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BIRD AND MAMMAL OBSERVATIONS AT NIZKI AND ALAID ISLANDS, ALEUTIAN  
ISLANDS, ALASKA  
SPRING AND SUMMER 1990

Donna O'Daniel and Scott Richardson

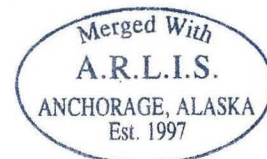
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Nizki and Alaid islands (Fig. 1) were selected as a study area in 1975 to document the response of native bird populations after removal of introduced arctic foxes (Alopex lagopus). Fox removal was planned for a number of Aleutian Islands to restore native birds including Aleutian Canada geese (Branta canadensis leucopareia), but resources precluded tracking the effects of this management action at all sites.

Foxes were removed from Nizki and Alaid in 1975 and 1976, and periodic bird surveys have been conducted subsequently to evaluate trends (Trapp 1975 and 1985, Day et al, 1979, Early et al. 1980, Zeillemaker 1983, and Zeillemaker and Trapp 1986). In 1990 we visited Nizki and Alaid to assess trends in nesting species over the past 15 years. This report summarizes our findings.

#### STUDY AREA AND METHODS

Nizki and Alaid islands are connected to each other by a low sandy berm which is occasionally breached, at least in winter. The areas of each islands are similar, about 600 ha (1,500 acres), but Nizki's local relief is less than 60 m (200 feet) whereas Alaid rises to 190 m (645 feet). The coastline of Nizki is more irregular than that of Alaid (Figs. 2 and 3). Both islands have numerous offshore islets and rocks, particularly along the north shorelines.

Plant communities are similar to those elsewhere in the Aleutians, being dominated by a tall, plant associations of grasses (e.g., Elymus and Calamagrostis) and umbellifers (e.g.,

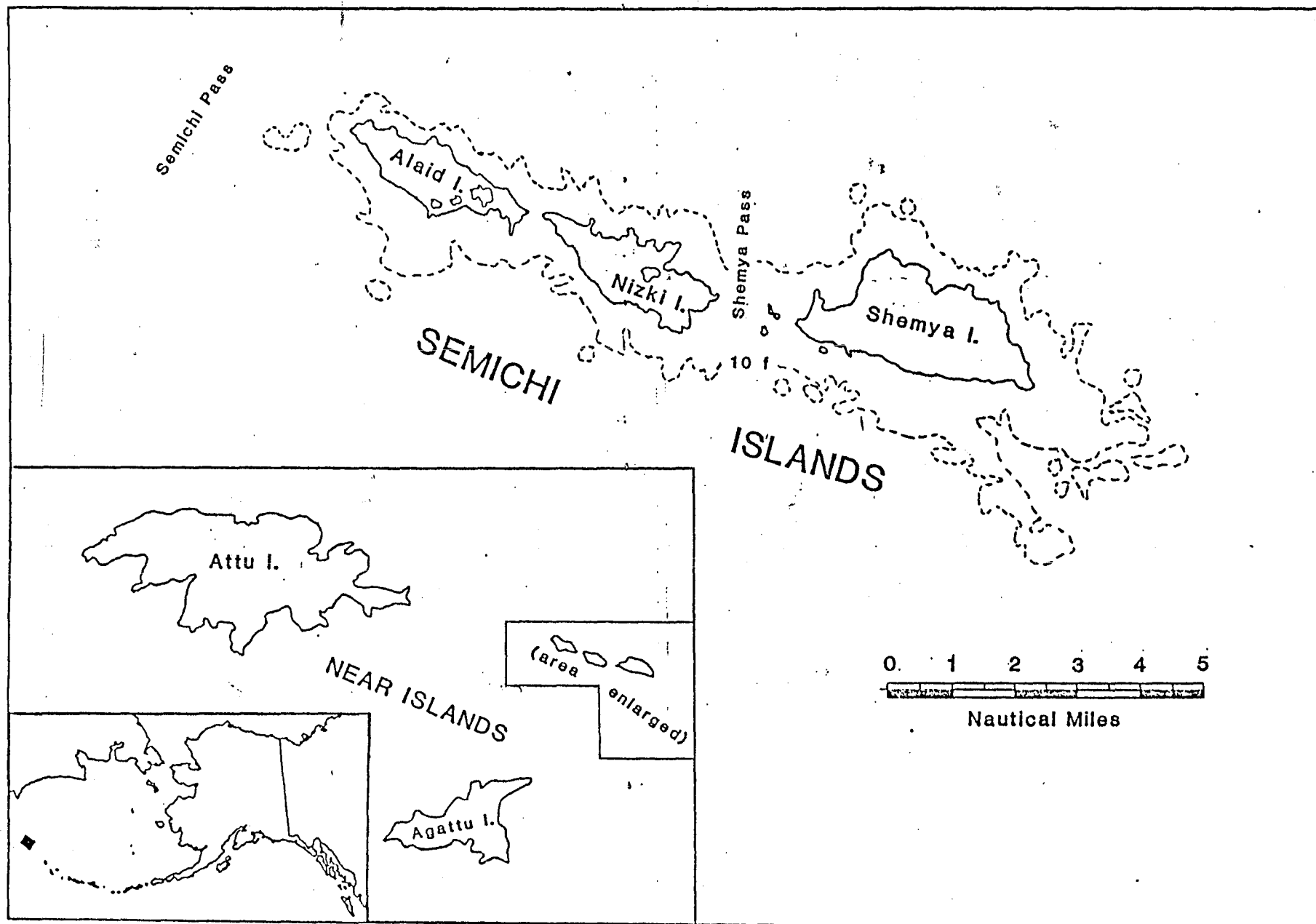


Figure 1. Location of Nizki and Alaid islands in the western Aleutian Islands, Alaska (traced from NOAA/NOS nautical chart 16421, dated 1976).

Figure 2. Place names of Nizki Island.

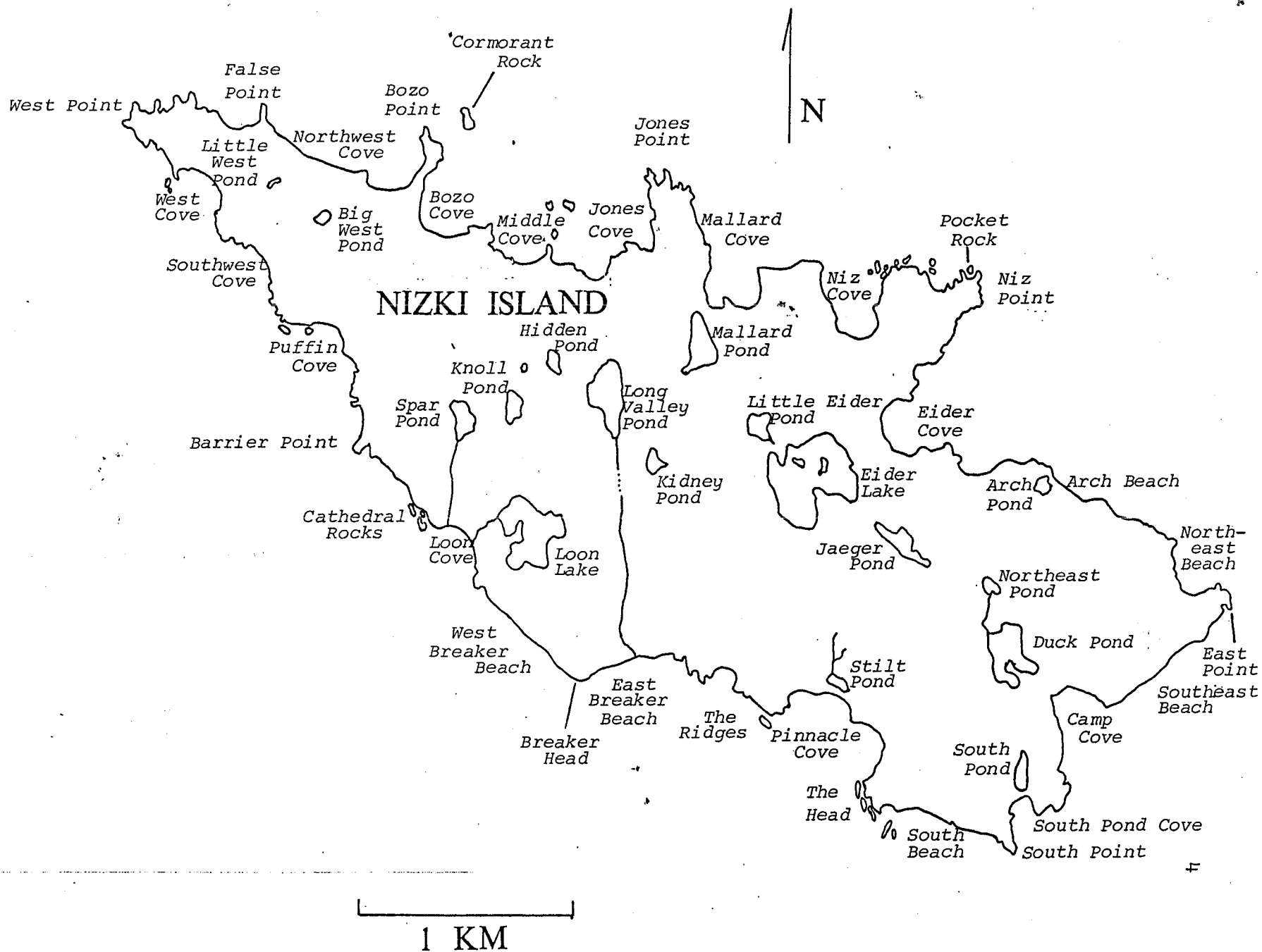
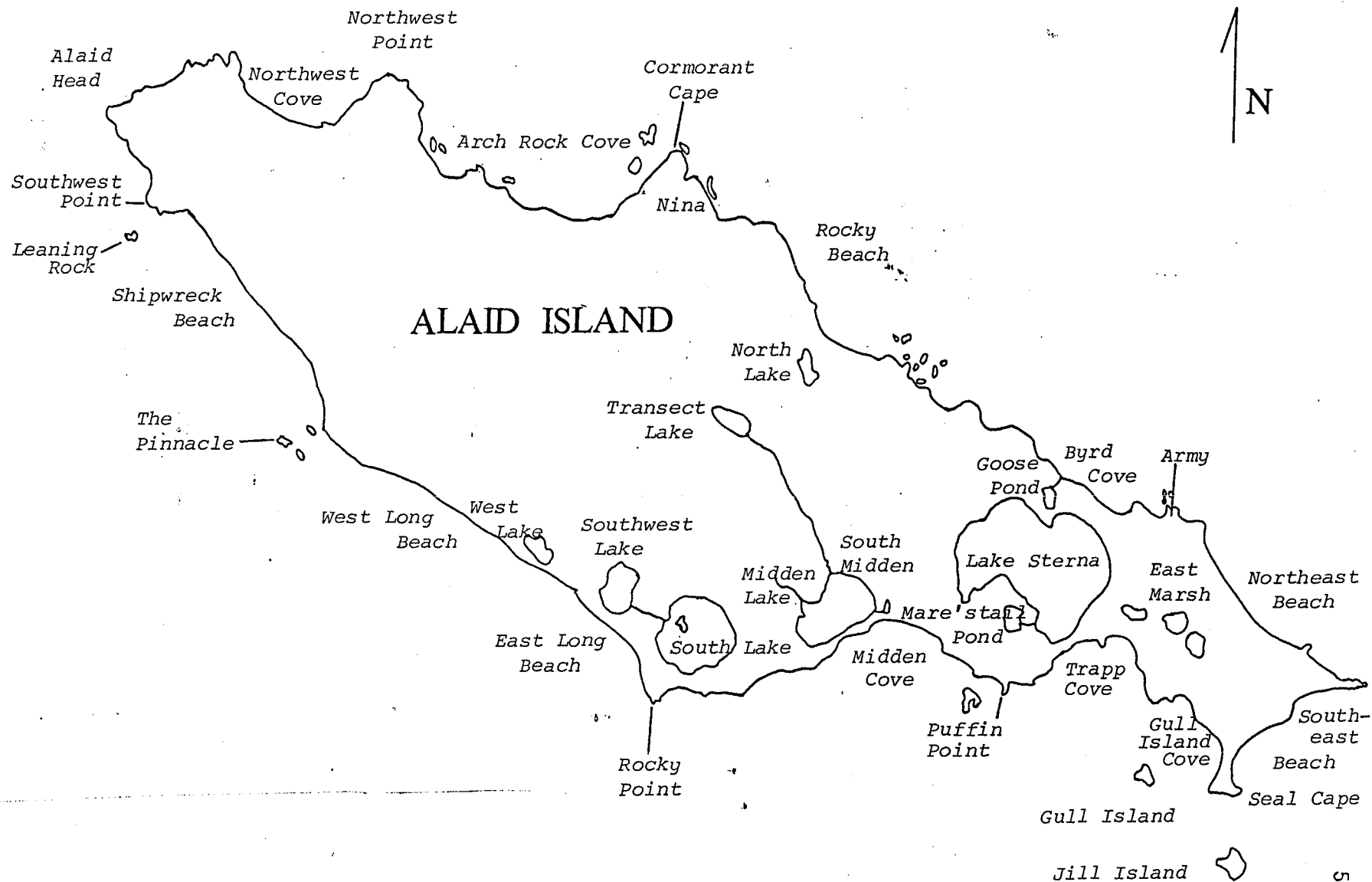


Figure 3. Place names of Alaid Island.



1 KM

Heracleum and Angelica) near the coast which gives way to a shorter plant complex including crowberry (Empetrum nigrum).

