey of the Andreanofs show that cormorants have declined by about 30%. The 1980 survey observed a total of 5,300 pelagic and red-faced cormorants, compared to a total of 7,450 observed by Sekora. It is possible that a shift has occurred in the populations of these species, as they are known to change rookery sites from year to year. These movements are believed to be only local, however, and so a shift of this magnitude over such a large geographic area does not seem likely. Another possibility is that Sekora's methods differed from those used in 1980 and that the comparisons, themselves, are inaccurate, and that the populations have not declined as indicated. It was assumed that the population figures given by Sekora for this species, and the others given by him, were total numbers of birds seen at colony sites and not numbers of actual nesting birds.

The comparison also shows a dramatic decline in the numbers of parakeet auklets from Sekora's (1973) data, however, this is undoubtedly unrealistic, as there were colonies on several islands which were not accurately counted in the 1980 survey. There may, in fact, be comparable numbers of this species or more than were present during Sekora's survey.

All other species for which population figures could be found in Sekora's (1973) survey showed an increase in numbers. Common murres increased 165%, from 1000 during Sekora's survey to a bit over 2,650 individuals in 1980; the pigeon guillemot, 66%, from 5,400 to 8,969 individuals; horned and tufted puffins, 21%, from 31,600 to 38,150 individuals; and glaucous-winged gulls, almost 800%, from 500 to 3,980 individuals. This last figure is undoubtedly inaccurate. 1980 figures include immature birds, which account for 25% of all gulls seen. In addition Sekora makes no mention of non-nesting adult or immature gulls. This last statement should also be considered in the comparison of the other species. Sekora only indicated "nesting birds", or rather, birds at nesting colonies, whereas the 1980 estimates include both non-nesting and immature birds.

Numbers of both crested and least auklets were estimated in 1980 using Sekora's (1973) population figures on Kasatochi Island. These may or may not be accurate.

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V MAMMALS & NON-MIGRATORY BIRDS

As done in past narratives, this section will be divided further into Marine Mammals and Land Mammals and Non-migratory Birds. Each section contains an island-by-island account, and marine mammal distribution maps and tables. A marine mammal count summary is also presented for comparison purposes and quick reference (Table 35).

A. MARINE MAMMALS

The species composition of marine mammals counted during the 1980 circumnavigation has shown no variation when compared to previous counts. The species most commonly seen were the sea otter (Enhydra lutris), sea lion (Eumetopias jubata), and harbor seal (Phoca vitulina). Sightings of less common marine mammals included the Pacific harbor porpoise (Phocoena phocoena), Dall porpoise (Phocoenoides dalli), and minke whale (Balaeonoptera acutorostrata). All sightings were made from either the 13' Zodiac, 21' Boston Whaler or from the 65' Aleutian Tern.

Adak Island (Table 35, Fig. 17)

Each island in the Aleutians has distinguishing characteristics and Adak differed from most islands by having extensive beds of kelp. Fourteen percent of the total number of sea otters observed were found in one continuous kelp bed on the northwest coast (Transects X-Y and Y-Z). High concentrations of otters were also found in large, open, and somewhat protected areas, such as Kuluk and Scabbard Bays, and the Bay of Waterfalls (Transects C-D and O-P). These areas supported another 12.9% of the otter population. Otter densities are determined mostly by food availability (Kenyon 1969), so tidal action and nutrient flow in these bays must be sufficient to support large numbers of urchins and other prey.

Otter pups comprised 13.5% of the population on Adak. Previous surveys of other islands (western and west-central Island groups) show higher pup composition in their populations, ranging from 15 to 30%. Some explanations for this difference are: 1) Adak otter populations have reached their maximum densities so that food availability is stressing the present population and lowering the birth rate; 2) there is higher mortality of the pups due to food shortages during critical periods; 3) observers inaccurately reported the number of pups and adults due to poor observation conditions, humanerror and other factors; and 4) censusing was done earlier in the year on Adak than other islands. Kenyon (1969) stated that although pupping occurs year-round, there is a season of maximum births, with the major increase from May to August.

Harbor seals were the second most abundant mammal surveyed. Large congregations of them were found on off-shore islands such as Crone, Channel, and Three Sisters complexes. The coastline from point B-C had 42 seals; a relatively high density. This shoreline consists of Clam Lagoon, where a good food supply exists, and Head Rock, as a hauling out area. Middle Rock, on the eastern shore of Yakak Peninsula, in the Bay of Waterfalls, was a haulout area with a total of 97 seals; all adults. This rock also supported a colony of glaucous-winged gulls.

In past surveys, most seal sightings were incidental to the sightings of other species which were under major study at the time. Therefore, limited seal data are available to compare with the 1980 findings.

Pups comprised 2.5% of Adak's seal population in 1980. This figure is quite low when compared to data from other seal populations in the Aleutians. Other islands with seal groups of 10 or more individuals had anywhere from 5 to 35 pups. Low pup counts for Adak may be attributed mostly to the census technique. The low viewing angle from the survey boats reduced the observations. Since pupping begins in early May, it is also possible that the young had grown sufficiently to appear adult size (Bishop 1967).

Sea lion populations appear to be much lower than in previous years. The total 1980 estimate for Adak is 336 individuals and is comprised of 13% adult bulls and 87% cows and/or yearling bulls. The absence of pups may be due to the time of year the survey was run, or rough seas encountered near the largest colony making observation difficult. Approximately 87% of the sea lions observed were associated with a colony located on Yakak peninsula between Cape Yakak and Lake point. The only other haulout site is located on the north side of Adak on Acorn Rock. Seven cows and one bull were observed there. In contrast to our findings, previous surveys record much higher numbers around Adak (Table 33). Kenyon and Rice (1961) estimated the Adak population at 3,350 individuals, with a colony of 1,000 at Argonne Point, 1,500 at Hook Point, and 500 at Cape Yakak. Sekora (1973) estimated a population of 762 sea lions. A survey conducted by boat in 1979 estimated a population of 1,367, all of which were observed between Cape Yakak and Lake Point. An aerial survey done in early August, 1980, showed the Cape Yakak colony to be at least half again as large as that in June. This, however, does not take the decline from an estimated 1,367 in 1979 fully into account.

A comparison of marine mammal surveys in the Delarof and Andreanof Island, from Gareloi to Amlia Island, from 1960 through 1980 shows no apparent significant change in sea lion populations. Kenyon and Rice (1961) estimated a total of 18,300 sea lions and Fiscus (Pers. Comm.) reported 15,950 in both island groups. Further comparison of individual island groups show the same basic trend. Estimated populations in the Delarofs were 6,600 (Kenyon & Rice 1961) in 1960 and 6,650 in 1979 (Fiscus, Pers. Comm.). Estimates for

the Andreanofs included 11,700 sea lions in 1960 (Kenyon and Rice 1961) and 9,300 in 1979 (Fiscus, Pers. Comm.). A comparison of the islands surveyed in 1980 with Kenyon and Rice (1961) and Fiscus (Pers. Comm.) was also made (Table 33). It appears from this table that the Andreanof populations are declining. It is important to remember that time of day and time of survey (season) can influence the results to a large degree. The results of table 33 should, therefore, be interpreted with this in mind.

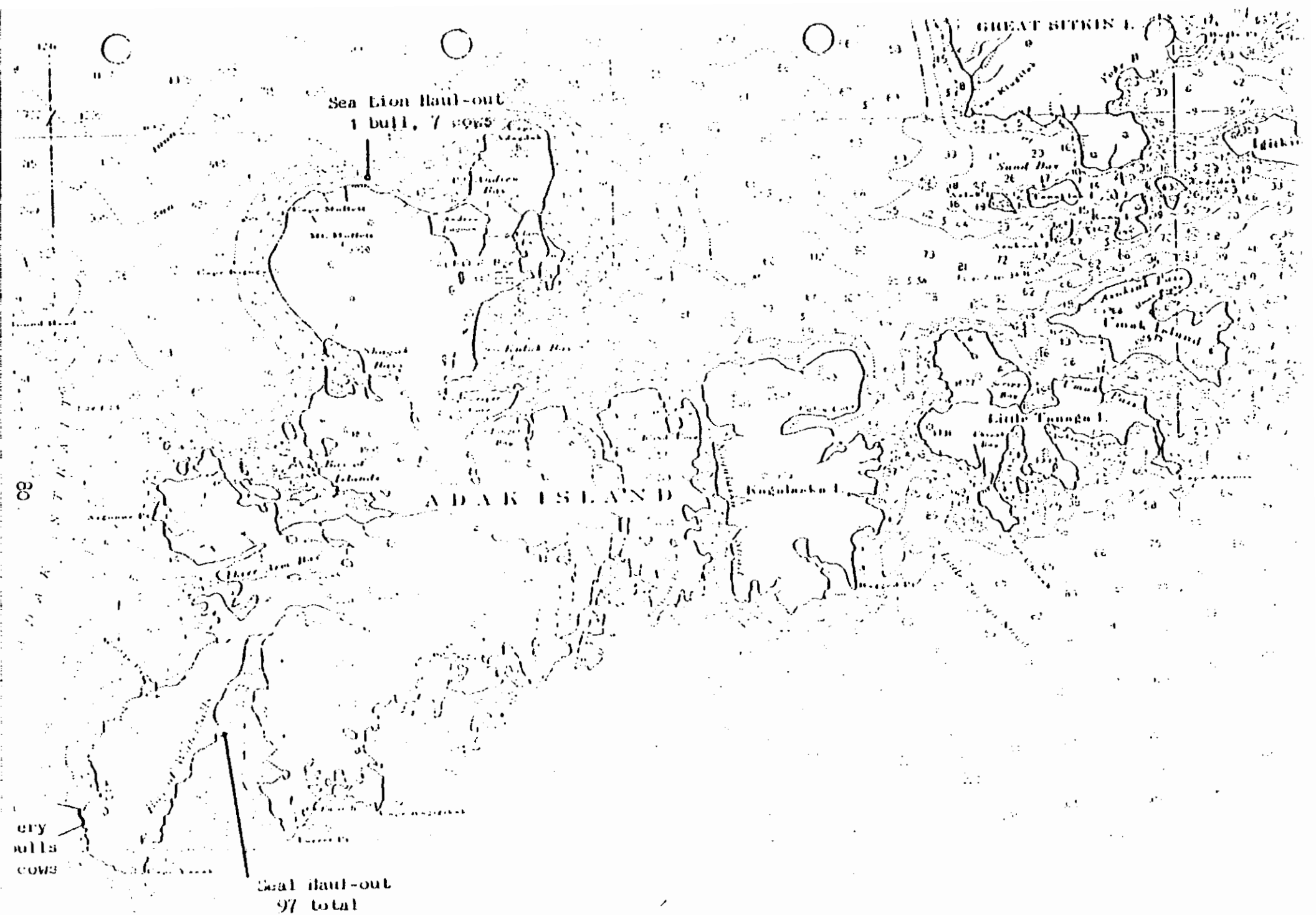

GREAT SITKIN I.
Sea Lion Haul-out
1 bull, 7 cows
ADAK ISLAND
Kagalaska I.
Little Tanaga I.
Seal Haul-out
97 total

Table 35. Populations of Marine Mammals for Individual Islands, 1980

	Adak	Kagalaska	Little Tanaga	Umak	Asiak	Ayuksak	Tanaklak	Don	Tagadak	Kanu	Igitkin	Ulak	Chugul	Tagadak	Kanu	Igitkin	Ulak	Chugul	Anagagalk	Fenimore Rock	Ikiginak	Oglodak	Kanatochi	Tagalak	Great Sitkin
Harbor Seal							6	0	16	0	33	21	73	16	0	37	21	73	0	0	16	41	2	169	84
Adult	623	94	81	43	30	0	0	0	0	0	2	1	4	0	0	2	1	4	0	0	2	5	0	18	16
Pup	16	5	0	3	4	1	4	0	16	0	39	22	77	16	0	39	22	77	0	0	18	46	2	187	100
Total	639	99	81	46	34	1	10.0	-	0.0	10.0	30.4	3.2	37.2	0.0	10.0	30.4	3.2	37.2	4.0	-	3.2	8.0	9.6	22.4	60.0
Total km shoreline	339.2	99.2	96.0	44.8	6.4	4.0	0.8	0	2.0	0.8	1.3	0.9	2.0	2.0	0.8	1.3	0.9	2.0	0	0	5.6	5.8	0.2	0.3	1.5
Density	1.9	1.0	0.8	1.0	5.3	1.9																			
Sea otter							105	9	109	62	283	37	309	109	62	283	37	309	6	0	39	139	20	330	456
Adult	2133	616	763	105	58	37	13	1	36	24	57	12	39	36	24	57	12	39	1	0	3	11	5	49	82
Pup	380	84	146	60	18	11	113	10	145	86	340	49	348	145	86	340	49	348	7	0	32	150	25	304	538
Total	2513	700	909	361	76	48	10.0	-	0.0	10.0	30.4	3.2	37.2	0.0	10.0	30.4	3.2	37.2	0.8	0	3.2	9.0	9.6	22.4	60.0
Total km shoreline	339.2	99.2	96.0	44.8	6.4	4.8	13.3	1	38.1	0.6	11.9	15.3	9.1	10.1	0.6	11.9	15.3	9.1	1.5	0	10.0	10.0	2.6	17.1	7.0
Density	7.4	7.0	9.5	8.1	11.9	10.0																			
Sea lions							0	0	0	0	0	0	0	0	0	0	0	0	16	220	0	0	62	0	3
Bulls	44	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	265	0	0
Cows	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	412	0	7	120	950	12	33
Pup	293	45	495	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	428	220	7	120	1281	12	60
other	336	46	500	0	0	0																			
Total																									

Table 33. Sea Lion Populations for Selected Islands of the Andreanof Group.

	Kenyon & Rice 1961	Sekora 1972	Refuge Survey 1979	Refuge Survey 1980
Adak	3350	726	1367	336
Little Tanaga	450	-	196	500
Great Sitkin	651	440	309	80
Anagagsik	700	145	124	428
Igitkin	700	-	0	0
Oglodak	-	55	-	128
Kasatochi	200	1200	2166	1281
Ikiginak	500	0	5	10
Total	6551	2566	4167	2763

Kagalaska Island (Table 35, Fig. 18)

Kagalaska Island was surveyed on 21 and 23 June. Observation conditions were good with the exception of large swells along the southwestern shoreline.

Approximately 700 sea otters were observed with 12% being pups. Twenty-one percent of the total observed were in the Cabin Cove area (between Cemetery Point and Oglala Point). Females with pups appeared to be concentrated more along the eastern shoreline where 77% of the pups were observed.

As with most of the islands surveyed during 1980, Kagalaska Island shows a substantial increase in the sea otter's population since Kenyon's surveys of 1959 and 1965 (Table 34).

Sea lions did not occur in high concentrations on Kagalaska. A small haulout site comprised of one adult bull and 45 cows and/or yearling bulls, was located on the northern shoreline.

Harbor seals were observed along the entire shoreline, with 31% occurring along the western shoreline, between Cemetery Point and Chaika Rock. About 5 percent of the seals observed were pups.