Few seabirds or waterfowl nested on Nizki or Alaid prior to fox removal, but remnant populations of several species persisted on offshore islets (Trapp 1975).

Field work surveys were conducted May 31 to June 26 and August 2-18, 1990. Two observers operated from a base camp at Bozo Cove (Fig. 2). To facilitate record keeping and reporting, names were assigned to prominent locations (Figs. 2 and 3). The following survey methods were employed. They duplicate, as far as possible, techniques used in prior surveys.

#### Shoreline Surveys

We walked the perimeter of each island along the beach or, where beaches were inaccessible, atop the coastal bluffs. The entire shoreline of each island was covered with the exception of the western end of Alaid, from Cormorant Cape around Alaid Head to the west end of Shipwreck Beach. To simplify recording and reporting of data, shorelines were divided into segments of variable lengths (Figs. 4 and 5). During shoreline surveys all birds observed were recorded, regardless of whether they were sitting on land, swimming in the water, or flying. For cormorants, nests and birds were recorded, and cormorant colonies were delineated. For tufted puffins, burrows as well as birds were counted and colonies were photographed and delineated.

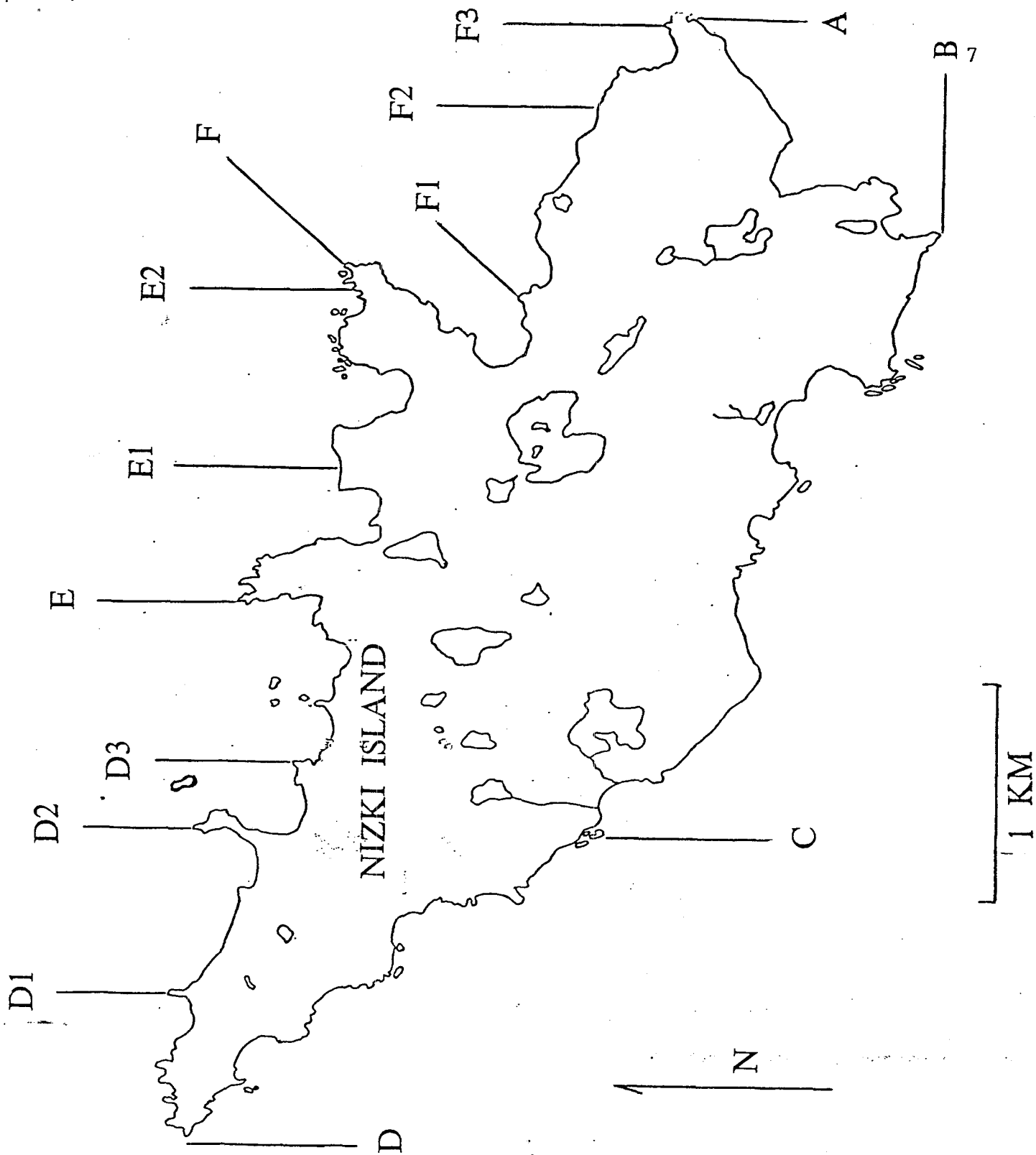
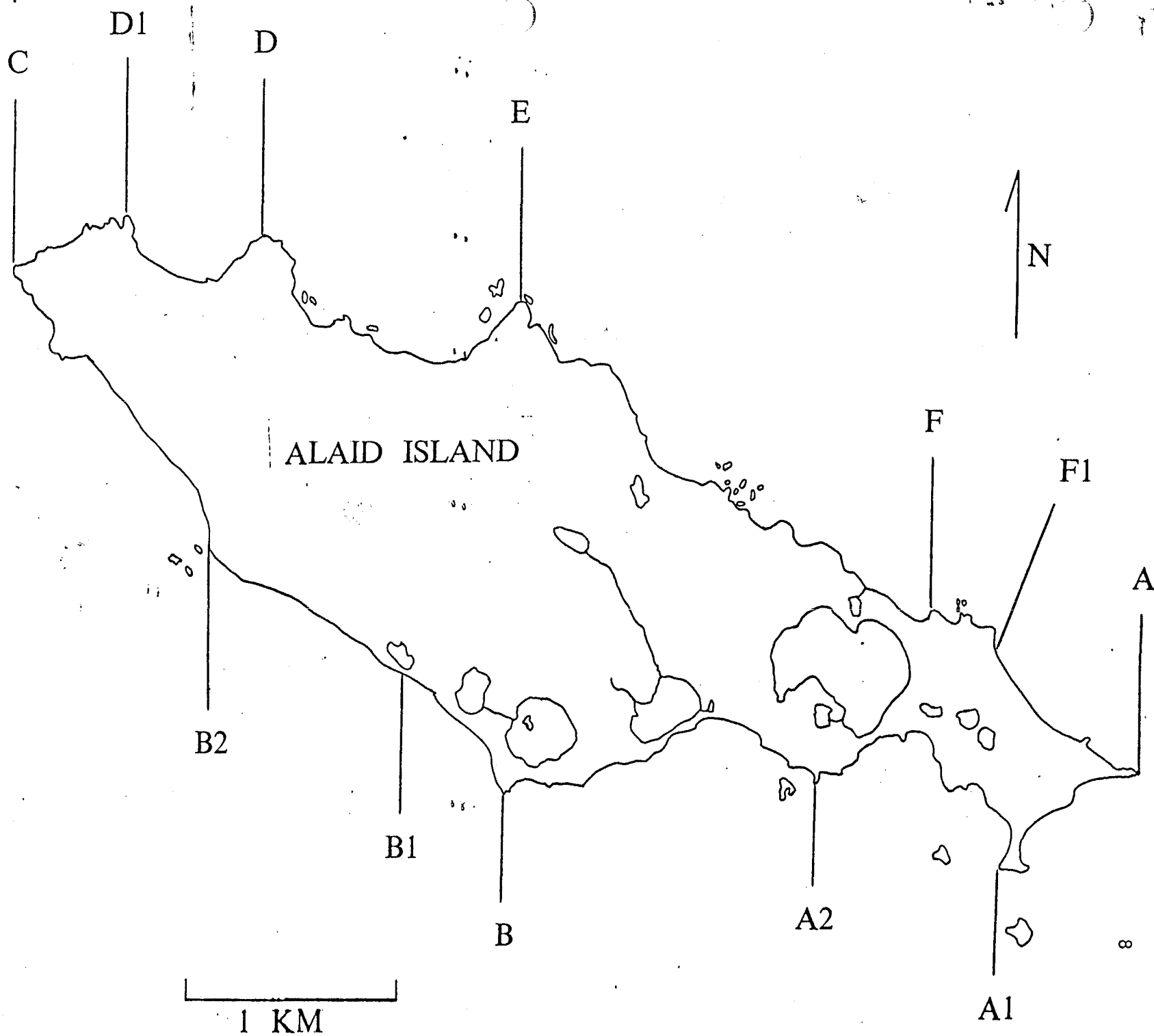


Figure 4. Segments for shoreline and nearshore boat surveys on Nizki I., Alaska, in 1990.

Figure 5. Segments for shoreline and nearshore boat surveys on Alaid I., Alaska, in 1990.





### Nearshore Boat Surveys

An inflatable Zodiac was used on the afternoon of June 22 to do a complete circumnavigation of each island (Figs. 6 and 7). We did not attempt to record numbers of cormorants and nests or eiders except in those areas around the western end of Alaid which were not covered by the shoreline survey and those areas on the seaward-facing side of offshore rocks which were not visible from land. All other species of birds and marine mammals seen were recorded.

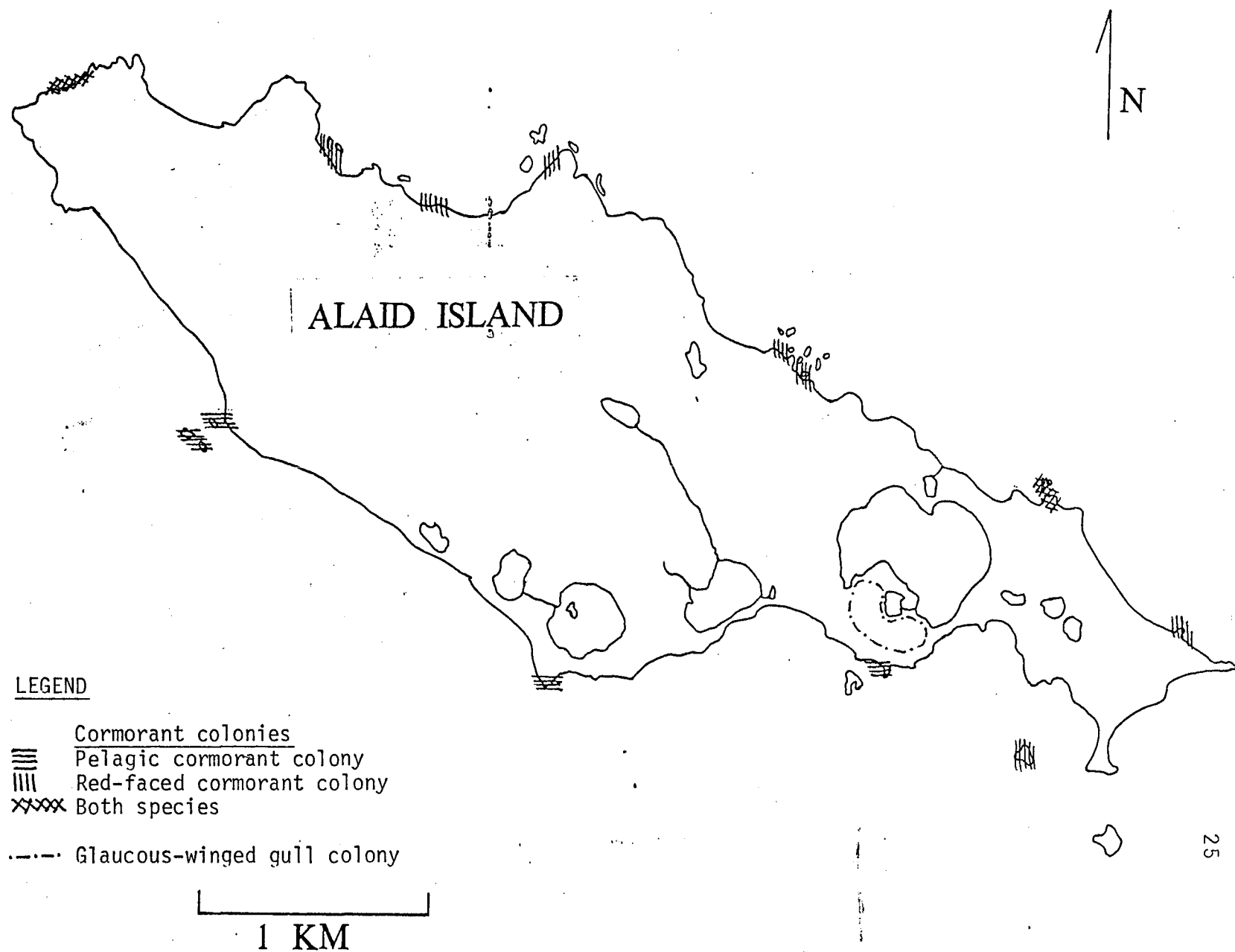
### Lake Surveys

Waterbird use was documented by walking the perimeter (all sloping banks, and where the terrain was level from the shoreline, 5 meters away from the shore) of all lakes and ponds, recording all birds in the immediate vicinity. All nests and contents were recorded and for common eiders and glaucous-winged gulls, were delineated on a map. Replicate survey of some lakes and ponds were made opportunistically during other field activities. Egg float tests were conducted on common eider eggs encountered around lake perimeters to estimate chronology of nesting.

### Goose Nest Searches

We walked abreast approximately 5m apart through most of the tall vegetation on each island, searching for Aleutian Canada goose nests. When nests were found egg float angles and characteristics of the nesting habitat (e.g., slope, aspect) were

Figure 12. Location of cormorant and gull colonies on Alaid Island.



a

Table 5. Comparison of abundance of cormorants and nests at Nizki-Alaid from 1975-1990.

<u>Pelagic cormorant</u>						
Year	Nizki		Alaid		Totals for Nizki-Alaid	
	Nests	Birds	Nests	Birds	Nests	Birds
1975-76	42+	200	23	100	65	300
1984	396	792	77	154	473	946
	b	c	d	e		
1990	239	945	121	383	360	1328

Red-faced cormorant

Year	Nizki		Alaid		Totals for Nizki-Alaid	
	Nests	Birds	Nests	Birds	Nests	Birds
		f		f		f
1975-76	169	300	926	2700	1095	3000
1984	1288	2576	417	834	1705	3410
			g	h		
1990	796	2382	422	1046	1218	3428

a

Data is from the following sources: 1975--Trapp (1975), 1976--Trapp (1985), 1979--Early et al. (1980), 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

b

Includes 7 unidentified nests.

c

Includes 317 unidentified cormorants.

d

Includes 15 unidentified cormorants nests.

e

Includes 199 unidentified cormorants plus 12 PECO's counted on nearshore boat survey not counted on shoreline survey.

f

Population estimate.

g

Includes 113 nests counted on nearshore boat survey not counted on shoreline survey.

h

Includes 301 birds counted on nearshore boat survey not counted on shoreline survey.

Table 6. Comparison of abundance and distribution of cormorants observed on shoreline surveys on Nizki Island in 1984 and 1990.

Location	Segments	a, b		b		
		1984		1990		
		<sup>c</sup> PECO	<sup>c</sup> RFCO	<sup>c</sup> PECO	Corm. Sp.	<sup>c</sup> RFCO
West Point-False Point	(D-D <sub>1</sub> )	-	408 (204)	-	-	119 (32)
Northwest Cove	(D <sub>1</sub> -D <sub>2</sub> )	40 (20)	354 (177)	-	-	109 (72)
Bozo Cove-Middle Point	(D <sub>2</sub> -D <sub>3</sub> )	9 (4)	490 (245)	-	-	81 (38)
Jones Cove-Jones Point	(D <sub>3</sub> -E)	-	-	2	-	281 (71)
Mallard Cove	(E-E <sub>1</sub> )	8 (4)	38 (19)	-	-	60 (3)
Niz Cove	(E <sub>1</sub> -E <sub>2</sub> )	138 (69)	32 (16)	8 (2)	-	312 (146)
Pocket Rock-Niz Point	(E <sub>2</sub> -F)	114 (57)	332 (166)	38 (13)	-	305 (97)
Eider Cove	(F-F <sub>1</sub> )	-	-	11 (2)	-	20 (2)
Arch Beach	(F <sub>1</sub> -F <sub>2</sub> )	140 (70)	44 (22)	186 (74)	-	150 (20)
Northeast Beach	(F <sub>2</sub> -F <sub>3</sub> )	10 (5)	96 (48)	1	-	130 (30)
East Point	(F <sub>3</sub> -A)	12 (6)	58 (29)	24 (1)	40	50 (13)
Southeast Beach-South Pond Cove	(A-B)	110 (55)	228 (114)	151 (83)	132	400 (113)
South Point-Loon Cove	(B-C)	200 (100)	276 (138)	66 (13)	-	46 (30)
Cathedral Rocks West Point	(C-D)	11 (5)	220 (110)	141 (44)	145 (7)	319 (129)
	Total	792 (401)	2576 (1288)	628 (232)	317 (7)	2382 (796)

a

Zeillemaker and Trapp, 1986.

b

Numbers in parentheses are nests.

c

PECO = Pelagic cormorant; RFCO = Red-faced cormorant.

larger bright-billed red-faced cormorant would have been easier to discern, so distant birds that were not definitive probably were mostly pelagics.

It appears red-faced cormorants populations have not changed substantially since foxes were removed, probably because this species tends to nest on offshore islets and vertical cliffs, mostly inaccessible to foxes. Pelagic cormorants have increased substantially since fox removal. This species is using some areas that would have been easily accessible to foxes.

Fewer cormorant nests were counted in 1990 than in 1984 (Table 5). A comparison of areas on Nizki and Alaid suggest shifting because some colonies increased while others declined (Table 6 and 7). There is no apparent reason for a decline in nests, but little is known about how nesting effort varies for a given population size among years.

A check of a sample of cormorant nests in August suggested that most of the nests contained young (Table 8). Red-faced cormorants had larger broods than pelagic cormorants at Nizki in 1990 (Table 8).

Canada Goose--In 1990, we located a total of 8 nests and found indirect evidence of 2 others. In 1987, a brood was sighted (Estes, per. comm.) and this was the first evidence of breeding on the islands since the removal of arctic foxes in 1976. Since 1987, nests have been found in each year (2 in 1988 and 8 in 1989). Detailed information regarding the

Table 7. Comparison of abundance and distribution of cormorants observed on shoreline survey on Alaid Island in 1984 and 1990.

Location	Segments	a,b		a		
		1984		1990		
		<sup>c</sup> PECO	<sup>c</sup> RFCO	<sup>c</sup> PECO	Corm. Sp.	<sup>c</sup> RFCO
Northeast Beach- Lookout Point	(A-F)	-	226(113) <sup>a</sup>	24 (16)	-	130 (20)
Rocky Beach	(E-F)	22(11)	192 (96)	28 (23)	26(10)	247(133)
Northwest Cove	(D-D <sub>1</sub> )	-	100 (50)	-	-	110 (85)
West Long Beach- Rocky Point	(B <sub>2</sub> -B)	42(21)	-	-	-	19
Rocky Point- Puffin Point	(B-A <sub>2</sub> )	90(45)	88 (44)	70 (57)	173 (5)	5 (2)
Trapp Cove- Gull Island Cove	(A <sub>1</sub> -A <sub>2</sub> )	-	<u>128 (64)</u>	<u>44 (10)</u>	-	<u>234 (69)</u>
Total		154(77)	734(367)	166(106)	199(15)	745(309)

a

Numbers in parentheses are nests.

b

Zeillemaker and Trapp (1986).

c

PECO = Pelagic cormorant; RFCO = Red-faced cormorant.

Table 8. Frequency distribution of cormorant chicks in nests observed on Nizki in August 1990.

Nest Contents	Red-faced cormorant nests	Pelagic cormorant nests
Empty	11	10
1 chick	16	7
2 chicks	24	27
3 chicks	35	20
4 chicks	<u>31</u>	<u>4</u>
Total	117	68
Mean chicks <sup>a</sup>	2.76	2.36
s	1.04	0.79
90% C.B.	0.17	0.17
Mean nest success <sup>b</sup>	0.91	0.85

<sup>a</sup> Chicks/nest with  $\geq 1$  chick

<sup>b</sup> Proportion of nests with  $\geq 1$  chick

results of the survey conducted in 1990 on Nizki-Alaid is reported elsewhere (O'Daniel and Richardson 1990). Both banded and unbanded geese were observed in virtually all habitat types. A translocation project was undertaken in August and 38 birds, captured and banded at Buldir Island, were released at Mallard Pond, Nizki, and subsequently monitored (O'Daniel and Byrd 1990). Besides the 16 geese associated with 8 nests, at least 19 additional birds could be accounted for in June, around Loon Lake on Nizki.

Green-winged Teal--A total of 14 birds was recorded at 5 lakes on Nizki and 3 on Alaid (Tables 9 and 10). Even though the birds were observed on the same number of lakes as in 1984, the total population seen was lower than in 1984 (Table 9). The primary reason for the lower count may have been the timing. Counts were later in 1990 than in 1984, so nesting teal were less conspicuous during the 1990 survey. Three broods of teal were seen on Nizki and one was recorded on Alaid (Table 1). Teal have increased substantially on Nizki and Alaid since foxes were removed (Table 4).

Mallard--Birds were observed on 12 lakes in 1990, an increase of almost 100% from 1984 (Tables 9 and 10). We recorded 23 birds (Tables 4, 9 and 10), a slight increase from 1984, and perhaps the increase was even greater for



Table 10. Abundance and distribution of ducks on lakes and ponds on Nizki-Alaid in 1990.

Island	Lakes	Mallard	Green-winged Teal	Common Eider
Nizki	Little West	1	1	1
	Big West	0	0	1
	Hidden	0	0	0
	Knoll	0	0	0
	Spar	0	0	0
	Loon	2	1	11
	Long Valley	0	0	1
	Mallard	2	0	7
	Kidney	0	0	0
	Little Eider	0	0	0
	Eider	2	0	1
	Jaeger	3	0	1
	Stilt	2	2	0
	Northeast	0	0	0
	Duck	2	1	4
	South	0	0	3
	Arch	<u>2</u>	<u>2</u>	<u>0</u>
	Total	16	7	30
Alaid	West	0	0	1
	Southwest	0	0	0
	South	0	3	0
	Midden	0	0	0
	South Midden	0	0	0
	Mare's Tail	0	0	3
	Sterna	2	2	9
	East Marsh	2	2	0
	Goose	0	0	0
	North	2	0	2
	Transect	<u>1</u>	<u>0</u>	<u>0</u>
	Total	7	7	15

Table 9. Comparison of usage of lakes and ponds by ducks at Nizki-Alaid 1984 and 1990.

Species	Island	<sup>a</sup> 1984		1990	
		Lakes Recorded	Total Birds	Lakes Recorded	Total Birds
Mallard	Nizki	5	8	8	16
	Alaid	<u>2</u>	<u>12</u>	<u>4</u>	<u>7</u>
	Both	7	20	12	23
Green-winged Teal	Nizki	6	9	5	7
	Alaid	<u>2</u>	<u>21</u>	<u>3</u>	<u>7</u>
	Both	8	30	8	14
Common Eider	Nizki	8	28	9	30
	Alaid	<u>5</u>	<u>13</u>	<u>4</u>	<u>15</u>
	Both	13	41	13	45

<sup>a</sup>

Zeillemaker and Trapp (1986).

the same reasons of survey timing mentioned for teal above. Counts have doubled since 1975 (Table 4). Three broods of mallards were seen at Nizki in 1990 (Table 11).

Common Eider--Our observations indicated a total of 1097 birds, seen on shoreline and coastline surveys, and using the freshwater lakes (Table 4). Fewer than half the birds seen on Nizki in 1984 were observed there this year and only approximately one-third as many were seen on Alaid (Tables 12 and 13). The numbers of eiders observed on 12 of 19 shoreline survey segments declined by more than half (Tables 12 and 13). This probably can be accounted for by the fact that the 1984 survey was conducted in late May when the eiders were rafting in the waters surrounding the islands before coming ashore to breed. The 1990 survey was done after egg-laying and incubation had begun, and approximately 3 times as many males as females were observed on the shoreline surveys for each island.

Usage of lakes and ponds nearly doubled between 1984 and 1990 even though the number of lakes being used by eiders remained the same (Table 9). There was twice as many nests found incidentally as in 1984, but we were on the islands for a greater period of time and the surveys were done later in the breeding season. The 105 nests found incidentally had a mean clutch size of 4.76 (Table 14). This compares favorably with the mean clutch size of 4.81 for the 26 nests with known contents in the 3 common eider

Table 11. Brood sizes of nesting waterfowl on Nizki-Alaid in 1990.

Island	Species	Date	Location	Size of Brood <sup>a</sup>
Nizki	Mallard	6-06	Loon Lake	2
	Mallard	6-09	Arch Pond	8
	Mallard	6-09	North of Mallard Pond	5
	Green-winged Teal	6-15	North of Camp Cove	3+
	Green-winged Teal	6-15	Stilt Pond	8
	Green-winged Teal	8-04	Mallard	2
Alaid	Green-winged Teal	6-18	Beach south of Lake Sterna	>1

<sup>a</sup>

One chick was dead.

a

Table 12. Comparison of abundance and distribution of common eiders observed on shoreline surveys on Nizki Island, 1983-1990.

Location	Segments	1983	1984	1990
West Point-False Point	(D-D <sub>1</sub> )	27	95	35
Northwest Cove	(D <sub>1</sub> -D <sub>2</sub> )	2	117	29
Bozo Cove-Middle Point	(D <sub>2</sub> -D <sub>3</sub> )	124	141	7
Jones Cove-Jones Point	(D <sub>3</sub> -E)	111	114	39
Mallard Cove	(E-E <sub>1</sub> )	81	115	79
Niz Cove	(E <sub>1</sub> -E <sub>2</sub> )	10	75	34
Pocket Rock-Niz Point	(E <sub>2</sub> -F)	134	88	11
Eider Cove	(F-F <sub>1</sub> )	131	236	67
Arch Beach	(F <sub>1</sub> -F <sub>2</sub> )	42	109	97
Northeast Beach	(F <sub>2</sub> -F <sub>3</sub> )	-	37	45
East Point	(F <sub>3</sub> -A)	45	7	30
Southeast Beach-South Pond Cove	(A-B)	74	63	78
South Point-Loon Cove	(B-C)	272	417	145
Cathedral Rocks-West Point	(C-D)	81	186	46
		<hr/>	<hr/>	<hr/>
	Total	1134	1800	742

a

Data is from the following sources: 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

Table 13. Comparison of abundance and distribution of common eiders observed on shoreline surveys on Alaid Island in 1984 and 1990.