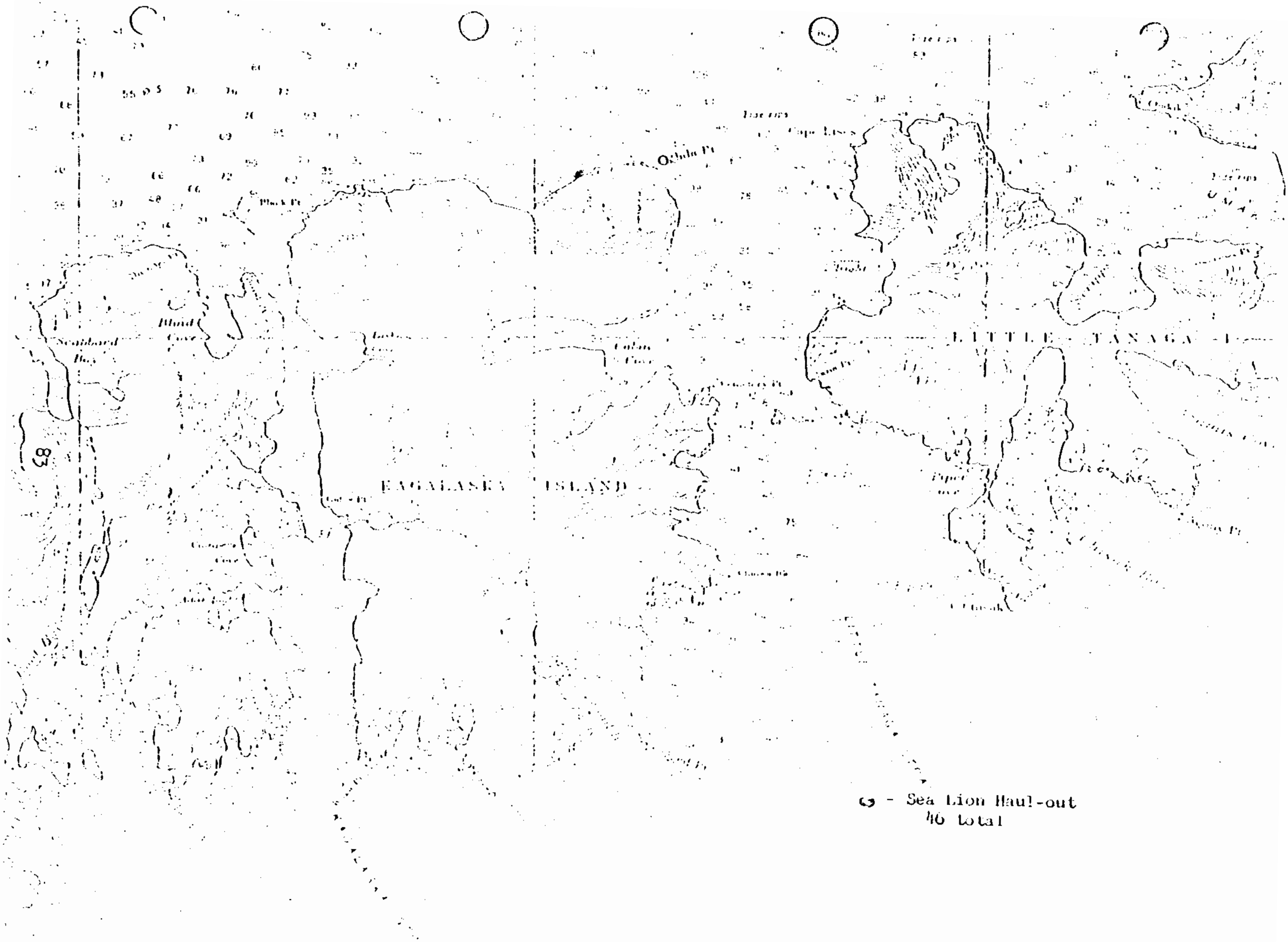

LITTLE TANAGA I
ISLAND
- Sea Lion Haul-out
46 total

Table 34. Sea Otter Populations for Selected Islands of the Andreanof Group.

	Kenyon 1959	Kenyon & King 1965	Refuge Survey 1980
Adak	1,718	1,336	2,513
Kagalaska	1	298	700
Little Tanaga	0	509	909
Umak	0	392	361
Great Sitkin	0	710[1]	1,006[2]
Anagagsik	0	0	7
Igitkin	0	7	355
Chugul	0	5	248
Tagalak	0	7	384
Oglodak	0	6	150

[1] in addition to Great Sitkin the counts made at 12 small islands north of Umak to Atka are included. These 12 islands were not named so could not be included for comparison.

[2] in addition to Great Sitkin the counts made at Kanu, Tanaklak, Aziak, Asuksak, and Tagadak are included.

Little Tanaga Island (Table 35, Fig. 19)

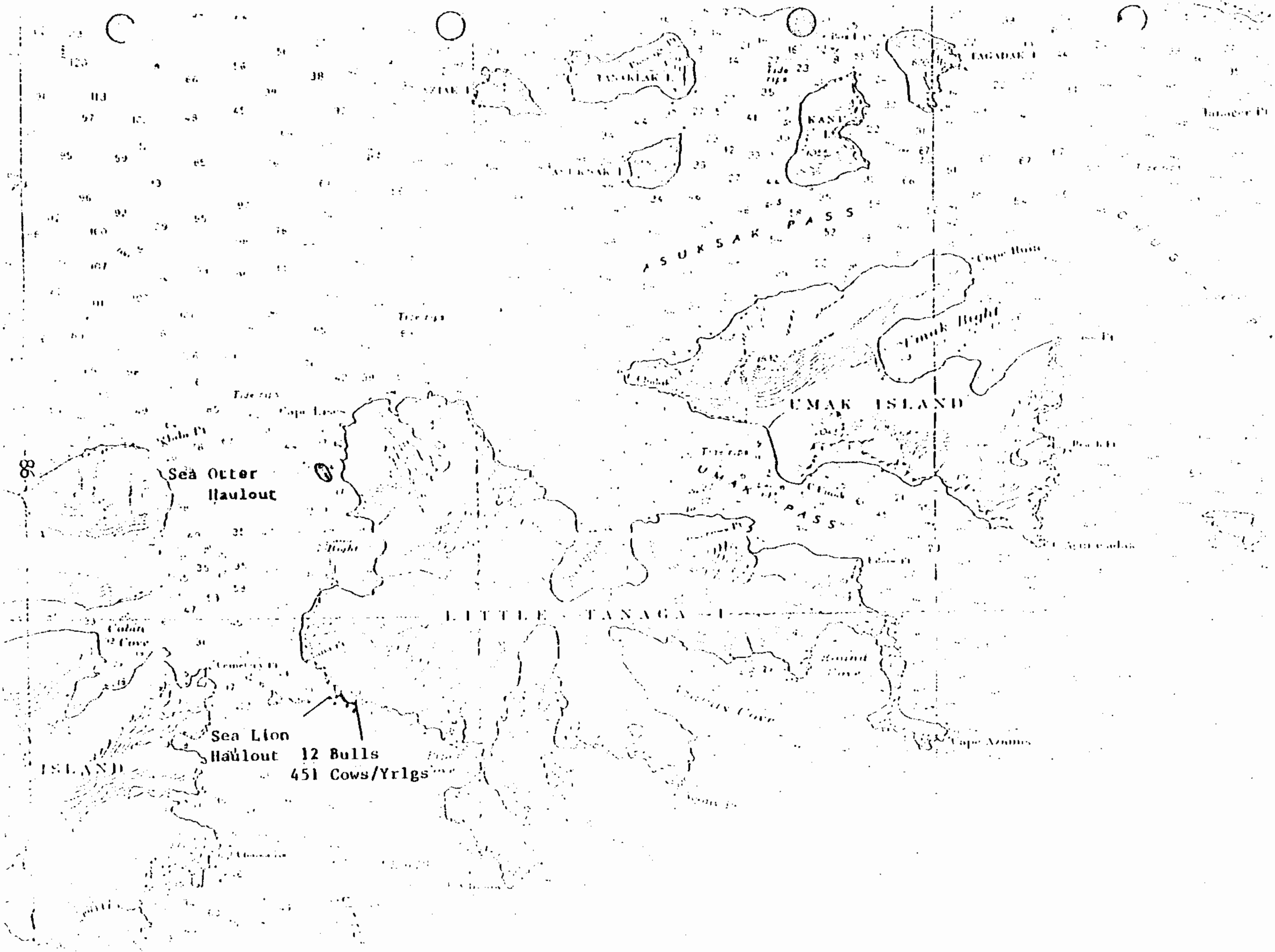
Little Tanaga was surveyed on 23 and 24 June. Observation conditions were good to excellent throughout the circumnavigation. Sea otters were the most abundant marine mammal. Otter pups comprised about 16% of the population. Of the 909 total sea otters observed, 35% of the adults and 23% of the pups were seen on the northwest shoreline. (Transect G-A). About 140 otters were observed in a large kelp bed just south of Cape Lises. Aerial surveys conducted by Kenyon and King (1965) estimated the Little Tanaga population at 509, again, with highest concentration on the northwest shoreline. Twenty-two adult sea otters and four pups were also observed around Silak.

There was one sea lion colony observed on the southwest shoreline, directly east of Silak Island. The colony was comprised of 451 cows and 12 adult bulls and was split up into several off-shore rocks or islets. Whether or not this was a breeding colony or just a hauling out area is not certain. More observations will be made of this site in the future.

Silak Island, located off the southwest shoreline (about 1.6 km southwest of Tana Point), contained a sea lion haulout site with 1 adult bull and 16 cows and/or yearling bulls.

Harbor seals were relatively spread out along the entire shoreline with slightly more being observed on the northwest shoreline (Transect G-A). A total of 60 seals were observed around Little Tanaga.

A total of 21 harbor seals were also observed on and around Silak Island.


ASUKSAK PASS
UMAK ISLAND
Umak Bight
UMAK PASS
LITTLE TANAGA I
ISLAND
Cape Lazo
Sea Otter
Haulout
Sea Lion
Haulout
12 Bulls
451 Cows/Yrlgs

Umak Island (Table 35)

Umak Island was circumnavigated on 25 June. The sea otter population is estimated at 360 individuals with 20% pups. Generally, otters were spread out along the entire shoreline with slightly more being observed on the north shoreline. Unlike most of the islands surveyed in 1980 Umak does not show a substantial increase in sea otter numbers since Kenyon and King's (1965) survey (Table 34). This may indicate that all available vacant habitat provided by Umak has been filled, assuming no otters were missed in 1980.

Sea lions were not present around Umak. This agrees with Sekora (1973) and Kenyon and King (1965).

Harbor seals were seen along the entire shoreline, however, not in high concentrations. Of the 46 total observed, 54% were observed along the northeast shoreline and in the Umak Bight area. Three pups were observed.

Aziak, Asuksak, Kanu, Tagadak, Tanaklak Islands (Table 35)

Tagadak, Kanu, Aziak, Asuksak, and Tanaklak Islands will be discussed together due to their small size, similar habitat, and close proximity to each other. The home range of a sea otter is 5 - 10 miles (Kenyon 1969). It is probable that the home range of an individual otter may include more than one of these islands, thus causing periodical fluctuations in otter numbers around individual islands.

Approximately 468 sea otters were observed around the five islands. Concentrations varied as follows: Asuksak 10%, Aziak 16%, Kanu 18%, Tanaklak 24%, Tagadak 31%. Pups comprised about 22% of the total number observed.

It is somewhat difficult to compare our observations with previous estimates made by Kenyon and King (1965). They did not specifically record numbers for these individuals instead combined the counts of 12 islands north of Umak to Atka with Great Sitkin's total. It is not clear which islands were actually included, but it is almost certain that Aziak, Asuksak, Kanu, Tagadak, and Tanaklak, were among the 12. Combining the 1980 totals from Great Sitkin and these five islands the total already surpasses Kenyon and Kings total by 300 with still seven other islands not included. Kenyon and King (1965) state that in the Andreanof Island group contiguous islands containing a large amount of unoccupied sea otter habitat are available. Their surveys conducted in 1959, 1962, and 1965 indicated a 25% population growth, extending from east to west. The portion of the Andreanof Islands surveyed in 1980 surely agrees with the trend of population growth described by Kenyon and King.

Harbor seals were observed around every island totalling about 75 individuals. Pups made up six percent of the number observed. As

mentioned previously low percentages of pups may be due primarily to the lateness of the season and/or observation techniques.

Sea lions were never observed around the five islands.

Igitkin (Table 35)

Igitkin Island was surveyed on 29 June with good observation conditions.

Sea otters were observed along the entire shoreline of Igitkin. Approximately 340 sea otters were observed with 18% being pups. About 49% of sea otters were observed on the southern shoreline between Igitkin Point and Shelter Cove. Kenyon and King (1965) reported only seven sea otters around Igitkin. Again this supports the trend of population growth and expansion of the sea otter.

Harbor seals were observed along the entire shoreline with the exception of Igitkin Bight. Approximately 39 seals were observed with 2 being pups. It is possible that pups could have been missed because they are difficult to spot, hidden by their parent or misidentification as an adult.

Sea lions were not present on Igitkin in 1980. This agrees with Sekora (1973) and Fiscus (Person. Comm.). Kenyon and Rice (1961), however, reported a colony of 700 on the southwest point of Igitkin.

Ulak Island (Table 35)

Ulak Island was surveyed on 29 June with excellent observation conditions.

Approximately 49 sea otters were observed around Ulak with 24% being pups. About 80% were observed on the north side of Ulak.

Harbor seals were seen on both the south and north side of Ulak. Of the 22 seals observed, one was a pup.

Sea lions were not present around Ulak.

Chugul Island (Table 35)

Chugul Island was surveyed on 2 July with good observation conditions.

Approximately 230 sea otters were observed with 17% being pups. Sea otters were generally evenly spread out along the entire shoreline. Kenyon and King (1965) reported only five sea otters around Chugul (Table 34).

Harbor seals were seen along the entire shoreline with 80% occurring along the northern shoreline. Of the 77 total observed, 5% were pups. Two cow or yearling bull sea lions were observed during the survey.

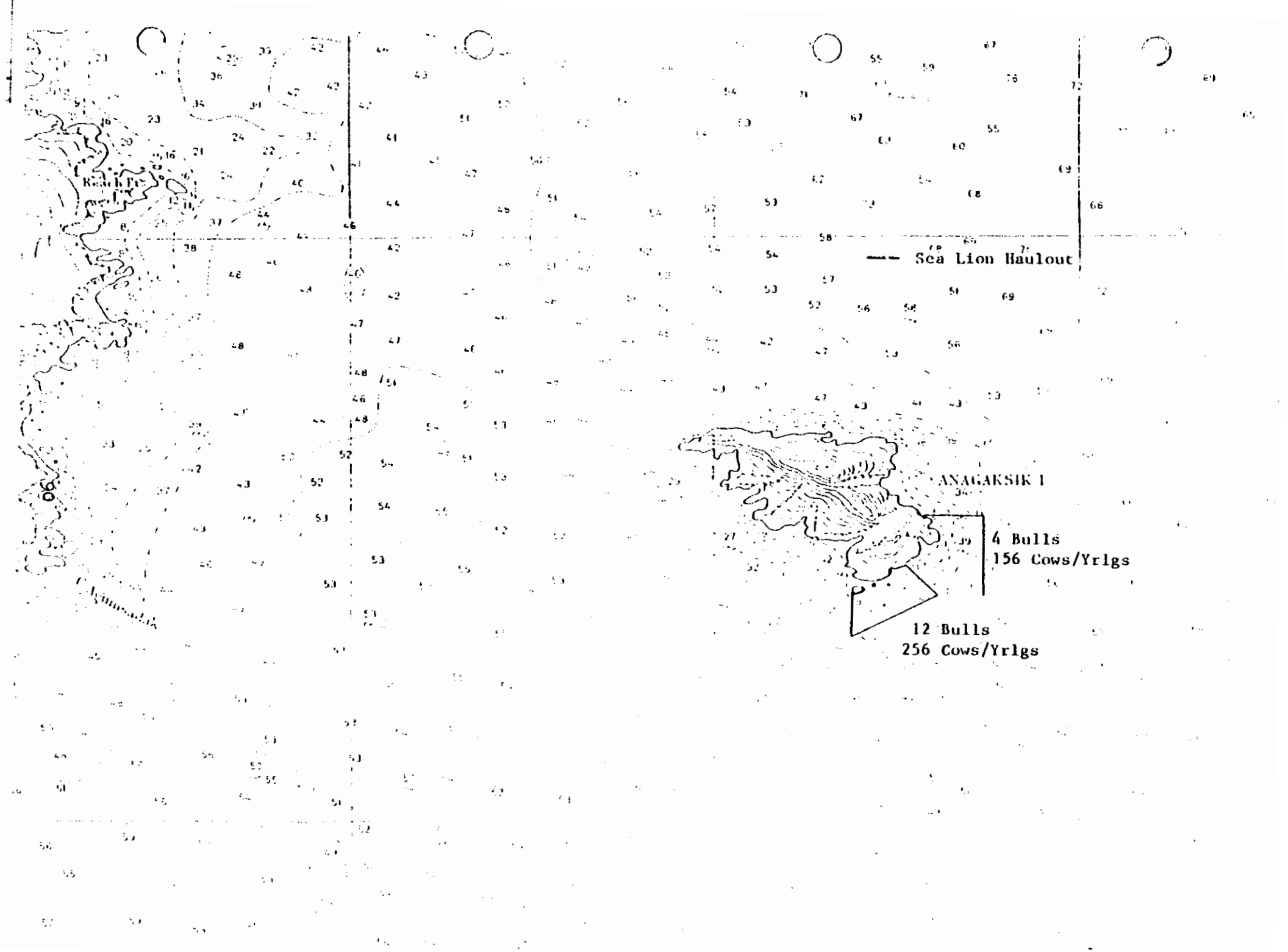
Anagaksik Island (Table 35, Fig. 20)

Anagaksik Island was circumnavigated on 2 July. Observations were made from the Boston Whaler due to rough seas.

Approximately 430 sea lions were observed on the southeast corner of Anagaksik. Two distinct haulout sites were observed. A total of 5 bulls and 156 cows and/or yearling bulls were seen on the northern shoreline. Another 12 bulls and 256 cows and/or yearling bulls were observed along the southern most shoreline. Pups were not observed at either location. A survey conducted on 27 June 1979 showed sea lions to be hauled out on the southwest point and numbering only 124 individuals with 4 bulls. Anagaksik is a relatively unprotected island subject to high surf. The island does not appear to possess desirable pupping ground areas.

Sea otter numbers were limited to six adults and one pup. Due to Anagaksik's small size, available habitat is limited, however, does show the continued expansion of the sea otter since none were seen by Kenyon in 1959 or 1965.

Harbor seals were not observed around Anagaksik.

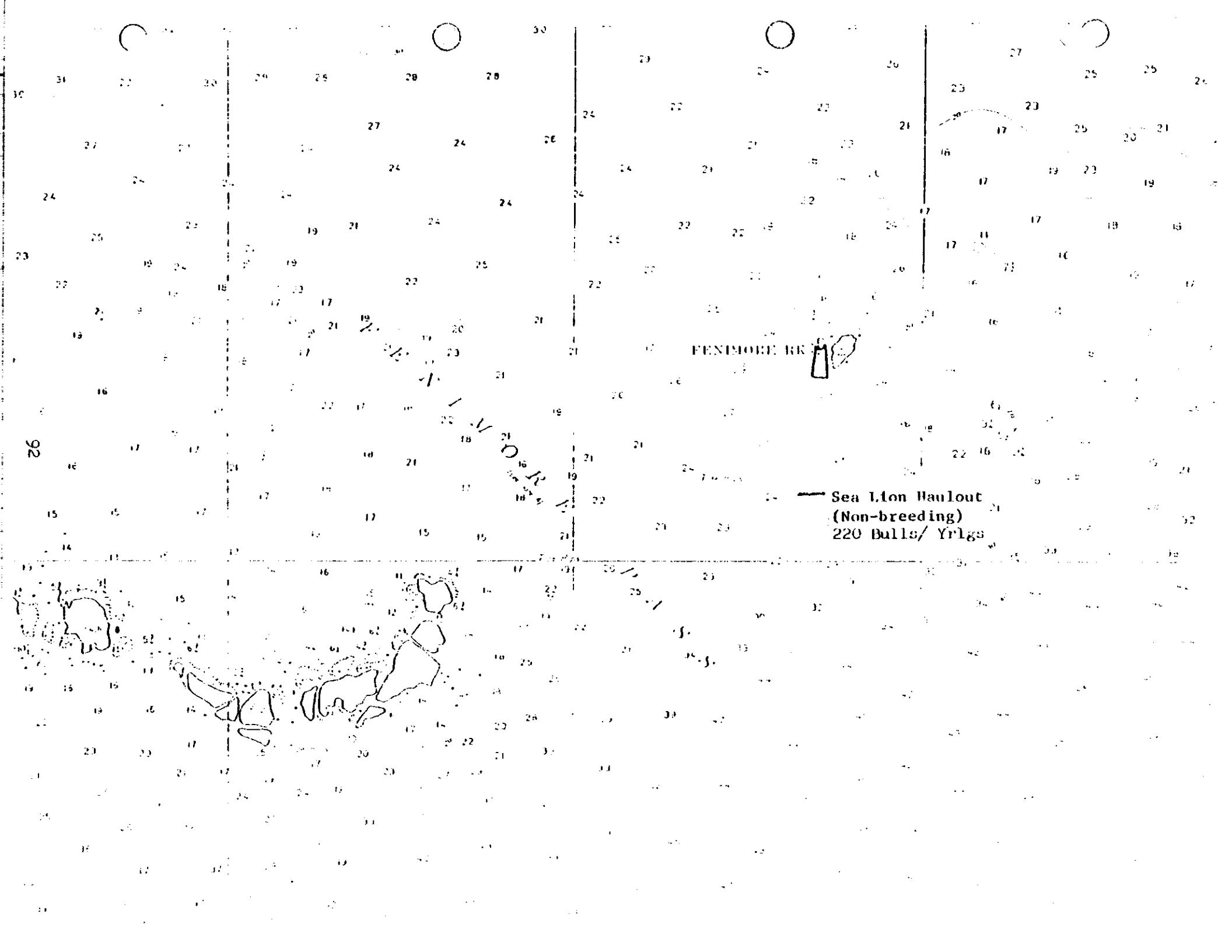

Sea Lion Haulout
ANAGAKSIK I
4 Bulls
156 Cows/Yrlgs
12 Bulls
256 Cows/Yrlgs

Fenimore Rock (Table 35, Fig. 21)

Fenimore Rock was surveyed 13 July with good observation conditions. The small size of Fenimore Rock doesn't provide habitat enough to support high concentrations of marine mammals.

Sea lions did use Fenimore Rock as a hauling out site. Approximately 220 non-breeding bulls were observed.

Sea otters and harbor seals were not observed around Fenimore Rock.


FENIMORE RK
Sea Lion Haulout
(Non-breeding)
220 Bulls/ Yrlgs

Ikiginak Island (Table 35)

Ikiginak was surveyed on 13 July with good observation conditions. Approximately 32 sea otters were observed around Ikiginak of which 90% were located on the north side. Nine percent of the total were pups.

A total of seven sea lions, all cows and/or yearling bulls, were observed around Ikiginak. These were observed in the water and most likely were associated with the other sea lions hauled out on Oglodak. Kenyon and Rice (1961) reported 500 sea lions, Sekora (1972) reported none, and Fiscus (Person. Comm.) reported only five sea lions around Ikiginak.

Harbor seals were present around the entire shoreline. A total of 12 seals were observed on the south side of the island, two of which were pups. Six were seen on the north side.

Oglodak Island (Table 35)

Oglodak Island was surveyed on 13 July with good observation conditions. The density of sea otters around Oglodak was very high; approximately 18.8 sea otters per km of shoreline. Of the 150 otters observed, 7% were pups. About 93% of the total were observed along the western shoreline. Numerous small islets and exposed rocks amid thick kelp beds provided shelter and apparently an abundant food supply since sea otters are generally distributed in accordance with food availability. About 39 otters were seen hauled out on several of the exposed rocks.

A total of 129 sea lions, composed of all cows and/or yearling bulls were seen primarily on the west side of Oglodak. They were hauled out on the off-shore rocks and many were observed in the water and became very curious of our presence, approaching to within a few feet of the boat.

Seals were also relatively abundant and were spread out along the entire shoreline. Of the 46 total seals observed, 10% were pups. The numerous exposed rocks provided extensive hauling out areas.

Kasatochi Island (Table 35, Fig. 22)

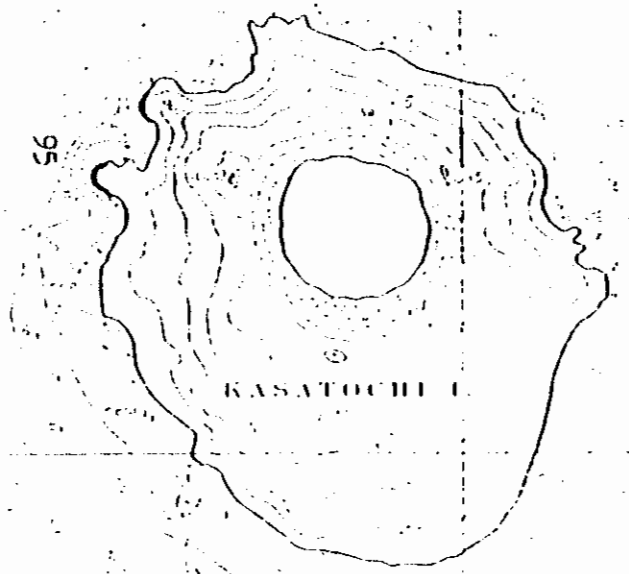
Kasatochi was surveyed on 13 July with excellent observation conditions.

One sea lion rookery consisting of 1,281 animals was located on the northwest shoreline of Kasatochi. The colony was composed of 74% cows and/or yearlings, 5% bulls and 21% pups. The colony was divided into two haulout sites by a talus slope area. The rookery site was extremely rocky with steep cliffs and ledges. Sea lions were seen hauled out almost 20 meters above the water on rocky ledges that would otherwise seem unattainable by a sea lion. Disturbance by man that would result in a stampede, would undoubtedly be hazardous to those sea lions

attempting a quick retreat to sea. Sekora (1973) reported 1,200, and Fiscus (Person. Comm.) reported 2,166 sea lions on Kasatochi. Prior to these surveys Kenyon and Rice (1961) reported only 200 sea lions on Kasatochi (Table 33).

Sea otters existed along the entire shoreline. The density/km of shoreline was 2.6 with 20% being pups. Kenyon and Rice (1961) reported no sea otters around Kasatochi. Information on numbers between 1960 and 1980 is not available to determine when sea otters became established.

Harbor seals were limited to two individuals sighted on the north side of the island.



Sea Lion Colony

62 Bulls
950 Cows/ Yrlgs
269 Pups

Tagalak Island (Table 35)

Tagalak Island was surveyed on 14 July with good observation conditions. The small islands extending east from Tagalak to Fenimore Pass are included in the tallies, and will be referred to as the eastern islets.

Sea otters are relatively abundant around the entire shoreline of Tagalak. About 45% of the sea otter observations occurred around the eastern islets. Pups comprised about 12% of the population. The present sea otter population of Tagalak shows the continued trend of sea otter expansion.

Sea lions were limited to a few hauling out sites and occassional observations of sea lions in the water. About eight cows and/or yearling were seen around Tagalak Island proper and 12 individuals (bulls, cows, and yearlings) were observed around the eastern islets.

The harbor seal density around Tagalak was the greatest of all islands surveyed in 1980. About 8.3 seals existed per km of shoreline. Of the 187 seals observed 69% were located around the eastern islets, and 78% of those were observed on the northern shorelines of the islets.

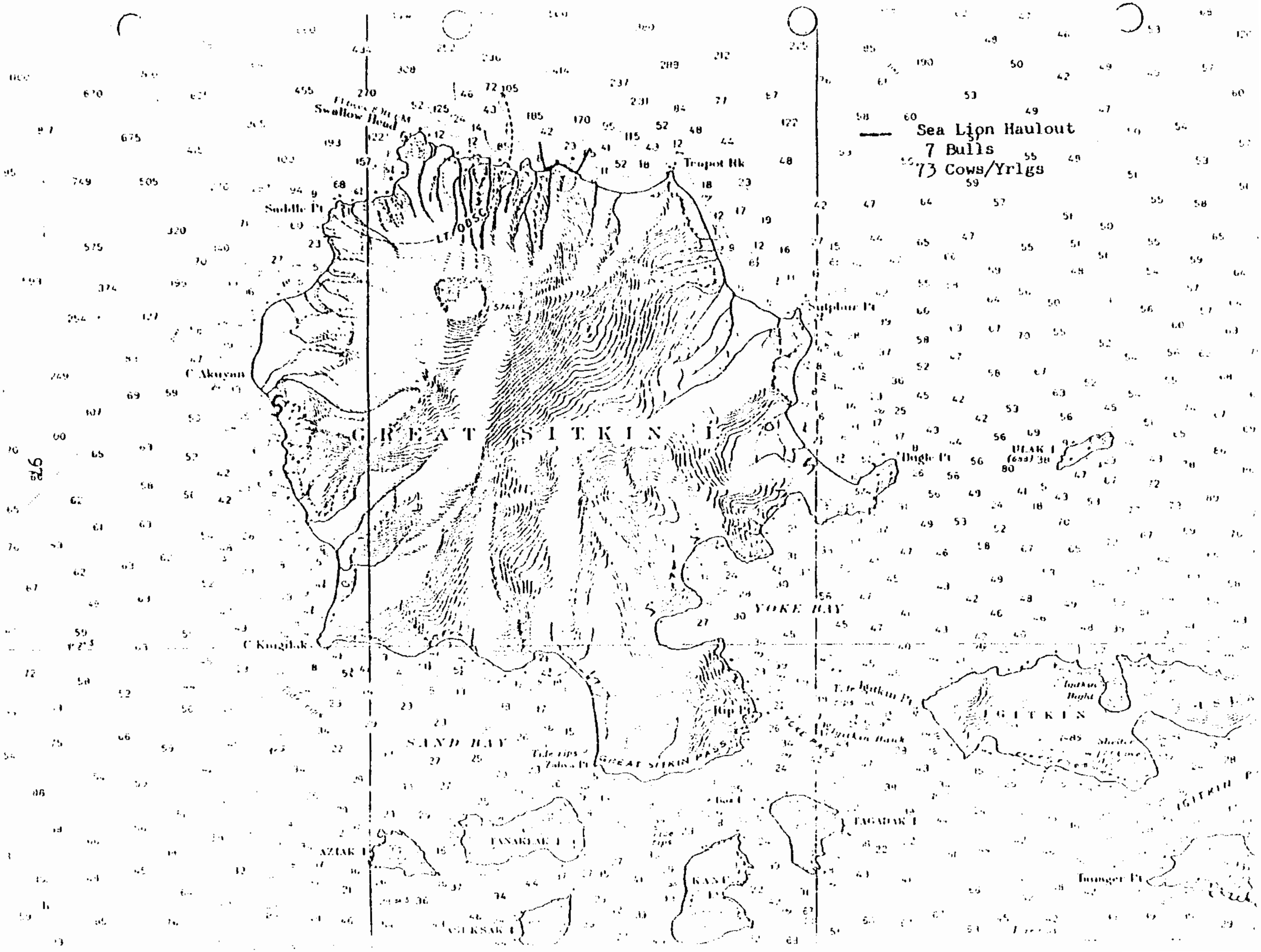
Great Sitkin Island (Table 35, Fig. 23)

Great Sitkin was surveyed on 15 July with good observation conditions.