Location	Segment	<sup>a</sup>	
		1984	1990
Northeast Beach- Lookout Point	(A-F)	72	21
Rocky Beach	(F-E)	265	61
West Long Beach- Rocky Point	(B <sub>2</sub> -B)	281	27
Rocky Point- Puffin Point	(B-A <sub>2</sub> )	87	53
Trapp Cove- Gull Island Cove	(A <sub>1</sub> -A <sub>2</sub> )	<u>13</u>	<u>31</u>
Total		718	193

<sup>a</sup>

Zeillemaker and Trapp (1986).

Table 14. Clutch sizes of common eider nests on Nizki-Alaid, 1990

Date	Clutch Size						
	1	2	3	4	5	6	7
June 1-3		1		9	13	4	1
4				2	1		
5				3	4	1	
6				1	7		
7				2			
9				1	5	1	
10					4		
13			2	3	6		
14					1		
15					7		
16				2	5		
18			1		2	2	
19					4		
20			1		2	1	
21				1	3		
23				1	1		
Total		1	4	25	65	9	1
<hr/>							
n		105					
x		4.76					
s		0.74					

plots established on Nizki in 1990 (Table 15). Nest success (proportion of nests containing evidence of  $\geq 1$  hatch) for the 3 plots was calculated at 0.90 (Table 15). In August, 112 ducklings were observed in creches ranging in size from 1 duckling and 1 adult female to 17 ducklings and 7 adult females. These were seen on the northeast and southeast coastlines of Nizki.

Peregrine Falcon--There was an active eyrie on Nizki in 1990, on the cliffs along the east side of Jones Cove (Cold Hill). This is only the second active eyrie located since bird populations have been monitored on these islands. Both adults were seen regularly in the vicinity of the nest and single birds were observed regularly in several areas along the north and east coastlines. In August, 2 adults and 2 fledgling peregrines were seen immediately above the eyrie indicating a successful nesting attempt. A single adult was observed at Barrier Point, Nizki, and its behavior suggested that there may have been an active eyrie in the vicinity. Another single bird was seen flying along Rocky Beach on the north side of Alaid. These sightings suggest an estimated total breeding population of 3 pairs.

Rock Sandpiper--A total of 13 rock sandpipers was observed during the lake surveys (on 5 lakes at Nizki and 3 lakes at Alaid). In addition, 1 to 2 individuals were regularly encountered in several places on each island, suggesting a



Table 15. Nesting success of common eiders in 3 plots on Nizki Island in 1990.

Plot	Location	Number of nests	Clutch size				Nests Rechecked	a Date	Number of Successful Nests	b
			4	5	6	?				
1.	Bozo Point <sup>c</sup>	11	3	7		1	9	8-4	7	
2	Mallard Pond <sup>d</sup>	7	1	6			6	8-4	6	
3	Loon Lake <sup>d</sup>	10	2	6	1	1	6	8-5	6	
	Total	28	6	19	1	2	21		19	
	Nest success								0.90	
	$\bar{x}$ =		4.81							
	s =		0.49							

a Some nests were not able to be relocated.

b Nests with  $\geq 1$  hatch.

c Figure

d Plot boundary includes sloping banks adjacent to lake and on level terrain, 0-5m away from the lake shore.

minimum population of 40 birds on both islands. A nest with 4 eggs was found on June 13 on top of the sea slope at The Ridges on Nizki under an anemone. On June 15, three 1-2 day-old chicks were seen along with 2 adults north of East Breaker Beach, Nizki. Population estimates of this species are imprecise, but suggest that the population has increased since foxes were removed, and has remained stable since 1984 (Table 4).

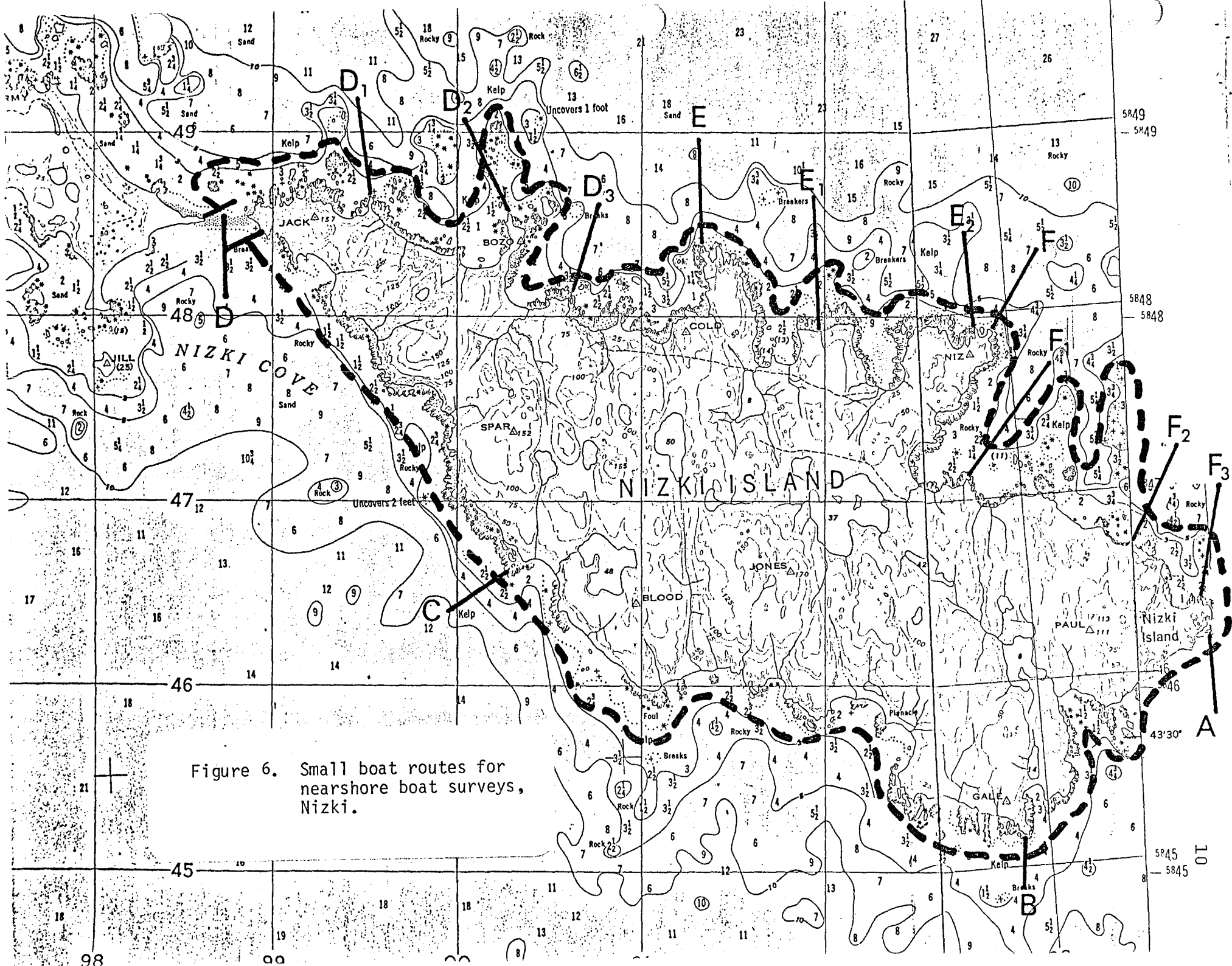
Parasitic Jaeger--The small number of jaegers observed on the shoreline and nearshore boat surveys (Appendices A - D) do not accurately reflect the abundance of this tundra-nesting species. Parasitic jaegers were recorded on 19 (90%) of 21 days afield and were observed on both islands. The percentage of days observed, total birds sighted, and birds/day were all greater in 1990 than in 1984, while the sightings/day remained the same (Table 16), indicating an increase in the population. The greatest number seen at one time was 8 in June and 19 in August. Juveniles were seen along with adults on at least 4 days between August 3-17. An adult was observed feeding a juvenile north of Loon Lake on August 14. We estimated that the 1990 population for Nizki-Alaid was roughly 32 birds, based on repeated observations of individuals and flocks in many different parts of each island. These population estimates suggest an approximate 30 percent increase in the population since 1984.

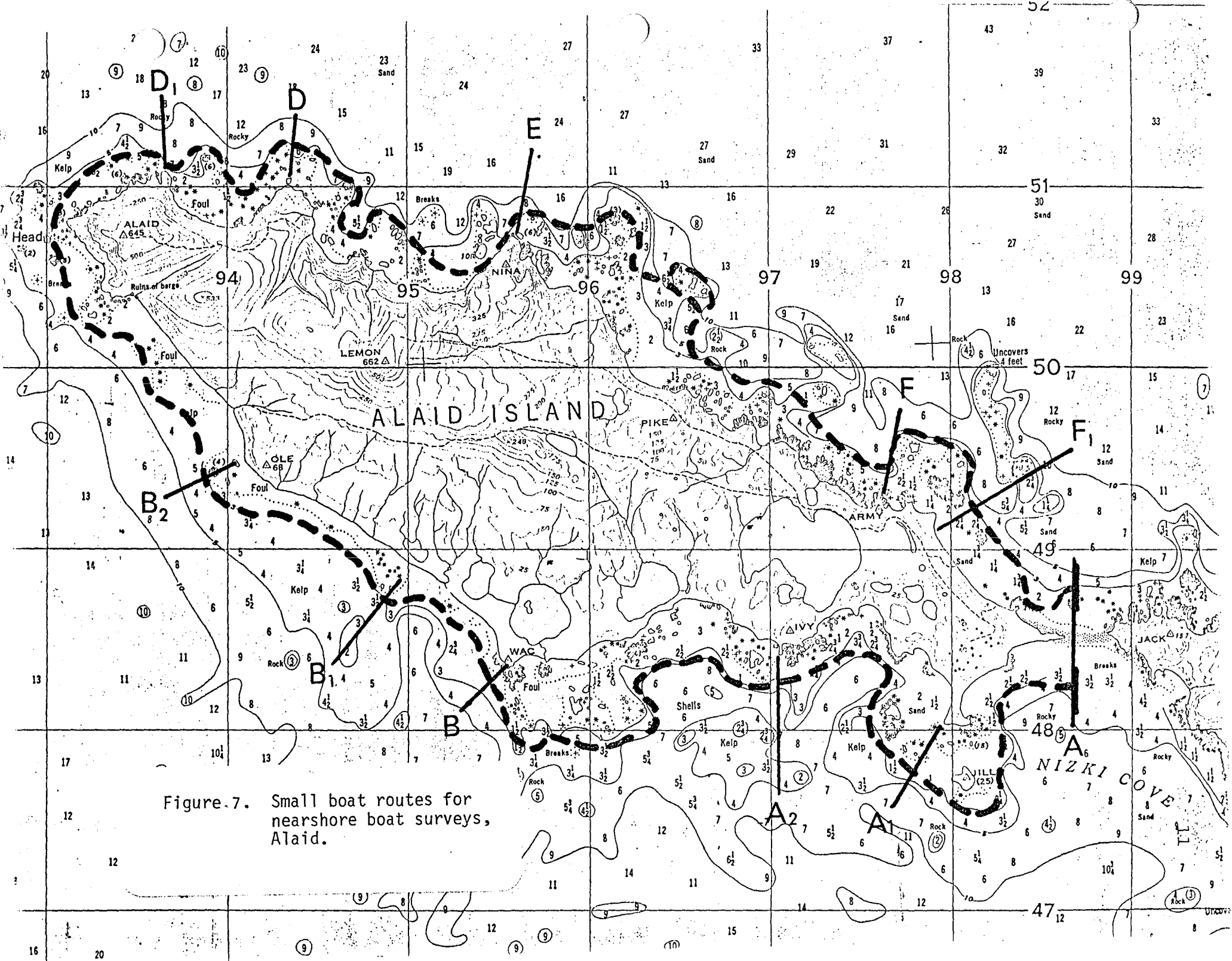
Table 16. Comparison of abundance of parasitic jaegers observed on Nizki-Alaid in 1984 and 1990.

	Year	
	<sup>a</sup> 1984	1990
% of days jaegers observed	73	90
Number of sightings	26	48
Sightings per day	2.4	2.5
Total birds sighted	45	138
Birds/sighting	1.7	2.9
Birds/day	4.1	7.3
Maximum daily count	15	20

<sup>a</sup>

Zeillemaker and Trapp (1986).





recorded. Nest locations were delineated on a map and were initially marked with red surveyor's flags and subsequently marked with metal stakes to facilitate subsequent checks to determine fates.

### Terrestrial Transects

Island Transects--We walked along inland transects (2 on Nizki, 3 on Alaid) 2 or 3 times each and recorded all species of passerines seen and/or heard within 126m of the centerline of the transect (Figs. 8 and 9). We used the number of males observed for lapland longspurs to estimate the number of pairs but individuals of other species were used as an index to abundance.

Beach Transects--We surveyed all beach transects (4 on Nizki, 2 on Alaid) at least twice (with the exception of transect 4 on Nizki which was only walked once) recording all passerines seen and or heard (Figs. 8 and 9).

### Establishment of Plots

Common Eider Nesting Plots.--Three common eider plots were delineated, 2 around lake perimeters (within 20m of Mallard and Loon lakes on Nizki), and 1 on Bozo Point which included most of the point. Each area was thoroughly searched and nests found were marked with red surveyor's flags for recheck in August. Contents of nests were recorded.

Glaucous-winged gull Nesting Plot.--A 50m x 139m glaucous-winged gull plot was delineated in a colony on the west end of Nizki. The plot boundaries were marked with metal stakes. Nests

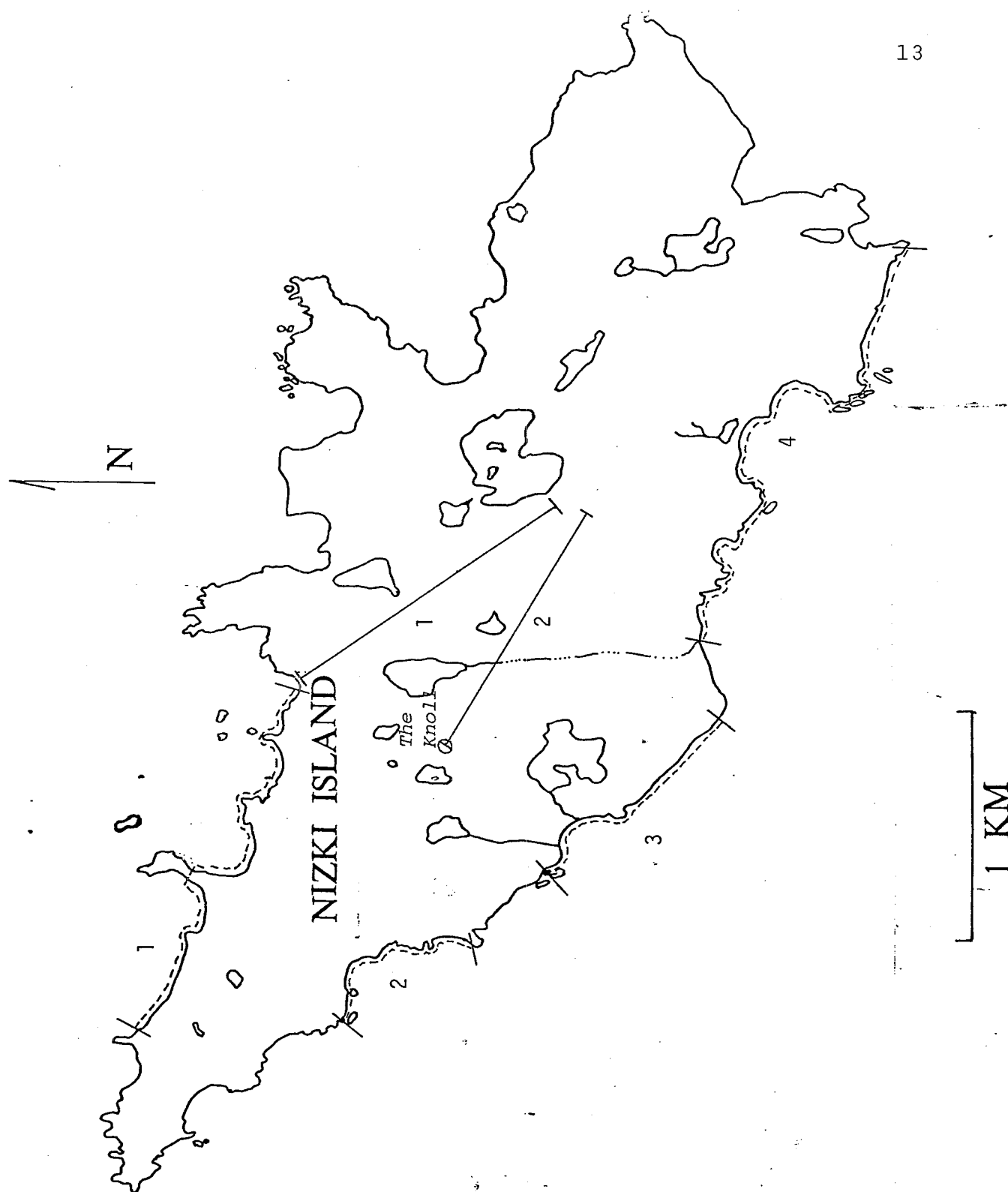


Figure 8. Inland and beach transectson Nizki Island. Beach transect routes are indicated by dashed lines.

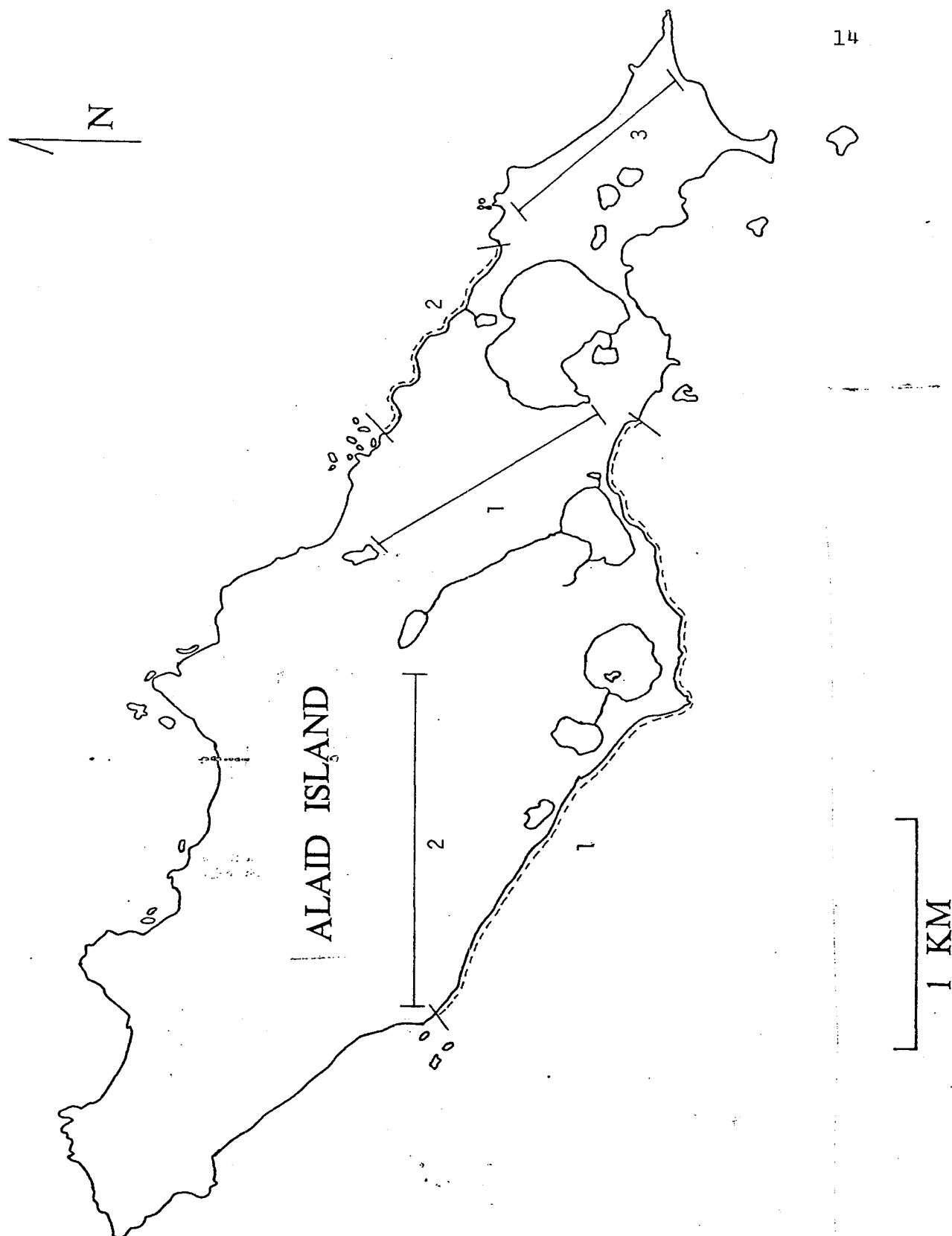


Figure 9. Inland and beach transect routes on Alaid Island. Beach transect routes are indicated by dashed lines.



were marked with red surveyor's flags and contents were recorded. The nests were rechecked in August.

#### Incidental Observations of Birds and Marine Mammals

All incidental observations of birds and marine mammals were recorded. When geese with bands were encountered, an effort was made to read the band numbers. Glaucous-winged gull colonies and common eider nesting areas were delineated on a map, and clutch sizes were recorded.

#### Sea Lion Counts

Sea lions were counted on the four beaches used as haulout sites, from the headlands above and from the Zodiac when the circumnavigation of the island was done (Fig. 10).

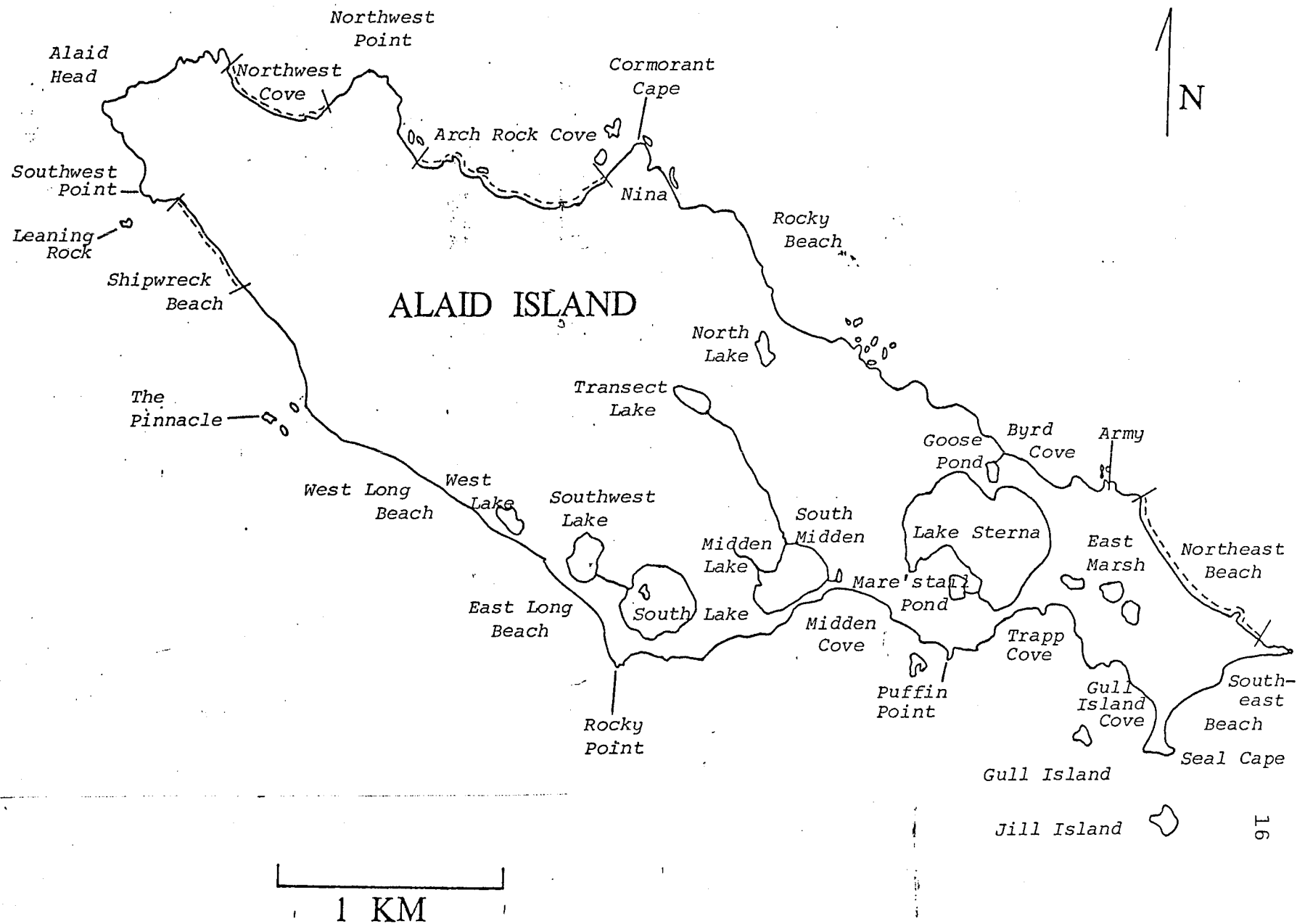
#### Storm-petrel Watch

On June 25 an early morning watch (0100-0230) was conducted from atop the bluff on the south side of West Point, Nizki to detect any storm-petrels in the area. We also listened for storm-petrels at Northwest Cove (0310-0325) and Bozo Cove (0310-0505). Another watch was conducted in Bozo Cove on August 16 (0130-0300).

#### ANNOTATED LIST OF WILDLIFE OBSERVED

Data in the annotated list taken from previous years are from the following sources: 1975--Trapp (1975), 1976--Trapp (1985), 1978--

Figure 10. Steller sea lion haulout sites used in 1990 (haulout sites marked with dashed lines).



Day et al. (1979), 1979--Early et al. (1980), 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986).

### Breeders

Red-throated Loon--In 1990, a total of 28 red-throated loons was seen. The loons were present on 4 out of 11 lakes on Alaid and 12 of 17 lakes on Nizki (Tables 1 and 2). Presence of pairs during this season indicated breeding and one nest was found along the shore of Transect Lake on Alaid on June 5. There was further confirmation of breeding when adults with chicks were observed on 2 lakes on Alaid and 5 lakes on Nizki (Table 3). The population of red-throated loons has increased dramatically (from 6 to 28) and steadily since the removal of foxes in the mid-1970's (Table 4).

Common Loon--A total of 11 was seen in 1990. These loons occupied all 6 of the relatively large lakes on Nizki and Alaid (Tables 1 and 2). In addition, on the shoreline survey, 4 birds were seen around Nizki and 1 around Alaid, and individual birds were seen frequently in several coves around Nizki. In 1984, the population was estimated at 8 birds on 3, possibly 4, lakes. There was a slight increase in number and lake usage from 1984 to 1990. Single chicks accompanied by adults were seen on Lake Sterna, Alaid, and Eider Lake, Nizki in 1990, and a fledged bird was observed in Nizki Cove on August 12. The common loon population appears to have increased only slightly between 1975 and

a

Table 1. Comparison of loon abundance and distribution on lakes and ponds on Nizki Island, 1983-1990.