Approximately 538 sea otters were observed around Great Sitkin and of those 15% were pups. Generally, sea otters were spread out along the entire shoreline with 48 sea otters, five of which were pups, were seen hauled-out in this same area. Kenyon and Rice (1961) reported no sea otters around Great Sitkin and Kenyon and King (1965) reported 710 (The 1965 count included several nearby islands). Refer to table 34 for more information.

Sea lions were observed on the northern shoreline mid-way between Teapot Rock and Swallow Head. Of the 80 sea lions seen seven were adult bulls and the remaining were cows and/or yearlings. No pups were seen. In contrast to our findings, previous surveys reported higher concentrations. Fiscus (Person. Comm.) reported a total of 309 with seven adult bulls and 302 cows and/or yearlings. Sekora (1973) reported 440 total individuals and Kenyon and Rice (1961) reported 650 individuals. Sea lions in 1980 were observed in a different haul-out site than described by these previous surveys. Fiscus, Sekora, and Kenyon all described the colony to be located on Swallow Head and/or Saddle Point. The 1980 survey found the colony to be aobut 4.8 km to the east. A comparison of the 1979 survey with the 1980 survey of the eight major islands containing sea lion concentrations, shows a 34% reduction. Compared to Kenyon and Rice (1961) it is a 58% decline (Table 33).

Harbor seals were seen along the entire shoreline with the exception of the western shoreline. Approximately 100 seals were observed, of which 16% were pups.


Sea Lion Haulout
7 Bulls
73 Cows/Yrlgs
GREAT SITKIN I
Swallow Head
Saddle Pt
C Akuyan
C Kugilak
Tropot Rk
Sulphur Pt
Bight Pt
ULAK I
YOKE BAY
SAND BAY
GREAT SITKIN PASS
TAGADAK I
TANAKLAK I
AZIAK I
IGITKIN
Tanager Pt

Other Observations of Marine Mammals

Various species of cetaceans were infrequently observed during the circumnavigation work and during trips to and from the base camps on Little Tanaga and Adak headquarters.

On three separate occasions Dall porpoises were observed during our travels to and from Scripps Bay and Adak headquarters. An average of five porpoises were seen each time. They travelled along side the whaler for distances ranging from 100 meters to over a kilometer. On 15 June a pod of six to ten were observed just north of Little Tanaga, one of which wore a red/orange tag.

On one occasion a harbor porpoise was sighted during the circumnavigation of Adak Island.

Minke whales were infrequently seen in Umak Pass and Sitkin Sound.

B. Land Mammals and Non-migratory Birds

Three species of land mammals and non-migratory birds were observed this season: the arctic fox (Alopex lagopus), caribou (Rangifer tarandus granti), and rock ptarmigan (Lagopus mutus). The Norway rat (Rattus norvegicus), although not observed during circumnavigation, is known to exist on Adak and Great Sitkin Islands, and possibly others as well. Due to the differences in habitats inherent with most of the islands each will be discussed separately.

Adak Island

A total of nine arctic fox, at least three of which were ~~dark~~ white phase, were observed during the circumnavigation of Adak. Five were seen in the Kagalaska Strait/Boot Bay area, three on Yakak Peninsula and one in Shagak Bay. On-shore investigations of Statten, Argonne, and Dora Islands revealed fox activities, either past or present, on those islands. The other islands in the Bay of Islands had no fox sign and are not believed to support occasional populations of or individual fox. None of the remaining islands surrounding Adak proper showed any sign of fox activities. No attempt was made to estimate numbers of fox on Adak, but they are believed to be fairly abundant.

A total of 19 caribou were observed during the survey. Nine were seen in Blind Cove, one near Cape Yakak and nine in the middle arm of Three Arm Bay. Caribou scat and fur were also found on Ringold Island. The 1980 pre-hunting season population estimate put the number of caribou at approximately 400 to 425 animals.

Ptarmigan were also observed during the circumnavigation work. Seven were observed during the on-shore investigation of North Island; six on North Island itself and one on Adak proper just across from North Island. One was also observed during the on-shore investigation of Ringold Island. No attempt was made at estimating the population of ptarmigan on Adak, however, future plans include the development and implementation of a census technique for rock ptarmigan in an effort to determine its abundance on Adak.

Kagalaska Island

A total of 10 arctic fox, nine of which were light phase, were observed on Kagalaska Island. Four were observed near Laska Cove, two just south of Cemetery Point and six in the Cabin Cove area. No attempt was made to estimate the number of fox on the island, however, it is fairly abundant as indicated by the number of observations.

Four rock ptarmigan were also observed during the survey of this island; all on the north end of the island. Again, no attempt at estimating numbers was made but it is believed to be fairly abundant, anyways.

Little Tanaga Island

One dark phase fox was observed during the actual circumnavigation of Little Tanaga, and that was in Piper Cove. Another fox was observed at our camp in Scripps Bay and became quite accustomed to us, even venturing into the cabin if allowed. It was obviously attracted by the trash pit located by the tent and was searching for food, but after a few visits lost its "fear of man" to some degree. This was believed to be a different fox than that observed at Piper Cove, although a trail was followed from Scripps Bay to Chisak Bay and also all down its west side to Piper Cove. An intensive search of the island for fox signs and dens suggests that Little Tanaga supports only a few fox. The majority of the trails observed were in the central part of the island where Scripps Bay, Chisak Bay, and Azamis Cove are in close proximity to each other. Refer to figure 24 for trail locations.

No ptarmigan were observed during the actual circumnavigation, however, 12 were seen during the search for fox and the running of the inland bird transects. No attempt was made at a population estimate, however, the ptarmigan is believed to be fairly abundant on Little Tanaga.

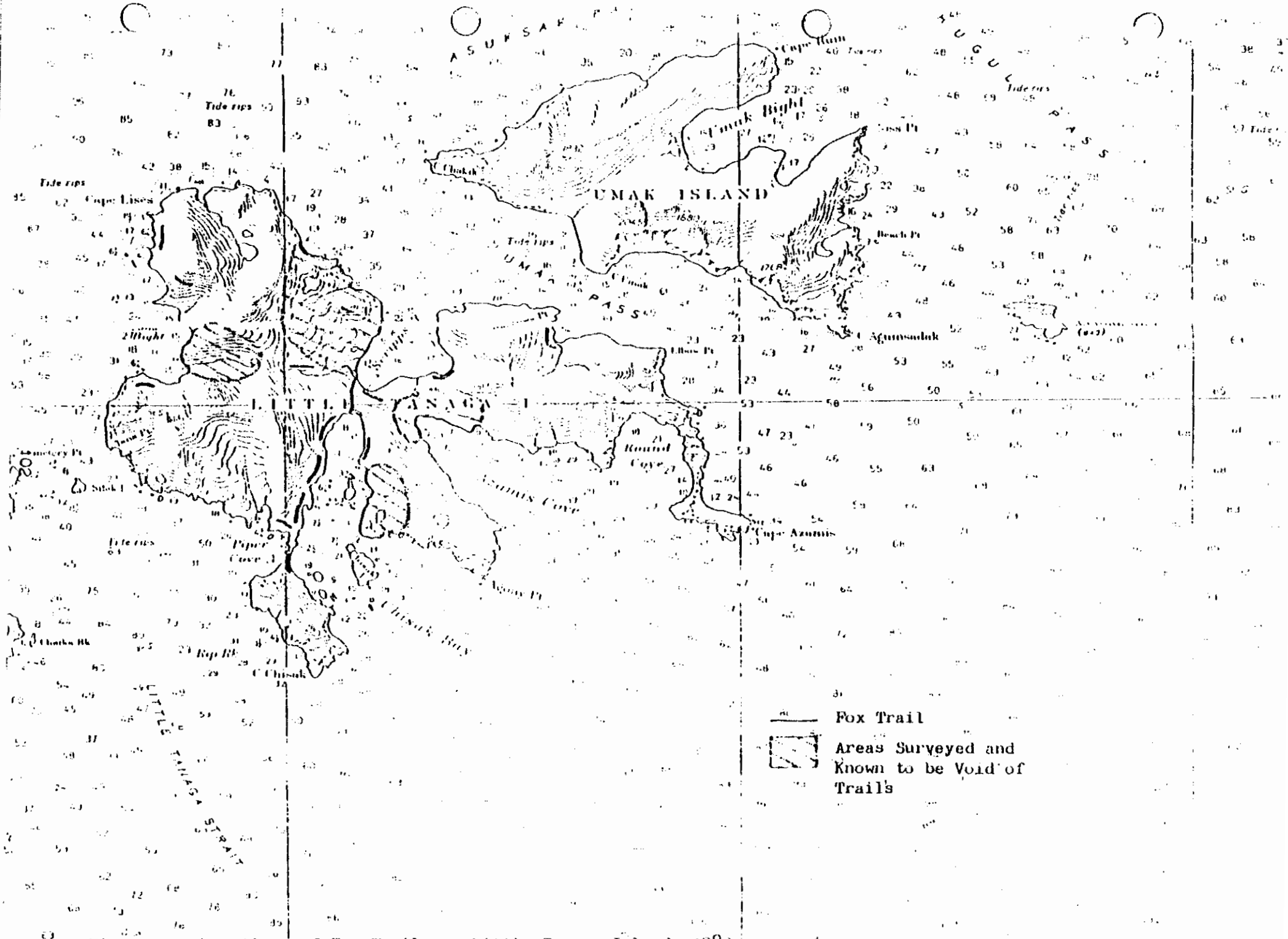


Figure 24. Locations of Fox Trails on Little Tanaga Island, 1980.

Umak Island

No fox were observed during circumnavigation but one set of tracks was observed during a 30-minute stay ashore on the north arm of Umak Bight. On-shore investigations were also conducted on the south arm of Umak Bight and on the beach just northwest of Cape Umak. No fox sign was observed in either of these areas or anywhere else around the island. It is quite probable that the fox population is limited by the lack of accessible beaches on the island. Only about 15% of the shoreline is accessible from the interior of the island. The remainder of the coast is mostly sea cliffs except for Umak Bight and a few beaches on the southwest side of the island.

Four ptarmigan were observed in the Umak Bight area during the on-shore investigation. Four were also seen during the running of the inland bird transects. It is fairly evident that the island supports a fair number of ptarmigan.

Aziak Island

No fox or fox sign was observed on Aziak Island. Murie (1936) stated that fox sign was observed on the island during his survey, although no individuals were actually sighted. Evidentally fox could not exist on the island over a long period of time, due to a lack of available food during critical periods. Only 10% of the islands shoreline is accessible from the interior.

One rock ptarmigan was observed on the north side of the island. Due to its size and physiography it is believed that only a minimal population is present on the island.

Asuksak Island

No fox or fox sign was observed on Asuksak Island. None were observed by Murie (1936) during his survey either, however, he stated that a few fox were introduced in 1930. Three ptarmigan were observed on the island.

Tanaklak Island

No fox, fox sign, or ptarmigan were observed on this island. A few trails were observed during Murie's (1936) survey. Evidently fox could not exist here either. It is possible though, that a small number of ptarmigan exist on the island.

Box Island

No fox on Box.

Tagadak Island

No fox, fox sign or ptarmigan were observed on Tagadak Island. No reference could be found concerning the historical status of the fox on this island, so it is not known at this point whether fox were ever introduced onto this island. It is possible, however, that a small population of ptarmigan exists on the island.

Kanu Island

No fox or fox sign was observed on Kanu. Murie (1936) did observe several individuals around one den on the west side. Evidently the fox could not exist. Two ptarmigan were observed on the island.

Igitkin Island

Although no fox were seen during the circumnavigation of Igitkin Island, an on-shore investigation of both Shelter Cove and Igitkin Bight revealed the presence of fox on the island. Several trails and many tracks were observed on both beaches and in the isthmus between the two bays. About 20% of the shoreline around the island is accessible to the fox. For these reasons it is believed that several fox inhabit Igitkin Island, although no attempt to estimate their number was made.

Ulak Island

No fox, fox sign, or ptarmigan were observed during both the circumnavigation of Ulak and the running of the permanent plots. Murie (1936) indicated that fox were never introduced onto the island because of it's inability to support them.

Although ptarmigan could probably survive on Ulak, its size and isolation more than likely result in minimal utilization if any occurs at all.

Chugul Island

No fox were seen during the circumnavigation or the initial on-shore investigation of Chugul. A fox trail, but no tracks, was observed during the initial investigation and so on 14 July a return visit was made and one set of fox tracks were seen on the beach at North Bight. Only about 10% of the shoreline is available for use by fox. As a result of the investigations and the analysis of the shoreline it is believed that only a small population of fox inhabit the island. No attempt was made, however, to estimate their number.

One rock ptarmigan was observed during the actual circumnavigation of the island and the initial on-shore investigation turned up two other sightings. Although no attempt was made to estimate the population of ptarmigan on Chugul, a fair number are believed to exist there.

Anagaksik Island

No fox, fox sign, or ptarmigan were seen during the circumnavigation of Anagaksik Island. An on-shore investigation was impossible as the island has no accessible beaches. According to Murie (1937) fox were not introduced onto this island. It is, therefore, assumed that there are no fox on the island.

Ptarmigan could probably exist on Anagaksik, however, utilization is more than likely minimal to non-existant due to both the island's size and isolation.

Fenimore Rock

No fox or ptarmigan exist on Fenimore Rock.

Ikiginak and Oglodak Islands

No fox exist on either of these islands to our knowledge and were never believed to have been introduced there (Murie 1937). There are no beaches which are accessible from the interior of either island.