Lakes	Years								
	1983			1984			1990		
	b			b			b		
	RTLO <sup>c</sup>	COLO <sup>c</sup>	Total	RTLO <sup>c</sup>	COLO <sup>c</sup>	Total	RTLO <sup>c</sup>	COLO <sup>c</sup>	Total
Little West	0	0	0				2	0	2
Big West	2	0	2				2	0	2
Hidden	0	0	0				2	0	2
Knoll	2	0	2				4	0	4
Spar	0	0	0				1	0	1
Loon	0	0	0				0	2	2
Long Valley	0	0	0				0	2	2
Mallard	0	2	2				2	0	2
Kidney	1	0	1				2	0	2
Little Eider	2	0	2				2	0	2
Eider	0	2	2				0	2	2
Jaeger	0	2	2				0	0	0
Stilt	0	0	0				0	0	0
Northeast	0	0	0				2	0	2
Duck	0	0	0				1	0	1
South	0	0	0				1	0	1
High	0	0	0				1	0	1
				d	e				
Total	7	6	13	12	17	29	22	6	28

a  
Data is from the following sources: 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

b  
Breakdown by individual lakes not in report.

c  
RTLO = red-throated loon; COLO = common loon.

d  
Reported on 2 lakes in 1984.

e  
Reported on 3 lakes in 1984.

a

Table 2. Comparison of loon abundance and distribution on lakes on Alaid Island, 1983-1990.

Lakes	Years								
	b								
	1983			1984			1990		
	RTLO	COLO	Total	RTLO	COLO	Total	RTLO	COLO	Total
West	0	0	0				0	0	0
Southwest	0	0	0				1	0	1
South	0	0	0				0	2	2
Midden	0	2	2				0	1	1
South Midden	0	0	0				0	0	0
Mare's Tail	0	0	0				1	0	1
Sterna	0	0	0				0	2	2
East Marsh	0	0	0				2	0	2
Goose	0	0	0				0	0	0
North	0	0	0				0	0	0
Transect	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>2</u>	<u>0</u>	<u>2</u>
Totals	0	2	2	<sup>c</sup> 9	<sup>d</sup> 6	11	6	5	11

a  
Data is from the following sources: 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

b  
Breakdown by individual lakes not in report.

c  
Recorded on 4 lakes.

d  
Recorded on 1 lake.

Table 3. Sightings of loons with young on Nizki-Alaid in 1990.

Species	Island	Date	Location	Number of young
Common Loon				
	Alaid	6-18	Lake Sterna	1
	Nizki	6-23	Lake Sterna	1
		8-06	Eider Lake	1
				a
		8-12	Nizki Cove	1
Red-throated Loon				
	Alaid		b	
		8-05	Transect Lake	2
		8-05	East Marsh	2
		8-14	Transect Lake	1
	Nizki	8-05	Big West Pond	2
		8-06	Hidden Pond	2
		8-07	Knoll Pond	2
		8-10	Little Eider	1
		8-11	Little Eider	1
		8-12	Hidden Pond	2
		8-13	Hidden Pond	2
		8-14	Hidden Pond	2
		8-15	Hidden Pond	2
		8-15	Kidney Pond	1

<sup>a</sup> Fledged.

<sup>b</sup> Nest with 2 eggs seen here on 6-05.

Table 4. Population counts and estimates of breeding birds on Nizki-Alaid, 1975-1990.

	Year												
	1975		1976		1979		1983		1984		1990		
b	c												
Species	Est.	Count	Est.	Count	Est.	Count	Est.	Count	Est.	Count	Est.	Count	
RTLO	6	-	2	-	-	-	7	-	14	-	-	28	
							d						
COLO	8	-	6+	-	-	-	4	-	8	-	-	11	
PECO	-	-	300	-						946	-	1328	
RFCO	3000-5000	-	3000	-	-	-	-	-	-	3410	-	3428	
								e					
CAGO	-	-	-	-	-	-	-	9	-	5	39	35	
GWTE	-	3	6	4	-	-	-	22	-	30	-	14	
MALL	-	11	8	9	-	-	-	23	-	20	-	23	
		f					g					h	
COEI	-	108	700	-	1400	1010	1400	1160	-	2703	1300	1097	
PEFA	2	2	2	2	7	3	-	1	4	3	6	4	
							i						
ROSA	-	17	20	-	-	-	25	-	47	-	40	29	
PAJA	-	4	12	4	-	0	-	5	24	6	32	19	
							j					h	
GWGU	340-400	-	450	-	1430	1450	1450	1427	2652	-	-	3753	
k							l						
BLKI	-	1000-2000	250	-	1511	1252	1511	-	-	442	300	275	
ARTE	-	-	56	-	-	-	-	-	-	-	14	14	
PIGU	-	4	20	-	34	20	34	13	200	93	69	69	
								i					
m													
TUPU	120-1200	-	1400	481	-	-	353	138	-	1210	-	2599	
HOPU	-	46	50-100	-	50	10	50	11	140-150	55	62	62	
CORA	2	2	3	3	5	5	5	3	4	4	8	4	
WIWR	-	-	-	-	-	-	-	-	-	87	-	-	
								i					
SOSP	-	-	-	-	-	-	-	62	-	194	-	-	
LALO	-	-	1100	-	-	-	-	157	2200	265	-	-	
		n											
SNBU	-	22	-	-	-	-	-	35	-	27	-	-	
												o	
ROFI	-	0	6	6	-	-	-	4	-	7	-	3	

a

Data is from the following sources: 1975--Trapp (1975), 1976--Trapp (1985), 1979--Early et al. (1980), 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

b

Species codes and names listed in Appendix .

c

Estimate.

d

Nizki only.

e

In 1982, Klett (1982) reported sighting 14 geese.

f

Only one pair found inland.

g

Includes females and broods.

h

Includes shoreline surveys, partial coastal survey (Alaid), and birds using freshwater lakes.

i

Nizki only.

j

Includes 580 pairs and 290 individuals.

k

Numbers of nests counted are as follows: 1975--80; 1976--100±25; 1979--120; 1984--221; 1990--137.

l

Includes 120 pairs and 1271 individuals.

m

In 1972, the population was estimated at 800 birds (U.S. Fish and Wildlife Service 1973).

n

Includes 19 immature-plumaged birds seen in August.

o

Includes 1 fledgling seen in August.

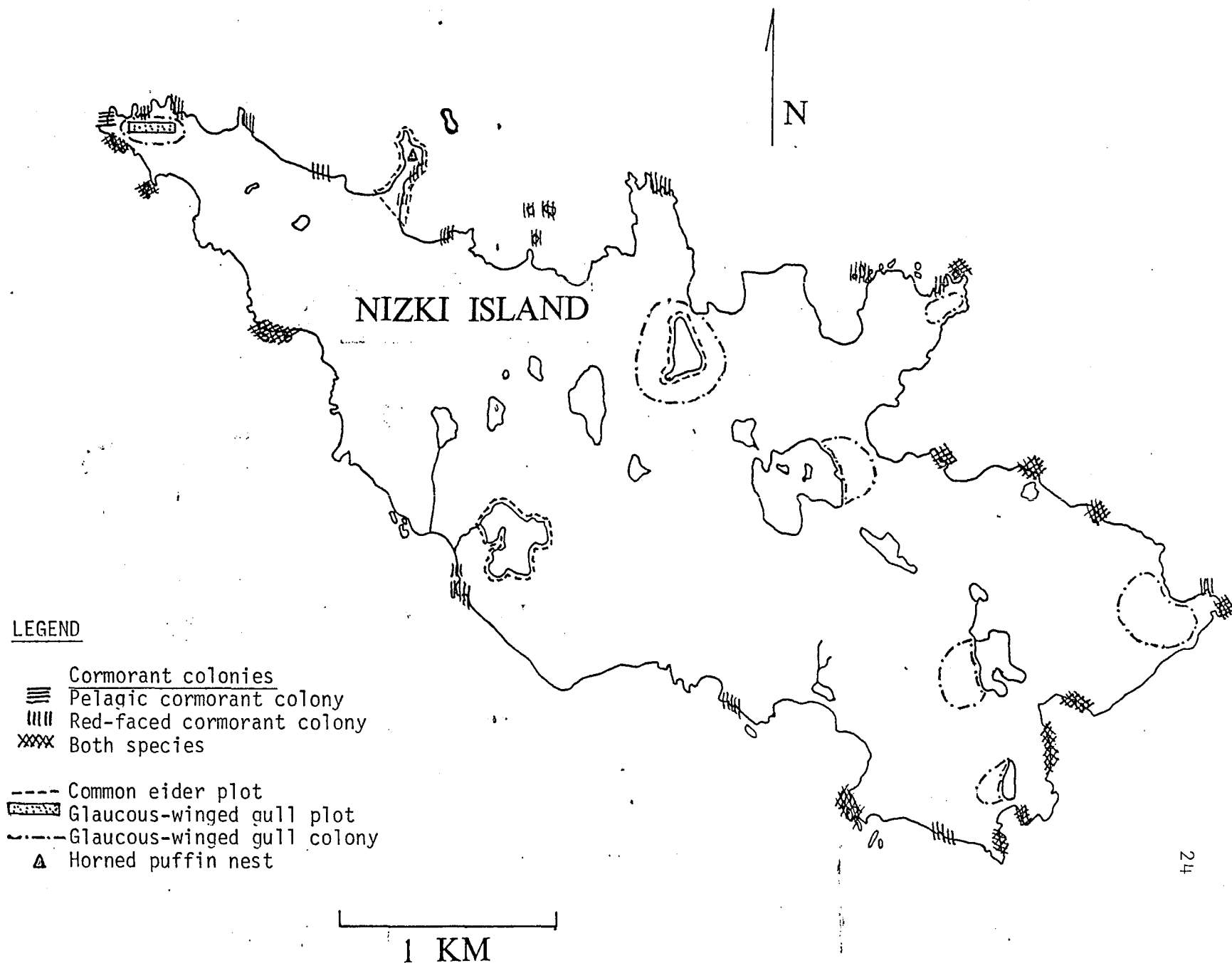


1990, in contrast to the population of its congener, the smaller red-throated loon. Red-throated loons occupy smaller lakes than common loons and may have been more susceptible to fox predation. Every pond on Nizki deep enough for diving except for Jaeger had loons present in 1990 (Table 1), whereas no loons were observed on 4 lakes at Alaid, at least 2 which appeared to be relatively deep (Table 2).

Pelagic and Red-faced Cormorants--We found 30 nesting colonies of cormorants on Nizki (Fig. 11) and 13 nesting colonies at Alaid (Fig. 12) in 1990. About half the colonies on both islands were composed entirely of red-faced cormorants, but Nizki had more mixed species colonies (13 of 30--43%) than Alaid (2 of 13--15%). Only one colony on Nizki was composed entirely of pelagic cormorants, but the percentage on Alaid was higher, 31% (4 of 13).

It was not straight forward to arrive at a population estimate for cormorants, because not all birds could be seen from either the land or the water. Thus we used a combination of shoreline and small boat survey methods to arrive at figures comparable to past surveys (Tables 4, 5, and 6). The estimate for pelagic cormorant assumes the unidentified cormorants were this species. Although some were probably red-faced cormorants, it seems likely that the

Figure 11. Locations of cormorant and gull colonies on Nizki Island.



Glaucous-winged Gull--We observed a total of 3753 gulls on the shoreline surveys, nearshore boat survey for Alaid (where the shoreline survey was not done) and on inland lakes in 1990 (Appendices A - D, Tables 4 and 17). The 1984 and 1990 shoreline survey totals indicate a similar number of birds around the coastlines in both years (Tables 18 and 19), but there was a dramatic increase in the number of gulls using the inland lakes. In 1984, 265 birds were estimated using the freshwater lakes, but in 1990 we counted 1221 gulls on the lake surveys (Table 17). A dramatic increase was also observed in the number of lakes being utilized by gulls. In 1984, they were observed on 13 of 26 lakes and in 1990 they were observed on 25 of 27 lakes. The lake surveys revealed that the immediate lake perimeters of many lakes were being utilized as nest sites (Table 20).

On June 1, when we arrived, many gulls were advanced in incubation, some were pipped, and some had recently hatched. A glaucous-winged gull plot was established on the west end of Nizki (Figure 11). The average clutch size for the 16 nests in the plot was 2.7 (Table 21).

Black-legged Kittiwake--We counted 137 nests and 275 adults at the colony at Cormorant Cape on June 22, approximately half the nests and adults counted in 1984 (Table 4). No chicks were observed and most birds appeared to be incubating. We did not encounter nesting at any other sites. A few birds used Lake Sterna for bathing, as they

Table 17. Glaucous-winged gulls recorded on lake surveys on Nizki-Alaid in 1990.

Island	Lake	Number of birds
Nizki	Little West	42
	Big West	25
	Hidden	3
	Knoll	8
		a
	Spar	15
		b
	Loon	87
	Long Valley	38
	Mallard	60
	Kidney	17
	Little Eider	30
		a
	Eider	101
	Jaeger	24
	Stilt	16
	Northeast	0
	Duck	120
	South	<u>85</u>
	Total	671
Alaid	West	12
	Southwest	42
	South	13
	Midden	32
	South Midden	0
	Mare's Tail	200
		a
	Sterna	109
		a
	East Marsh	61
	Goose	13
	North	60
	Transect	<u>8</u>
	Total	550

a

Includes 1 immature.

b

Includes 2 immatures.

a

Table 18. Comparison of abundance and distribution of  
glaucous-winged gulls observed on shoreline surveys on  
Nizki Island, 1983-1990.

Location	Segments	Year		
		1983	1984	1990
West Point- False Point	(D-D <sub>1</sub> )	21	110	58
Northwest Cove	(D <sub>1</sub> -D <sub>2</sub> )	10	83	119
Bozo Cove- Middle Point	(D <sub>2</sub> -D <sub>3</sub> )	22	105	18
Jones Cove- Jones Point	(D <sub>3</sub> -E)	26	45	110
Mallard Cove	(E-E <sub>1</sub> )	24	50	45
Niz Cove	(E <sub>1</sub> -E <sub>2</sub> )	50	67	78
Pocket Rock- Niz Point	(E <sub>2</sub> -F)	-	70	13
Eider Cove	(F-F <sub>1</sub> )	20	62	20
Arch Beach	(F <sub>1</sub> -F <sub>2</sub> )	-	29	70
Northeast Beach	(F <sub>2</sub> -F <sub>3</sub> )	-	130	160
East Point	(F <sub>3</sub> -A)	-	300	330
Southeast Beach- South Pond Cove	(A-B)	250	123	80
South Point- Loon Cove	(B-C)	281	234	105
Cathedral Rocks- West Point	(C-D)	45	73	81
	Total	749	1481	1287

a

Data is from the following sources: 1983--Zeillemaker (1983),  
1984--Zeillemaker and Trapp (1986), this report.



Table 19. Comparison of abundance and distribution of glaucous-winged gulls observed on shoreline surveys on Alaid Island in 1984 and 1990.

Location	Segments	Year	
		<sup>a</sup> 1984	1990
Northeast Beach- Lookout Point	(A-F)	99	300
Rocky Beach	(F-E)	82	43
West Long Beach- Rocky Point	(B -B)	266	229
Rocky Point- Puffin Point	(B-A )	41	134
Trapp Cove- Gull Island Cove	(A -A )	106	-
	Total	<u>594</u>	<u>706</u>

<sup>a</sup>

Zeillemaker and Trapp (1986).

a

Table 20. Glaucous-winged gull usage of lakes as nest sites on Nizki-Alaid in 1990.

Island	Lake	Number of nests
Nizki	Little West	1
	Big West	1
	Hidden	-
	Knoll	-
	Spar	2
	Loon	12
	Long Valley	6
	Mallard	7
	Kidney	-
	Little Eider	-
	Eider	7
	Jaeger	1
	Stilt	-
	Northeast	-
	Duck	2
	South	-
	Total	39
Alaid	West	2
	Southwest	4
	South	3
	Midden	-
	South Midden	-
	Mare's Tail	7
	Sterna	12
	East Marsh	5
	Goose	-
	North	4
	Transect	1
	Total	38

a

Includes all nests found on sloping banks and on level terrain, 0-5m away from the lake shore.

Table 21. Nesting data on glaucous-winged gulls in the monitoring plot<sup>a</sup> at Nizki in 1990.

Nest Status in June	Number of Nests
1 egg	1
2 eggs	1
3 eggs	9
2 chicks (1 egg)	3
3 chicks	1
<sup>b</sup>	
≥1 chick	<u>1</u>
Total	16

<sup>a</sup>

Rectangular plot 139m x 50m.

<sup>b</sup>

Eggshell fragments indicated hatch had occurred but chick had left the nest.



have done in previous years. The colony was rechecked on August 8 (right after a storm that had lasted for several days). Only 46 nests and 164 birds were counted and evidently many of the nests were destroyed by the wind and/or the waves. None of the remaining nests contained chicks and no fledglings were observed flying around the colony. On August 14, 98 black-legged kittiwakes were observed bathing on Lake Sterna; 16 of these were hatch year birds. On 3 different occasions in June, flocks of 38, 5, and 29 kittiwakes were seen off the north and east coasts of Nizki.

Arctic Tern--This species was observed frequently (15 sightings) on Nizki in 1990, many times in mixed species flocks with Aleutian terns. The 15 sightings totaled 56 birds (3.7 birds/sighting)(2.7 birds/day) and the maximum daily count was 14, which was also the largest number seen at one time. Breeding was confirmed when a juvenile was seen in a flock of 11 birds northwest of Jones Peak. A partial eggshell was also found west of Jones Peak in an area which was defended by a pair of birds. There was previously a colony on one of the islands in Eider Lake and we suspected that there may have been a colony there in 1990. This is the first year since 1976 that this species has been recorded on Nizki-Alaid.

Aleutian Tern--There were 22 sightings of this species in 1990 (1.0 sighting per day) totaling 107 birds (4.9 birds per sighting, 5.1 birds per day) and a maximum daily count of 20 birds, which was also the greatest number of birds seen at one time. Aleutian terns were often seen in mixed-species flocks with arctic terns. The areas of greatest concentration on Nizki appeared to be in the vicinity of Jones Peak and Eider Lake (11 of the 22 sightings), and nesting was suspected in the Eider Lake area. Only 6 birds in one flock were sighted in 1984, and none in 1983 or 1979 but a nest was found in 1976 near Eider Lake.

Pigeon Guillemot--We recorded 58 birds during shoreline surveys, and 69 birds during the nearshore boat surveys (Appendices C and D). These numbers were slightly lower than in 1984 (Table 22), but substantially higher than the mid-1970's (Table 4). Breeding was confirmed in 1990 when an adult was seen carrying food into a rock crevice at Jones Point, Nizki on August 11.

Tufted Puffin--We counted a total of 2190 birds on both islands on the shoreline survey (Appendices A and B) and estimated that there was a total of 3053 burrows on both islands. This represents a dramatic increase in the population of this species since 1984 (Table 22). Detailed information regarding the survey conducted is reported elsewhere (Byrd et al. 1990). It was estimated that there

a

Table 22. Comparison of counts of selected alcid species on shoreline and nearshore boat surveys on Nizki and Alaid islands, 1979-1990.

	b										
	Tufted puffin		Horned Puffin			Common Murre			Pigeon Guillemot		
Shoreline Survey	1984	1990	1983	1984	1990	1983	1984	1990	1983	1984	1990
<u>Alaid</u>			c			c			c		
North side	144	77		20	1		0	31		13	5
South side	<u>111</u>	<u>410</u>	<u>0</u>	<u>13</u>	<u>5</u>	<u>0</u>	<u>1</u>	<u>11</u>	<u>0</u>	<u>25</u>	<u>7</u>
Sub-total	255	487	0	33	6	0	1	42	0	38	12
<u>Nizki</u>											
North side	336	1197	8	19	23	0	6	-	8	21	40
South side	<u>292</u>	<u>506</u>	<u>3</u>	<u>4</u>	<u>3</u>	<u>5+</u>	<u>5</u>	<u>-</u>	<u>5</u>	<u>7</u>	<u>6</u>
Sub-total	628	1703	11	23	26	5+	11	-	13	28	46
Total	883	2190	11	55	32	5	12	42	13	66	58
Nearshore Boat Survey			1979	1984	1990	1979	1984	1990	1979	1984	1990
<u>Alaid</u>											
North side			7	28	32	0	3	53	4	16	16
South side			<u>1</u>	<u>18</u>	<u>15</u>	<u>0</u>	<u>6</u>	<u>54</u>	<u>2</u>	<u>26</u>	<u>20</u>
Sub-total			8	46	47	0	9	107	6	42	36
<u>Nizki</u>											
North side			2	5	3	0	6	109	8	27	23
South side			<u>0</u>	<u>1</u>	<u>12</u>	<u>0</u>	<u>28</u>	<u>32</u>	<u>6</u>	<u>24</u>	<u>10</u>
Sub-total			2	6	15	0	34	141	14	51	33
Total			10	52	62	0	43	248	20	93	69

a  
Data is from the following sources: 1979--Early et al. (1980), 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

b  
Tufted puffins were not counted on boat surveys in 1984.

c  
Survey of north shore of Alaid not done.

were 9 colonies on Nizki and 8 colonies on Alaid (a colony being defined as a group of burrows with a density of  $\geq 0.5$  burrows/m<sup>2</sup>), plus scattered burrows along the steep sea slopes between colonies.

Horned Puffin--We recorded 32 birds during shoreline surveys, and 62 birds during nearshore boat surveys (Appendices A and D). These numbers indicate that the population has remained stable since 1984, after greatly increasing from its earlier level (Table 22). Breeding was confirmed for the first time in 1990 when on June 16, a horned puffin nest in a rock crevice was found on Bozo Point. It contained an egg and an adult. On August 4, 2 adults and a chick were observed in the crevice and on August 15, the last time it was rechecked, there was 1 adult and 1 chick in the crevice.

Common Raven--Common ravens were recorded on 9 of 21 days (43%) afield in 1990, compared with 54% of the days afield in 1984. They were observed on both islands, but most frequently on Nizki. We had 12 sightings (0.6 sightings/day) totaling 20 birds (1.7 birds/sighting, 1.0 bird/day) and a maximum daily count of 4 birds, which was also the greatest number seen at one time. Comparisons with sightings in 1984 indicate that the population has remained stable since that time. Breeding was confirmed in late June and August when juveniles were seen with adults.

Winter Wren--This species occupies a very restricted ecological niche, being found only along boulder and cobble beaches in the vicinity of cliffs. The number of winter wrens recorded on the shoreline surveys this year does not accurately reflect the total population of this species, since much of the shoreline was traversed along headlands instead of on the beach where the birds would be conspicuous. Beach transects provide an index to populations, and the results suggest no obvious trends since fox removal (Table 23).

Song Sparrow--Song sparrows were encountered most frequently along beaches of boulders and rocks and in cliff areas. Like winter wrens, song sparrow numbers on transects show no clear trends since fox removal (Table 23). Breeding was confirmed for this species on June 3 when an adult was observed feeding insects to a fledgling at Northwest Cove, Nizki.

Lapland Longspur--This was the most widely distributed passerine on the islands. Birds were abundant in Calamagrostis meadows as well as Empetrum-Cladonia tundra to an elevation of at least 60m. Inland transects on Nizki and Alaid were run at least twice and some of them were run three times (Table 24). The only comparable data for Nizki is from the years 1975 and 1978, when each transects was run once (Table 24). The number of males detected within 15m,

a                      b

Table 23. Comparison of abundance of passerines along beach transects on Nizki and Alaid islands, 1978-1990.

	1978			1979			1983			1984			1990		
	WIWR	SOSP	SNBU	WIWR	SOSP	SNBU	WIWR	SOSP	SNBU	WIWR	SOSP	SNBU	WIWR	SOSP	SNBU
<u>Nizki</u>															
						e									
Transect 1	21	42	21	6	30	27	11	14	2	19	30	2	10	46	1
Transect 2	9	22	9	3	4	7							7	10	1
Transect 3	3	12	4	1	4	11	f	f	f	f	f	f	2	13	5
Transect 4	9	38	12										g	g	g
													2	36	5
<u>Alaid</u>															
Transect 1	4	58	16	0	3	6	0	0	0	8	17	0	0	10	0
Transect 2	6	12	7	3	15	22							5	22	1

a

Data is from the following sources: 1978--Day et al. (1979), 1979--Early et al. (1980), 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

b

WIWR = winter wren; SOSP = song sparrow; SNBU = snow bunting.

c

Figures taken from segments of shoreline survey corresponding to beach transect (Transect 1 = Segments E-D, Transects 3 and 4 = Segments B-C).

d

Figures are averages.

e

Numbers include females and immatures.

f

Total for Transect 3 and 4.

g

Transect 4 only done once.

Table 24. Population Indices<sup>a</sup> of Lapland Longspur at Alaid-Nizki islands, 1975-1990.

Island	Transect	Distance <sup>b</sup>	Year					
			1975	1976	1978	1979	1984	1990
<u>Alaid</u>	1	15m	2.5 <sup>c</sup>	3	10	2	7	5.5
		>15m <sup>d</sup>	<u>7.5</u>	<u>4</u>	<u>16.5</u>	<u>16</u>	<u>17</u>	<u>8.5</u>
			10	7	26.5	18	24	14
	2	15m	3	1	10	5	9	8
		>15m	<u>11</u>	<u>5</u>	<u>16</u>	<u>14</u>	<u>20</u>	<u>15</u>
			14	6	26	19	29	23
	3	15m	6	3.5	6	8	13	7.5
		>15m	<u>12</u>	<u>6</u>	<u>11</u>	<u>19</u>	<u>27</u>	<u>1</u>
			18	9.5	17	27	40	8.5
	Totals		42	22.5	69.5	64	93	45.5
 <u>Nizki</u>								
	1	15m	6		13			3.7
		>15m	<u>6+</u>		<u>5</u>			<u>4.5</u>
					18			8.2
	2	15m	1		9			9
		>15m	<u>1</u>		<u>8</u>			<u>4.5</u>
					17			13.5
	Totals		7+		35			21.7

<sup>a</sup> Data is from the following sources: 1975--Trapp (1975), 1976--Trapp (1985), 1978--Day et al. (1979), 1979--Early et al. (1980), 1984--Zeillemaker and Trapp (1986), this report.

<sup>b</sup> Transect lengths in m: Transect 1 = 1,079; transect 2 = 1,481; transect 3 = 917.

<sup>c</sup> Average number seen per replicate

<sup>d</sup> 16-126m



the critical detection distance, and the number seen out to 126m, the maximum transect width, did not reveal a trend since foxes were removed (Table 24). Nevertheless there were substantial differences among years suggesting natural fluctuations. On June 15 when 2 nests containing 5 eggs each were discovered along the south shore of Nizki, in Calamagrostis meadow habitat. Subsequently, a nest with 6 eggs was found beside Little West Pond on Nizki and a nest with 4 eggs was found along inland transect 2 on Alaid.