Ptarmigan were not observed on either island, but could probably exist there. Their size and isolation, however, more than likely result in minimal utilization, if any occurs at all.

Kasatochi Island

No fox, fox sign or ptarmigan were observed during the circumnavigation of this island. As the survey was done via the Boston Whaler an on-shore investigation was not conducted. It is quite probable that a population of fox does exist on Kasatochi. Murie (1936) stated that at least 16 were observed on the island during his survey and that a den was found on the north side near an auklet colony, and a trapper's cabin still stands on the west side of the island. For these reasons an on-shore investigation to confirm either the presence or absence of fox on the island is recommended.

Rock ptarmigan could also exist on Kasatochi. The investigation to confirm the presence or absence of fox on the island would probably also confirm the presence or absence of ptarmigan.

Tagalak Island

No fox, fox sign or ptarmigan were observed during the circumnavigation of this island. On-shore investigations didn't produce any evidence of fox or ptarmigan, either. No reference concerning the historical status of fox on Tagalak could be found so it is not known whether or not they ever existed on the island. Perhaps a more extensive investigation is in order. This would also help determine whether or not ptarmigan exist there.

Great Sitkin Island

A total of six fox, three adults and three pups, of which one adult and two pups were dark phase, were observed on the south side of Great Sitkin during the circumnavigation of the island. Although no attempt was made to estimate the fox population of the island, a fairly healthy population is believed to exist there.

No ptarmigan were observed during the survey but Murie (1937) stated that they were abundant on the island at times. At this time it is not known whether or not they still exist. An on-shore investigation might confirm the presence or absence of ptarmigan on Great Sitkin.

VI MISCELLANEOUS ACTIVITIES AND OBSERVATIONS

A. Beached Animal Surveys

A total of two beached animal surveys were conducted during the summer of 1980, one on Umak Island and the other on Buldir Island. Refer to Day, et al (1979) for objectives and methods for these surveys.

The transect on Umak Island (Fig. 25) was set up this year and was located on the south side of the island just northwest of Cape Umak. The transect begins at the western edge of the cobble-stone beach where it disappears into rugged, rocky coastline, and continues southeast to the beached remains of a barge. The total length of the survey is approximately 1.2 km. It was run only once, on 1 July by John Mueller, and turned up no beached animals. The currents of Umak Pass, caused by the changing tides, constantly move materials along the coast and provide definite opportunities for dead animals to wash up on the beach. They also clean the beach on a regular basis, especially during stormy weather when seas are rough. Due to this fact this beach must be surveyed fairly often to offer any valuable information as to natural mortality rates or population crises.

The transect on Buldir (Fig. 26) was initiated in 1977, making this the fourth year it was run. It is located on the north side of the island in North Bight. The transect extends from the base of Northwest Point directly in front of the base camp eastward to the large rocks at the west edge of Main Talus. The beach differed this year in that it was entirely sand to storm-tide level where it changed to cobble, as compared to an entirely cobble beach in previous years. It was run once this year, on 18 August by Tom Early, Jack Arnold, Kevin Brennan, John Mueller, and Leslie Slater.

Several species were observed during the Buldir survey. The remains of 8 auklet spp., 13 adult and 7 fledgling glaucous-winged gulls, 2 cormorant spp., 2 immature glaucous gulls, 2 puffin spp. and 11 unidentified bird species were found.

The presence of most gull remains seemed to be the result of normal chick and young bird mortality. Most of the auklet and puffin remains were very weathered and it was difficult to determine whether predation was the cause. Due to the fact that large populations of both auklets and puffins exist on Buldir it is quite possible for such large numbers of naturally dying birds to wash up on the beach. Also lending to this belief is the fact that peregrine falcons, the major predators on Buldir, take their prey to the aerie site rather than eat it where they kill it. Therefore, it seems unlikely that many predatory remains would show up on the beach.

Adult sea lions were identified mainly by the presence of skeletons or partial skeletons. Those remains were most likely remnants of last years mortality of adults during and just after the pupping season. The remains of the pups, on the other hand, were all from the 1980 breeding season. Possible causes of death for these include still birth, abandonment, and smothering and/or crushing by adults.

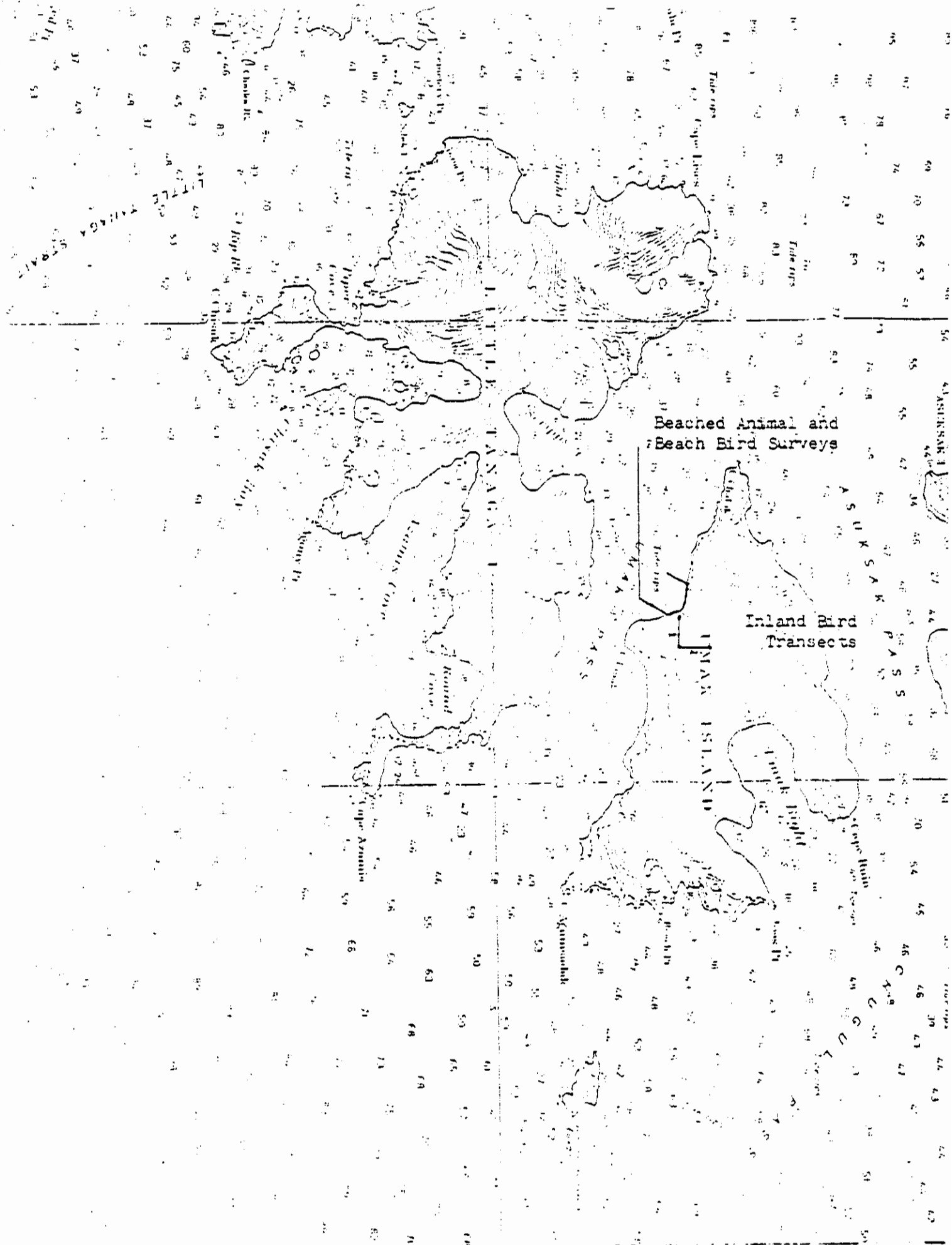
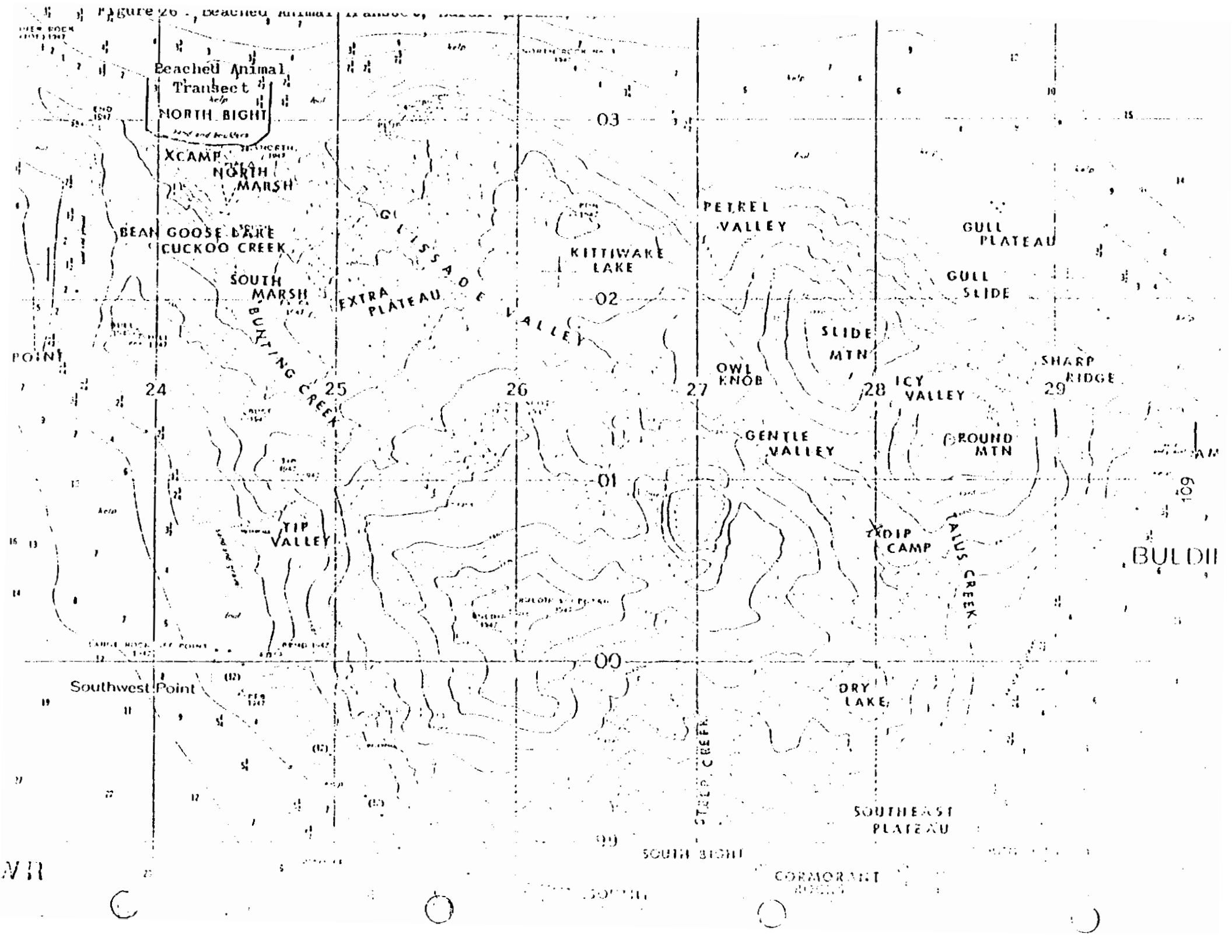


Figure 25. Beached Animal, Beach Bird and Inland Bird Transects on Unalaska Island, 1980.


Beached Animal Transect
NORTH BIGHT
XCAMP
NORTH MARSH
BEAN GOOSE LAKE
CUCKOO CREEK
SOUTH MARSH
BUNTING CREEK
EXTRA PLATEAU
GLISSADE VALLEY
KITTIWAKE LAKE
PETREL VALLEY
GULL PLATEAU
GULL SLIDE
SLIDE MTN
OWL KNOB
ICY VALLEY
SHARP RIDGE
GENTLE VALLEY
ROUND MTN
TIP VALLEY
DIP CAMP
TALUS CREEK
DRY LAKE
STALK CREEK
SOUTHEAST PLATEAU
SOUTH BIGHT
CORMORANT
Southwest Point
POINT
03
02
01
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26
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28
29
169

B. Terrestrial Transects

Beach Transects

Only one beach transect for terrestrial birds was set up and run this season. It is located on Umak Island and is the same stretch of beach as that for the beached animal transect (Fig. 25). Refer to Day, et al (1979) for methods used in this transect. A total of two species were observed during the survey; four song sparrows and four winter wrens.

Inland Bird Transects

Six permanent inland bird transects were established and run this season on two different islands. Four were run on Little Tanaga Island and two on Umak Island.

Of those on Little Tanaga Island (Fig. 27), 3 were established and run on 1 July 1980 by Tom Early and Jack Arnold. Transect 1 runs from an aluminum stake located 100 m from the beach and 30 m from the north side of the stream at the southwest end of Scripps Bay to a stake located on the peak located on compass course 33° magnetic at an elevation of 610 feet. The total length of the transect is about 1,875 m. Transect 2 runs from the stake marking the end of transect 1 to another stake located on a hummock on a small prominence located on compass course 205° magnetic at an elevation of 490 feet. The total length of transect 2 is about 2,100 m. Transect 3 starts at the stake ending transect 2 and runs to the stake beginning transect 1, and its total length is about 2,350 m. They were run again on 8 July by Jack Arnold and John Mueller when a fourth transect was established and run. Transect 4 begins just below the peak located on compass course 110° magnetic from the mouth of the stream at the southwest end of Scripps Bay and is marked by an aluminum pole. The transect runs on compass course 75° magnetic to an aluminum pole located on a small hummock about halfway to the peak on the same compass course. The length of transect 4 is about 1,250 m.

The transects on Umak Island (Fig. 25) were established and run on 1 July 1980 by Tom Early and Bev Minn. Transect 1 begins within 50 m of the beach and just south of the stream that enters Umak Pass 1.5 km northwest of Cape Umak. It is marked by an aluminum pole. It runs for approximately 300 m on compass course 76° magnetic to an aluminum pole on a local prominence at an elevation of 675 feet. Transect 2 runs from the pole marking the end of transect 1 for approximately 900 m to another aluminum pole at a pass located on compass course 345° magnetic and at an elevation of 450 feet.

The methods used in each transect are described by Emlen (1971) and Day, et al (1978). The results of all transects run this season are summarized in table 36 and specific information and inland transect forms are included in refuge files.

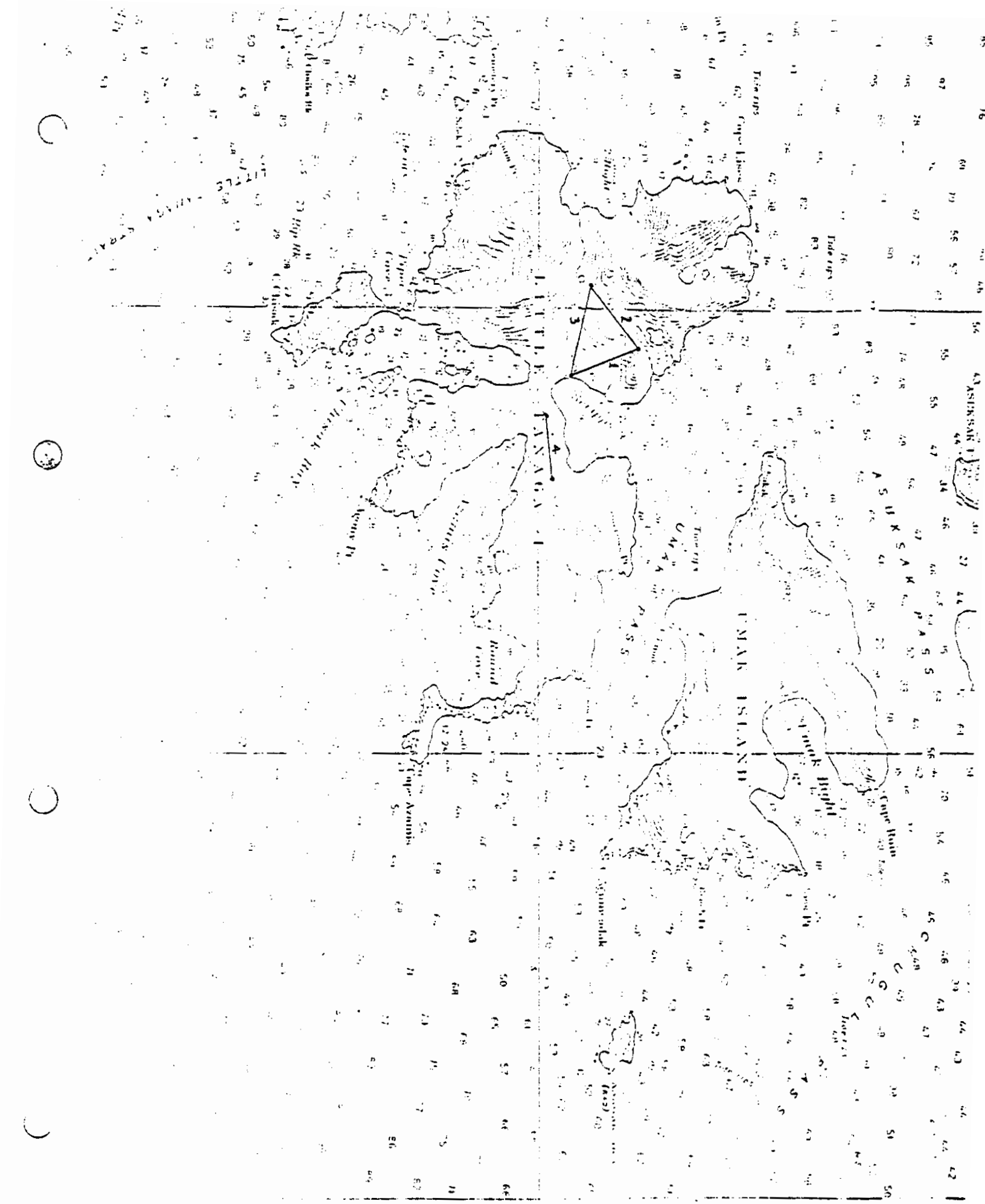


Figure 27. Inland Bird Transects, Little Tanaga Island, 1980.

These transects should be run on a regular basis and fairly often to gain a reliable index of diversity and density. Future plans include a possible fox iradication program on Little Tanaga and a reliable pre-iradication index is necessary if any comparisons are to be made during and/or after the iradication program.

Table 36. Results of Inland Bird Transects on Little Tanaga and Umak Islands, 1980.

AVERAGE NUMBER OF BIRDS PER 100 HECTARES*

Island	Lapland Longspur	Snow Bunting	Rock Sandpiper	Rock Ptarmigan
Little Tanaga	22.04	2.18	1.14	2.22
Umak	35.45	-	2.56	3.71

* Number of birds equals total average of all transects on each island (Little Tanaga - 4, Umak - 2).

Permanent Plots

A total of three permanent nesting plots were established and surveyed this season; two on Ulak Island and one on Aziak Island. The plots on Ulak Island (Fig. 28) were established on 14 July. One plot (Plot W) was placed at the southwest corner of the island and the other (Plot E) was placed on the south side about one third of the way from the west side to the east side of the island.

Plot E is located at about 60 meters in elevation, at an aspect of 180° is 15 m x 15 m in area and is marked at each corner by an aluminum pole. The dominant vegetation was Elymus spp. with some Heracleum spp., Angelica spp., and Clatonia spp. The soil in the plot was a loose sandy texture, possibly a sand-loam, with much organic matter and free of rocks. Above the plot the soil graded into rocky soil typical of puffin nesting habitat, and below into rocks typical of auklet nesting habitat. The plot was searched intensively for individual burrows and burrow attempts. Burrows were categorized as active (A) if an adult, egg or chick were found within and inactive (I) if found empty. Unsuccessful burrow attempts were noted as dead ends (D). The results are summarized in tables 37 and 38.

Plot W is located at 81 m in elevation and at an aspect of 210°, is 10 m x 10 m in area and is marked at each corner by an aluminum pole. Here, too, the dominant vegetation was Elymus spp. with some Angelica spp. and Clatonia spp. Soils in this plot were of the same type as in plot E. This plot was also intensively searched and all burrows and attempts were categorized as in Plot E. The results for Plot W are summarized in tables 37 and 38.

One plot was established on Aziak Island on 17 July. This plot is located on the south side of the island at approximately the mid-point (Fig. 29). It is located at about 21 m in elevation, at an aspect of 210°, is 20 m x 20 m in area and is marked at each corner by an aluminum pole. Again, the dominant vegetation was Elymus spp. and the soils were of the same type as in Plot E and Plot W. This plot was intensively searched and categorized in the same manner as the other two plots and the results are summarized in tables 37 and 38. A number of other islands were surveyed for suitability for future permanent plots. Those were: Asuksak, Kanu, Tagadak, Tanaklak, Anagaksik, and North Islands. All but two are located in the vicinity of Great Sitkin; those being Anagaksik and North Islands; and all but one were surveyed by foot, Anagaksik. Those in the vicinity of Great Sitkin; Asuksak, Kanu, Tagadak, and Tanaklak; were not chosen for permanent plots for one of two reasons: either no burrows were found, or those found were in such low densities as to make establishing a plot impractical. Anagaksik Island was surveyed by boat and was not chosen because of the inability to get ashore. North Island was surveyed on 7 June and a considerable number of nesting glaucous-winged gulls were observed. A future nesting plot would be beneficial in estimating the breeding population of gulls on North Island.

Table 37. Data on burrows and their status in permanent plots E and W at Ulak Island and Aziak Island, 1980.

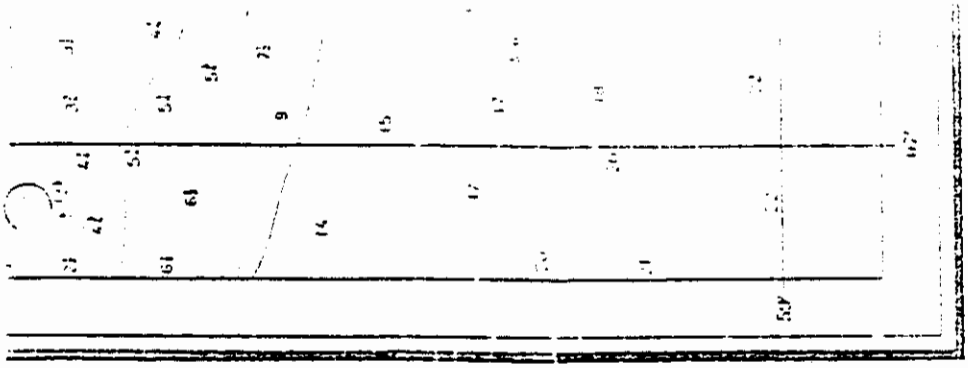
Species	Dead End	Inactive	Active With Just Birds	Active With Eggs/Young	Too Deep to Tell	Total
			ULAK Plot E			
FT SP		1	2	22		25
LE SP			1	1		2
Petrel	2	14		1	5	22
AN MU				1		1
CA AU				12		12
AU/MU				1		1
Puffin	1	3	3			7
Unknown	24	14		1	4	43
TOTAL	27	30	6	39	9	113
			ULAK Plot W			
FT SP			1	4		5
LE SP				1		1
AN MU				1		1
Unknown	10	3			1	14
TOTAL	10	3	1	6	1	21
			AZIAK			
C. Eider				1		1
FT SP		13	3	1		17
AN MU				2		2
TOTAL		13	3	4		20

FT SP - fork tailed storm petrel
LE SP - Leach's storm petrel
AN MU - ancient murrelet
CA AU - Cassin's auklet
AU/MU - auklet/murrelet
Puffin - horned or tufted puffin

Table 38. Summary of the status of burrows in permanent plots E and W at Ulak Island and Aziak Island, 1980.

	ULAK		AZIAK	
Species	#Burrows	% of Total	#Burrows	% Total
Total Petrels (FT, LE, UNK)	55	41.04	17	85.00
FT petrel - all	30	22.39	17	85.00
FT petrel - active*	26	19.40	1	5.00
LE petrel - all	3	2.24	0	0.00
LE petrel - active	2	1.49	0	0.00
UNK petrel - all	22	16.41	0	0.00
Total AN Murrelet	2	1.49	2	10.00
AN Murrelet - active	2	1.49	2	10.00
Total CA Auklet	12	8.96	0	0.00
CA Auklet - active	12	8.96	0	0.00
Total Auklet/Murrelet	1	0.75	0	0.00
Auklet/Murrelet - active	1	0.75	0	0.00
Total Puffin	7	5.22	0	0.00
Puffin - active	0	0.00	0	0.00
Total Eider	0	0.00	1	5.00
Eider - active	0	0.00	1	5.00
Total Unknown Species	57	42.54	0	0.00
Total #Burrows	134	100.00	20	100.00

* Active = with eggs or young
FT petrel - fork-tailed storm petrel
LE petrel - Leach's storm petrel
UNK petrel - petrel spp. (unknown)
AN murrelet - ancient murrelet
CA auklet - Cassin's auklet
Puffin - horned or tufted puffin



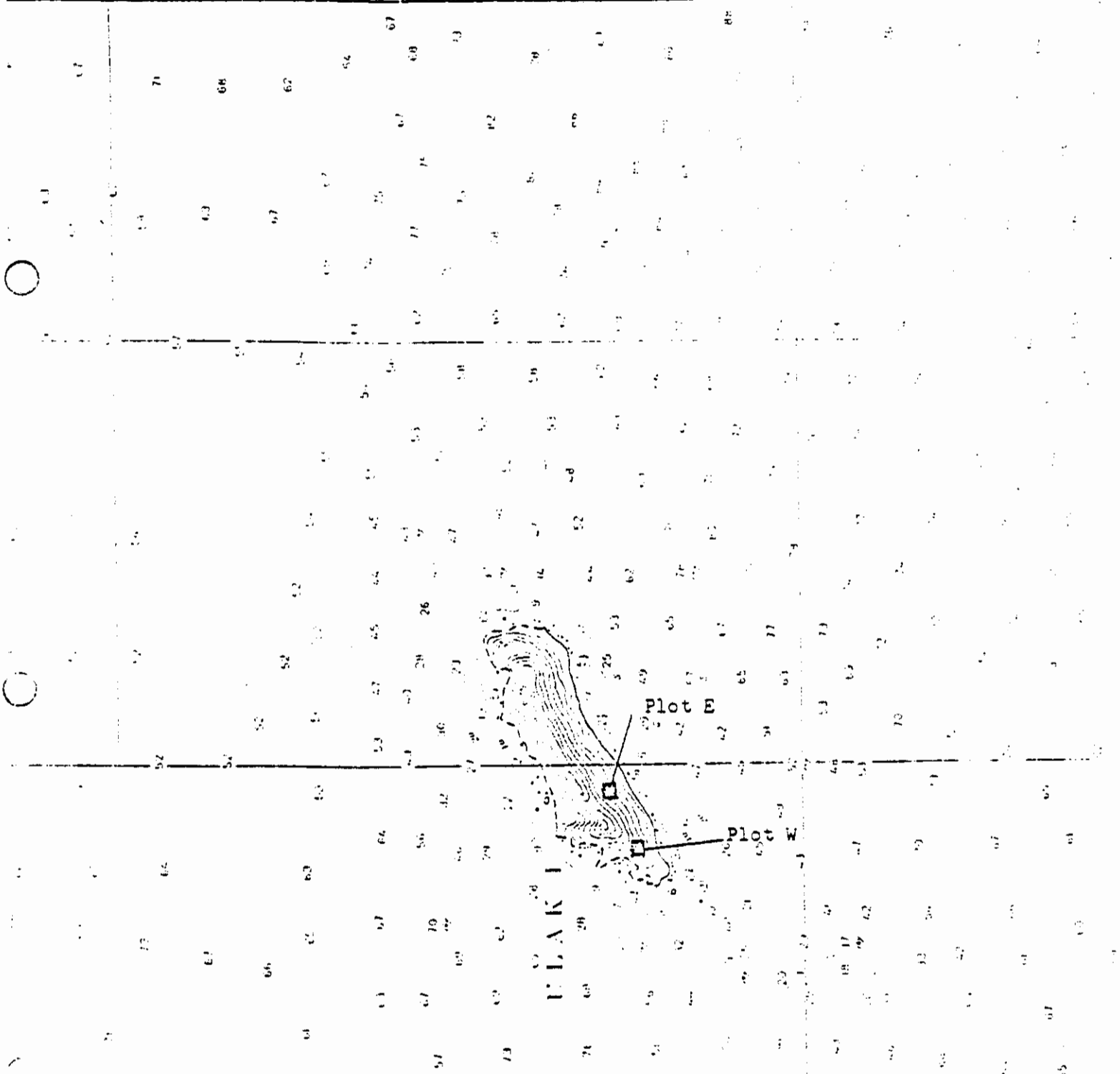


Figure 28 . Permanent Plots on Ulak Island, 1980.

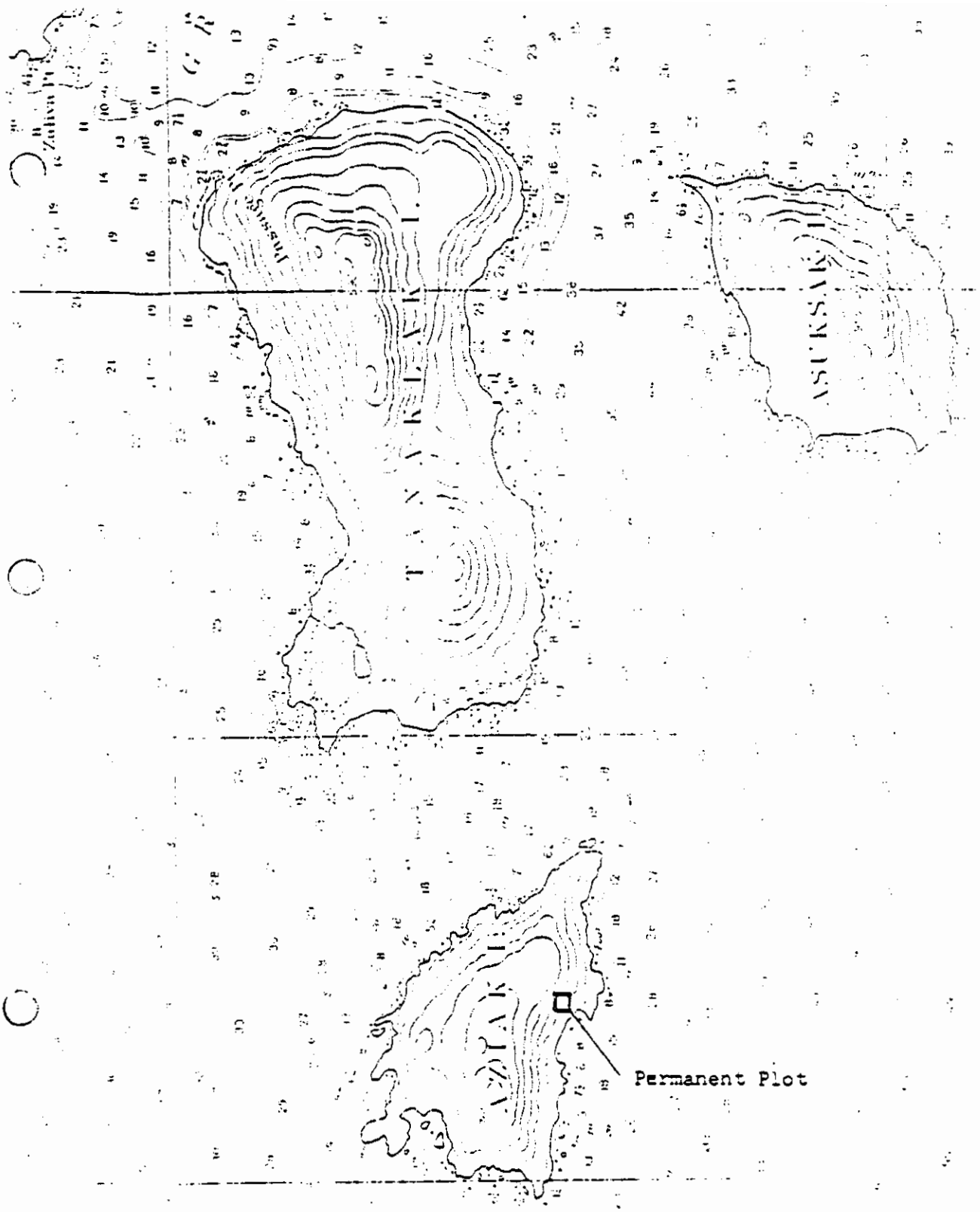


Figure 29. Permanent Plot, Aziak Island, 1980.

C. Pelagic Bird Transects

During the 1980 season pelagic surveys were used to record at-sea distribution and abundance of seabirds. The methods used are described by Spindler (1976) and past data is on file at the AINWR office.

A total of 20 transects were completed aboard the R/V Aleutian Tern. One was done in the Kodiak Island region, two in the Fox Islands, one in the Andreanof Islands, five in the Delarof Islands and eleven in the Rat Islands during the period between 26 July and 23 August. Use of the Tern was limited so more transects could not be completed. The results of the transects completed in 1980 are summarized in tables 39 through 43 and figures 30 through 35. Exact transect locations are summarized in table 44.

D. Rare Bird and Unusual Observations

Cassin's auklets were found to be nesting on Ulak Island when the nesting plots were set up on 14 July 1980. This is only the second documentation of nesting by this species in the Aleutian Islands. The only other site where nests have been observed in the Aleutians was on Buldir Island in 1978.

Five Aleutian Canada geese were observed on North Island, Bay of Islands, Adak on 7 June. Of the five observed, one was a sub-adult and the remainder adults. One of the birds also wore a red leg band. A return visit was made on 16 June to search for nests. Although well used by the geese, as evidenced by the large amount of droppings, no nests were found.

Table 39. Pelagic Bird-Transects in the Kodiak Island Region, 1980.

(N=1, 11.351 birds/km^2)

Species	Frequency of Occurrence (Percent)
Auklet spp.	30
Tufted Puffin	20
Murre spp.	20
Northern Fulmar	20
Fork-tailed Petrel	10

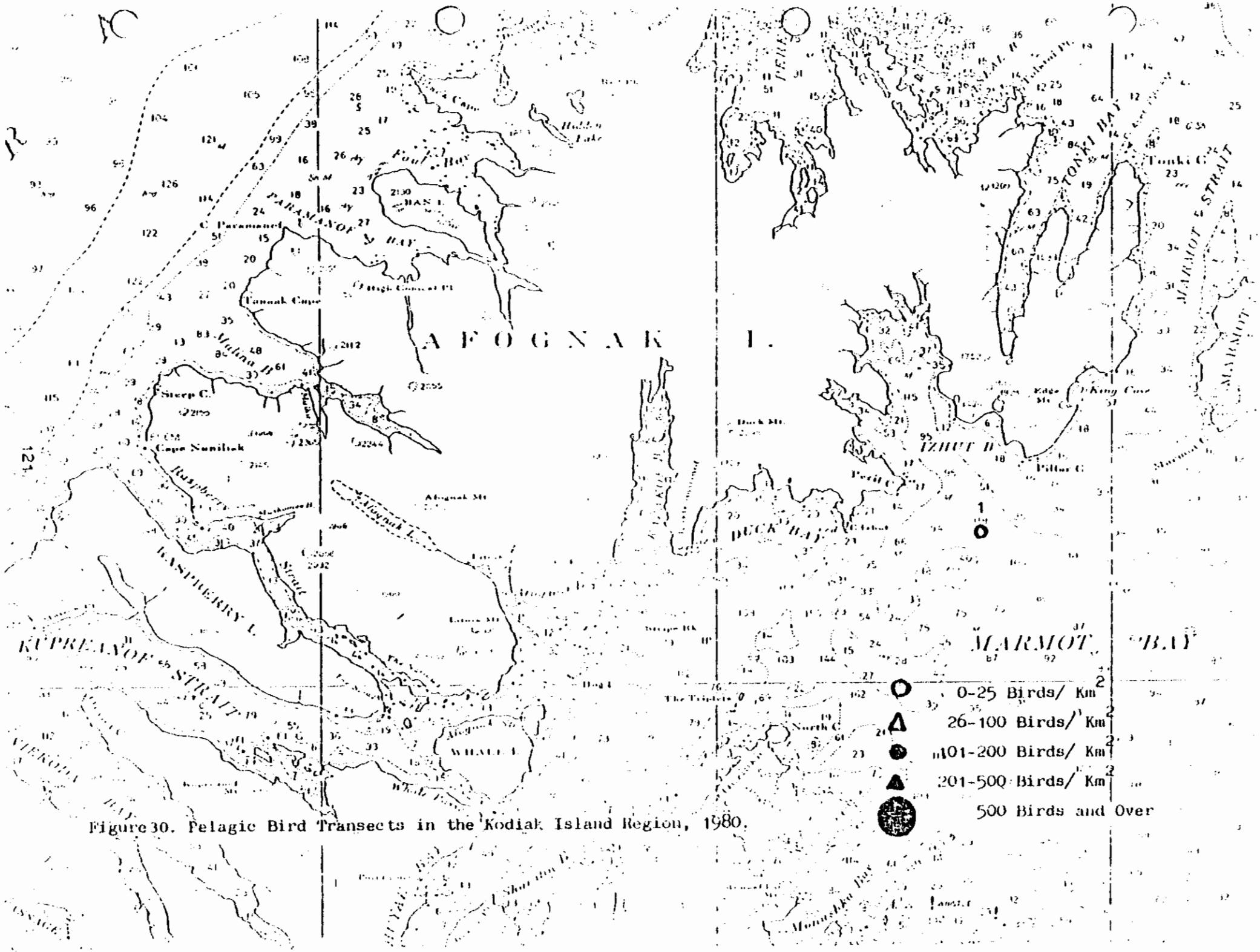


Figure 30. Pelagic Bird Transects in the Kodiak Island Region, 1980.

Table 40. Pelagic Transects in the Fox Island, 1980.

($N=2$, $\bar{x}=28.4$ birds/km^2)

Species	Frequency of Occurrence (Percent)
Fork-tailed Petrel	32
Tufted Puffin	28
Northern Fulmar	26
Murre spp.	6
Shearwater spp.	4
Horned Puffin	2
Glaucous-winged Gull	2

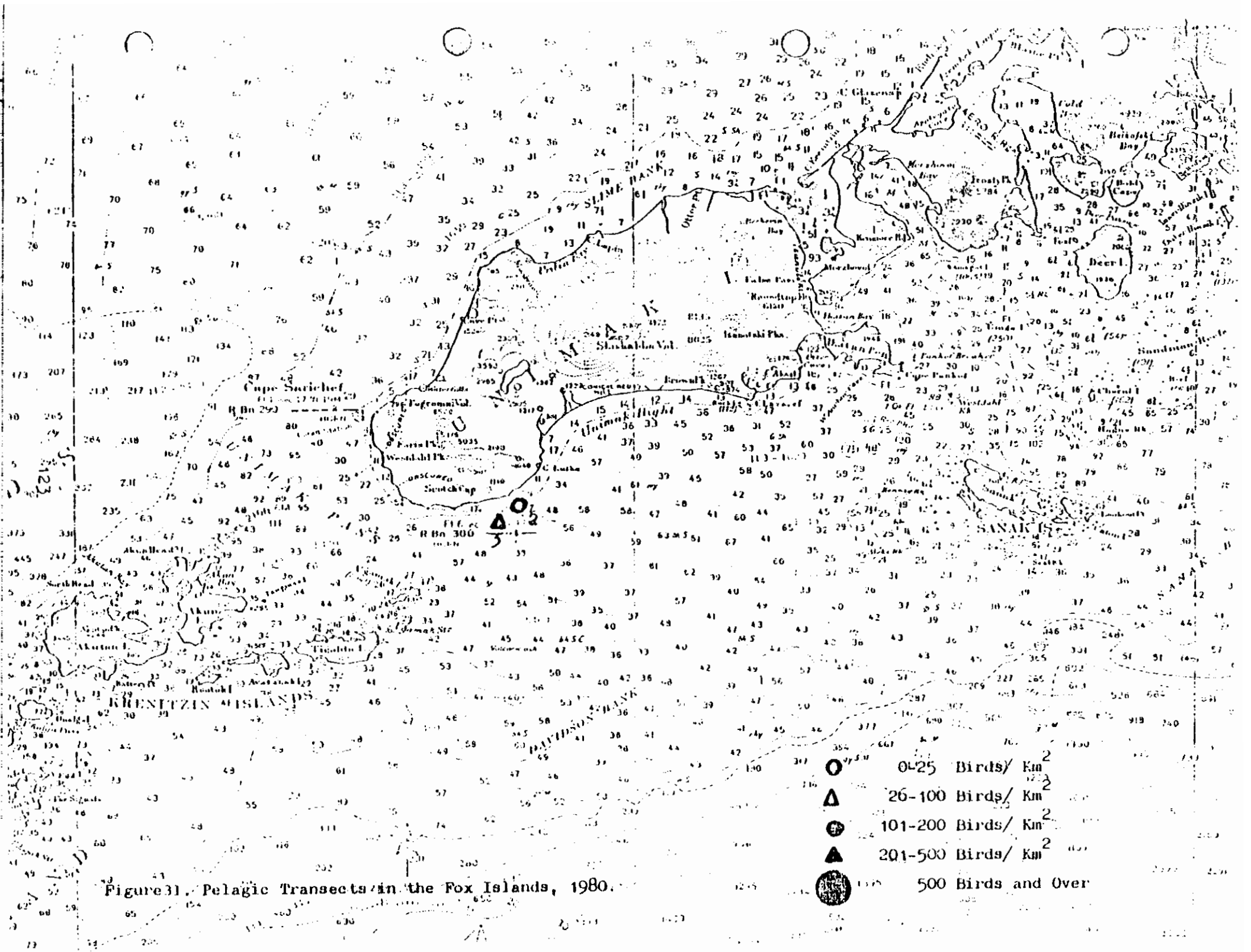


Figure31. Pelagic Transects in the Fox Islands, 1980.

Table 41. Pelagic Transects in the Andreanof Island, 1980.

(N=1, 297.4 birds/km^2)

Species	Frequency of Occurrence (Percent)
Northern Fulmar	95
Glaucous-winged Gull	4
Tufted Puffin	0.7
Cormorant spp.	0.3

Figure 32. Pelagic Transects in the Andreanof Islands, 1980.

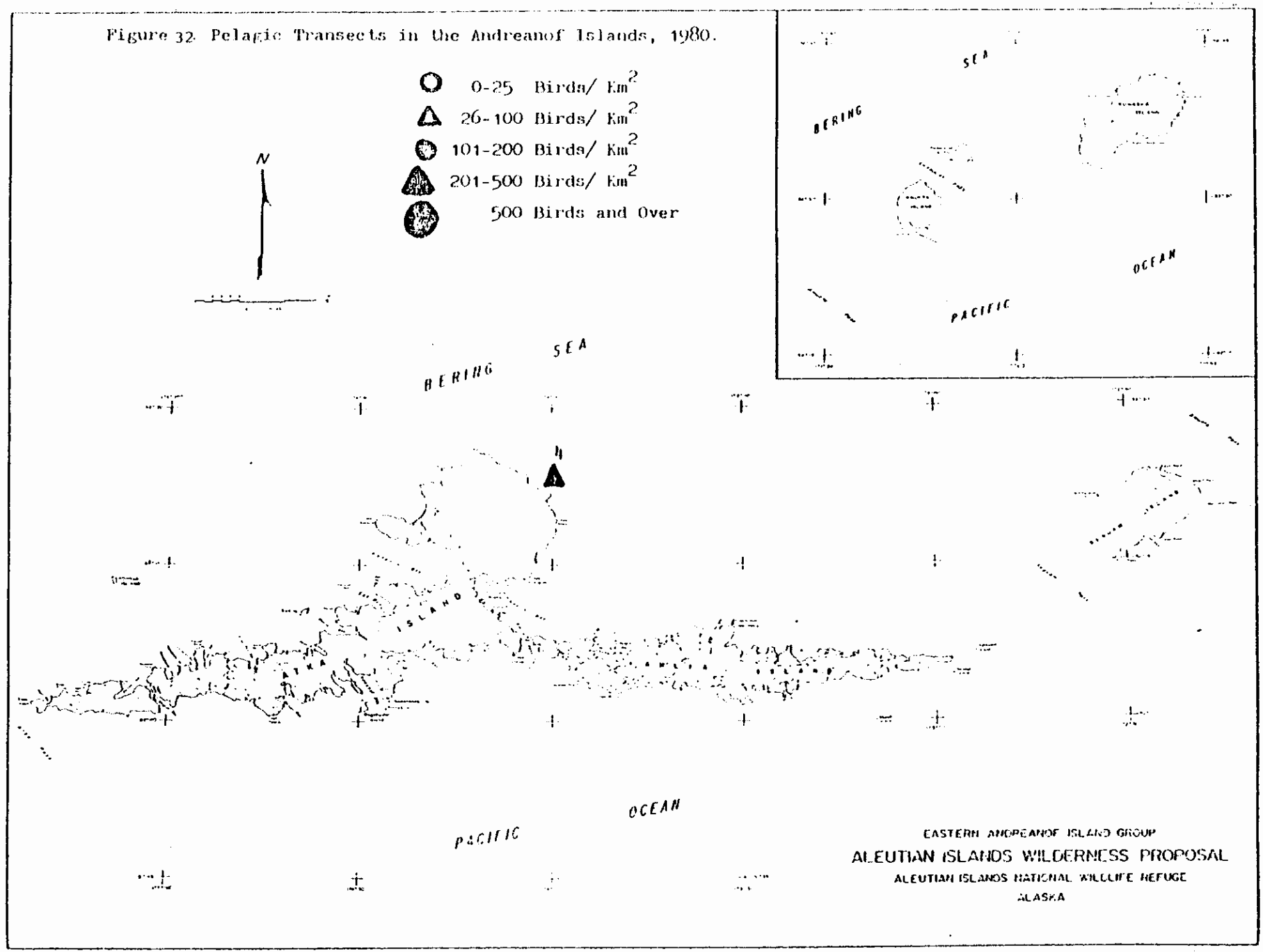


Table 42. Pelagic Bird Transects in the Delarof Island, 1980.

($N=5$, $\bar{x}=9.1$ birds/km^2)

Species	Frequency of Occurrence (Percent)
Northern Fulmar	68
Tufted Puffin	15
Fork-tailed Petrel	11
Auklet spp.	3
Surf Scoter	3

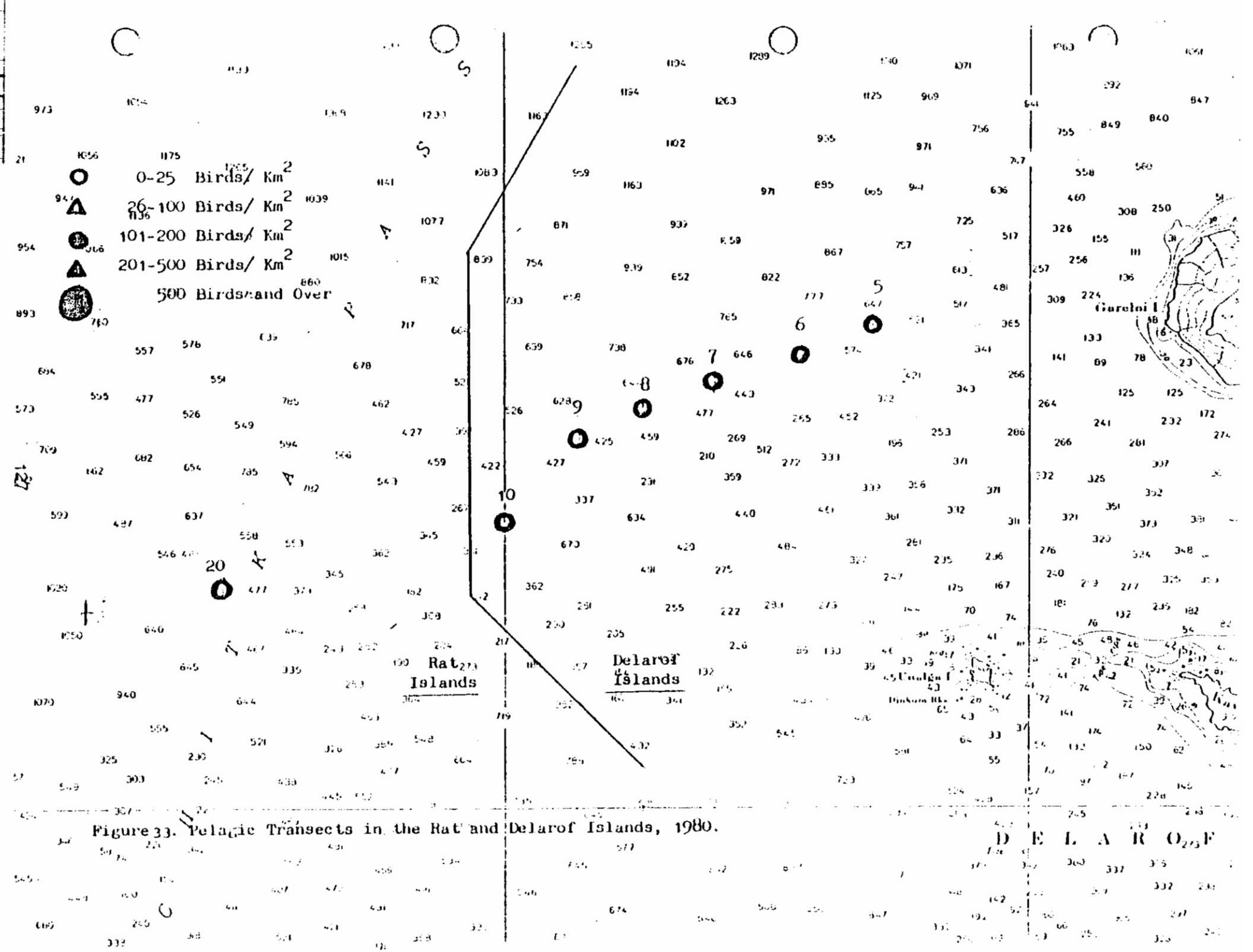
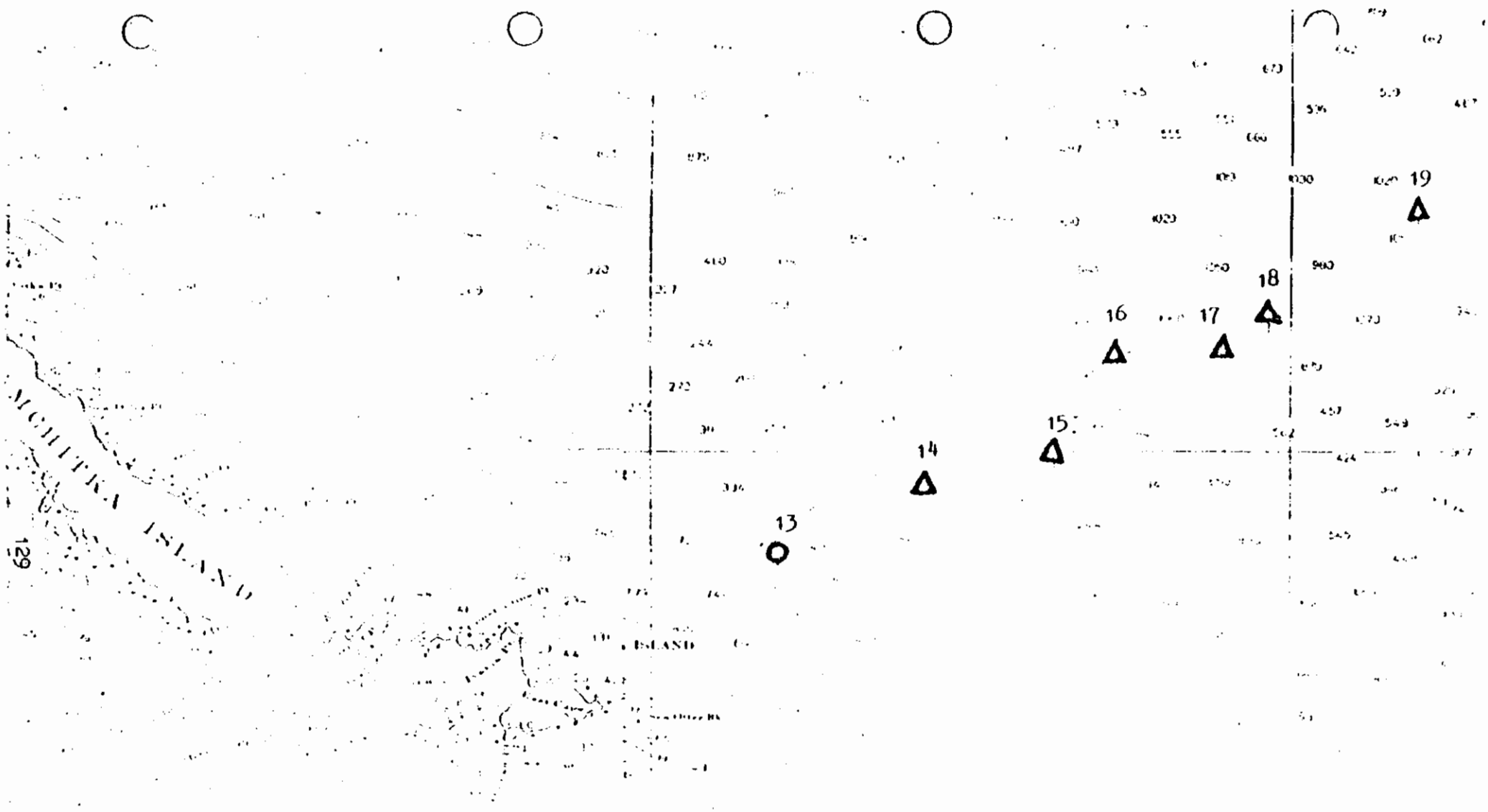


Figure 33. Pelagic Transects in the Rat and Delarof Islands, 1980.

Table 43. Pelagic Bird Transects in the Rat Islands, 1980.

(N=11, $\bar{x}$=34.0 birds/km^2)

Species	Frequency of Occurrence (Percent)
Northern Fulmar	33
Fork-tailed Petrel	32
Shearwater spp.	16
Auklet spp.	8
Tufted Puffin	4
Glaucous-winged Gull	4
Black-footed Albatross	1
Unknown species	1
Black-legged Kittiwake	0.6
Crested Auklet	0.4



0-25 Birds/ Km^2
26-100 Birds/ Km^2
101-200 Birds/ Km^2
201-500 Birds/ Km^2
500 Birds and Over

Figure 34. Pelagic Transects in the Rat Islands, 1980.

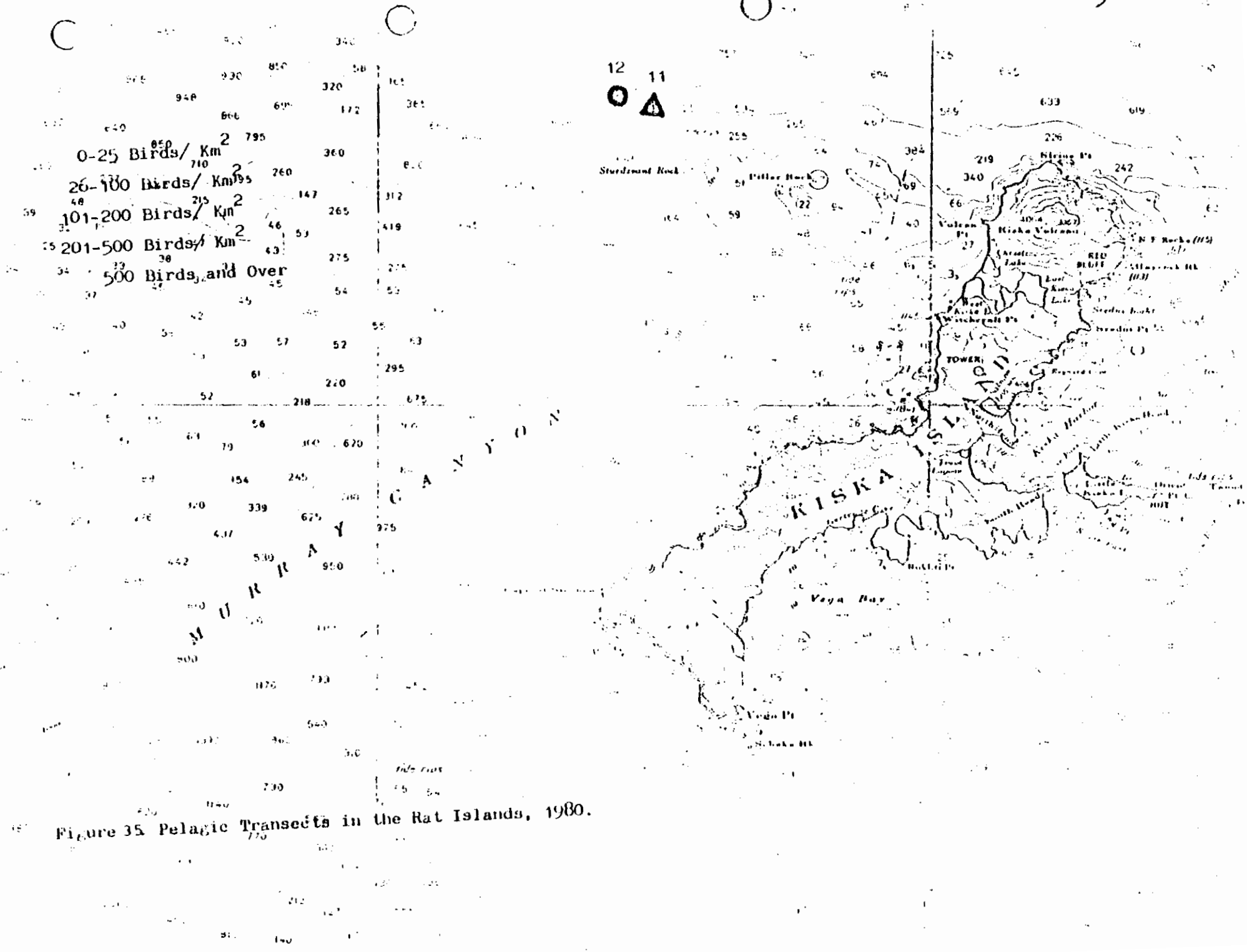


Figure 35 Pelagic Transects in the Rat Islands, 1980.

Table 44. Individual Transect Locations Within Island Groups, Summer, 1980.

Transect #	Longitude	Latitude
	KODIAK	
1	58° 06'N	152° 10'W
	FOX	
2	54° 24'N	164° 25'W
3	54° 22'N	164° 28'W
	ANDREANOF	
4	52° 24'N	174° 00'W
	DELAROF	
5	51° 47'N	179° 09'W
6	51° 46'N	179° 13'W
7	51° 45'N	179° 18'W
8	51° 44'N	179° 22'W
9	51° 43'N	179° 26'W
	RAT	
10	51° 40'N	179° 30'W
11	52° 10'N	177° 15'E
12	52° 10'N	177° 13'E
13	51° 27'N	179° 36'E
14	51° 29'N	179° 43'E
15	51° 30'N	179° 49'E
16	51° 33'N	179° 52'E
17	51° 33'N	179° 57'E
18	51° 34'N	179° 59'E
19	51° 37'N	179° 54'W
20	51° 38'N	179° 46'W

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APPENDICES I AND II ARE IN THE ORIGINAL AND REFUGE FIELD COPIES ONLY