Snow Bunting--This species was most frequently encountered along the rocky shoreline. Its presence was detected in very low numbers on 5 of 6 beach transects run in 1990 (Table 23). The abundance of snow buntings relative to other small passerines along the coastal fringe has steadily declined. In 1975-1979 it was 25%, in 1983-1984 it was 13%, and in 1990 it was 7.4%. A nest containing 4 eggs was located high up in a crevice along the beach cliffs at Barrier Pt.

Rosy Finch--There were only 2 sightings (both on Nizki) of this species in 1990. It occupies boulder and cobble beaches in the vicinity of cliffs. A male was seen at Bozo Point in June, and in August an adult male and a juvenile were seen at Northwest Cove, demonstrating breeding of this species at Nizki-Alaid.



Steller Sea Lion--We counted an average of 495 animals at 5 haulout sites on Alaid (Figure 10)(Table 25). Our count was lower than any previous estimate (Table 25), and it appears that the precipitous decline that was observed between 1978 and 1984 has continued. High daily variation in numbers of animals hauled out on the beaches, was recorded (Table 26). Three pups were seen at Arch Rock Cove on June 22 and 7 pups were observed there (both from the water) on August 8, the only breeding on the islands.

Harbor Seal--We counted a total of 156 animals in 25 sightings (20 at Nizki) in 12 days. The largest number seen at one time at Nizki was 22 on June 18 in Middle Cove. All the other sightings at Nizki were of 10 or fewer animals. The largest number seen in 1 day at Nizki was 26 (in 5 groups) along the south shore between South Beach and Cathedral Rocks. The largest group of animals at Alaid was 35, seen around Gull Island on August 5. There was 2 sightings of a pup at Middle Cove, Nizki, on June 17 in a group of 4 animals and on June 18 in a group of 22 animals. One pup was sighted at Alaid, in a group of 3 at Gull Island Cove.

Sea Otter--We observed a total of 34 animals on 7 days in June and 2 days in August. Six of the 122 sightings were of single animals. The highest number of adults observed at one time was 6, seen east of Cathedral Rocks off the south

Table 25. Comparison of counts of Steller sea lions at Alaid Island, 1959-1990.<sup>a</sup>

Site	Number of Animals Recorded								
	1959	1965	1975	1976	1978	1979	1983	1984	1990
Spit	--	--	0	0	0	550	0	4	29
Northeast Beach	--	--	150- 250	170	800	0	245	68	93
Cormorant Cape East	--	--	450	--	500	0	--	0	0
Cormorant Cape West	--	--	1200-1500	--	1300	0	--	370	339
Norhtwest Cove	--	--	1500-1700	1000	1900	725	--	630	9
Shipwreck Beach	<u>--</u>	<u>--</u>	<u>1200-1500</u>	<u>350</u>	<u>220</u>	<u>1200</u>	<u>--</u>	<u>30</u>	<u>25</u>
Totals	1500	2500	4500-5400	1520+	4720	2475	245+	1102	495

<sup>a</sup>

Data is from the following sources: 1959--Kenyon and Rice (1961), 1965--Kenyon and King (1965), 1975--Trapp (1975), 1976--Trapp (1985), 1978--Lawhead (1979), 1979--U.S. Fish & Wildlife Service (1980), 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report. Plus sign (+) indicates incomplete count. 1959 and 1965 counts are based on aerial surveys: all others are boat or shore-based.

Table 26. Variations in counts of Steller sea lions at haulout sites on Alaid Island in 1990.

Site	Date	Time	Number
Spit	6-23	1030	4
	6-23	1800	2
	8-04	1230	82
Northeast Beach	6-05	1130	20
	6-07	1500	30
	6-16	1830	25
	6-18	1000	24
	6-19	1130	32
	6-23	1030	42
	6-23	1800	33
	8-04	1230	122
	8-05	1100	225
	8-14	1030	378
Arch Rock Cove	6-22	1430	353 <sup>a</sup>
	8-08	1100	325 <sup>b</sup>
Northwest Cove	6-22	1500	9
Shipwreck Beach	6-18	1530	29
	6-20	1830	19
	6-22	1530	29
	6-23	1415	23
$\bar{x}$			90.3
s			123.8

<sup>a</sup>  
Includes 3 pups.

<sup>b</sup>  
Includes 7 pups.

shore of Nizki. Most sightings (10 of 12) were at Nizki, and equal number on the north and south sides of the island (this was undoubtedly due in part to the fact that most of our days afield were at Nizki). The 2 sightings at Alaid (of 3 and 7 individuals) were both on the south side. A total of 5 pups was observed, 1 with an adult south of Loon Lake, Nizki, on June 13, 2 with 5 adults at Long Beach, Alaid, on August 5, and 2 with 4 adults in the cove east of Eider Cove, Nizki. Until 1990, there were no recent records of sea otters at Nizki. In 1984, 3 animals were observed at Alaid. This species is apparently increasing in numbers around both islands.

#### Non-Breeders

Sooty Shearwater--A dead bird was found on the beach in Bozo Cove, Nizki, on June 1. A pair of wings was found on June 16 at West Cove, Nizki.

Short-tailed Shearwater--One was seen flying off the south coast of Nizki on June 16 during a period of strong southwest winds. "Hundreds" of this species were observed off on August 3 south of Barrier Point during a southwest gale, and "thousands" were observed along this same stretch



of coastline on August 10, again in gale conditions). A carcass was found on June 20 on the spit and another was found on August 10 at East Breaker Beach, Nizki.

Storm-Petrels--On June 25, three sites on Nizki were monitored during the night for a total of 3 hours, for storm-petrels. At the first 2 sites (West Point and Northwest Cove) nothing was heard or seen, but at Bozo Cove, between 0355 and 0505 hours, 10 separate calls of Leach's storm-petrel were heard. It was thought that this might be 1 bird at or near its burrow. Leach's storm-petrels were heard in Bozo Cove on at least 2 separate occasions. On August 16, a 90-minute watch was conducted in Bozo Cove, producing a total of 6 vocal encounters with Leach's storm-petrels and 2 with fork-tailed storm-petrels. This is the first record of vocal encounters with the latter species at Nizki-Alaid. One was observed on Alaid in July 1979, and a wing of one was found on Alaid in 1975. Two fork-tailed storm-petrel carcasses (wings and tail intact) were found on Nizki during June, which appeared to be peregrine falcon kills. An intact bird in very good condition with a broken wing was found on Alaid, along the beach between Midden Cove and Rocky Point. The intact wings of a Leach's storm-petrel were found in Mallard Cove, which also appeared to be a peregrine falcon kill.

Storm-petrels were detected by their distinctive odor on the very western end of Nizki, just south of the spit, but we found no burrows here or elsewhere.

In 1984, both visual and vocal contact was made with Leach's storm-petrels, and their continued presence suggests that a small breeding population may have become established. They apparently occur in greater numbers than our observations might indicate, particularly since they are turning up regularly in the peregrine falcon diet.

Emperor Goose--A single adult was seen in the water at Bozo Cove, Nizki, on June 22. There have been two other sightings of single birds at Nizki, in 1976 and 1983. A carcass was found on June 16 on the headland at West Cove. Another was found on June 26 at the east end of Bozo Cove. It was well infiltrated by maggots and was perhaps a winter bird.

Northern Pintail--Two pintails were seen on Nizki in 1990 (Table 27), fewer than previous years.

Northern Shoveler--A total of 6 birds was seen in 1990 on Nizki-Alaid (Table 27). This species had not been recorded at Nizki-Alaid prior to 1990.

a

Table 27. Usage of lakes and ponds by non-breeding waterfowl on Nizki and Alaid islands in 1990.

Lake or Pond	b								
	Species					c			
	NOPI	EUWI	NOSH	TUDU	GRSC	COPO	COGO	RBME	SMEW
<b>Nizki</b>									
Little West	1		1						
Loon				2				2	
Long Valley				2					
Mallard				3			1		1
Duck	1			7				2	
<b>Alaid</b>									
Mare's Tail					4			2	
		d							
Sterna		2						13	
East Marsh	1		5	2	1	1			
Goose								2	
Totals	3	2	4	16	5	1	1	21	1

a  
NOPI = northern pintail; EUWI = Eurasian wigeon; NOSH = northern shoveler;  
TUDU = tufted duck; GRSC = greater scaup; COPO = common pochard; COGO = common goldeneye; RBME = red-breasted merganser; SMEW = smew.

b  
Highest numbers seen. Species codes and species names listed in Appendix .

c  
Four females and 1 male also seen at East Point, Nizki on 6/15.

d  
A pair.

Eurasian Wigeon--The single sighting of this species was a pair seen on Sterna Lake in June (Table 27). Small numbers of this species have been seen on Nizki-Alaid since 1976.

Common Pochard--A single individual was observed on East Marsh, Alaid, on June 5 (Table 27). This is the first record of a male of this species being sighted at Nizki-Alaid.

Tufted Duck--A total of 16 birds was seen in 1990, all but 2 of them on Nizki (Table 27). The sighting of 14 birds in 1983 and a pair in 1982 (Klett and Dragoo, pers. comm.) were all on Nizki.

Greater scaup--This species was observed on Mare's Tail Pond and East Marsh at Alaid in 1990 (Table 27). It appears fewer birds were detected in 1990 than in previous years.

Harlequin Duck--We recorded 93 harlequins around Nizki and none around Alaid on the shoreline surveys. The nearshore boat surveys yielded 53 around Nizki and 1 seen off Alaid. Many more were recorded on the surveys conducted in 1983 and 1984, but these were done earlier in the spring than in 1990 and the numbers probably included many wintering birds that had not migrated out of the area yet. Later surveys reflect the summer population. Since this species occurs in the



intertidal zone and does not come ashore to breed on the islands, its population levels probably would not have been affected by the removal of the arctic fox.

White-winged Scoter--A flock of 12 first-winter males was seen on the water in Northwest Cove, Nizki, on August 7. Another flock of 8 was seen in the same location on the 11th. This is the first August record for the islands of this species.

Common Goldeneye--One was seen on Mallard Lake, Nizki, on June 4 for the only 1990 sighting (Table 27). Small numbers of this species have been observed regularly since 1975.

Red-breasted Merganser--A total of 21 birds was seen on Nizki-Alaid this year (Table 27), the first of this species observed here since 1976.

Smew--A first year male was seen on Mallard Pond, Nizki, on June 4 and 6, for the first record of this species at Nizki-Alaid.

Gray-tailed Tattler--This species was heard on August 5 and seen on August 8 in Bozo Cove, and was seen on August 6 at Eider Cove, Nizki. These were the first records of this species for the islands in August, although the species has been seen regularly in small numbers in previous years.

Red-necked Phalarope--A single individual was seen at East Marsh, Alaid, on August 14. This is the first sighting of this species in recent years.

Snipe species--An unidentified snipe was flushed from the northwest corner of East Marsh, Alaid, on June 3 and was tentatively identified by voice as a pintail snipe.

Temminck's Stint--One bird was flushed from the marshy area on the northwest side of East Marsh and was identified by voice. This is the first record of this species at Nizki-Alaid.

Terek Sandpiper--A single individual was seen from August 11-17 in Eider Cove on Nizki. The only other sighting of this species on Nizki-Alaid was in the spring of 1983, although it was observed on Shemya in 1976 and 1983.

Long-tailed Jaeger--There was a single sighting of this species on August 7 on Nizki. The bird was seen flying west of Jones Peak and Eider Lake, in the same area as 18 parasitic jaegers which were giving chase. The only other sighting of this species at Nizki-Alaid was in the spring of 1983 although it has been recorded at Shemya in previous years.

Slaty-backed Gull--There were 4 sightings of this species at Nizki in 1990. A third-year bird west of Jaeger Pond flying south on June 13 and 2 adults were seen at South East Beach with a flock of 75-100 soaring glaucous-winged gulls. One was perched near the water; the second remained in flight most of the time. A single adult was seen on August 6 at South East Beach. On August 10, a third-year bird was seen flying south near Mallard Pond. In 1983, a pair was observed during the breeding season in a colony of glaucous-winged gulls on Nizki but breeding was never confirmed. On June 18 a third-year bird was seen at the spit connecting Nizki and Alaid.

Common Murre--We recorded 141 birds at Nizki and 107 birds at Alaid, for a total of 248 birds during the nearshore boat surveys (Appendices C and D). A much lower number was recorded during the shoreline surveys in 1990, as was the case in 1984 (Table 22). The population has increased steadily since 1979 and approximately six-fold since 1984 (Table 4), although no signs of nesting were observed in 1990. However, adults accompanying 3 fledglings were sighted on August 18 in Bozo Cove.

Thick-billed Murre--A single individual was seen in Mallard Cove, Nizki, on August 13, when it swam ashore and sat quietly on the beach for at least 30 minutes. During that time, it reentered the water once when a common raven flew

overhead, vocalizing. The only other sighting of live birds of this species at Nizki-Alaid occurred in 1976. Two carcasses were found at Nizki on June 9, 1 just east of False Point and 1 in Middle Cove.

Ancient Murrelet--We observed 2 birds in flight off the east end of Nizki while conducting the nearshore boat survey for the only sighting of this species in 1990. At least 20 birds were seen in 1983 and a total of 109 individuals in 9 sightings in 1984, both years in which surveys were conducted earlier in the season.

Rough-legged Hawk--We observed an immature flying east over the west end of Nizki on June 2, being harassed by glaucous-winged gulls. There has been one other single sighting of this species in recent years (1976).

Short-eared Owl--A single bird was seen flying south of Mallard Pond, Nizki, on June 4 for the only sighting of this species in 1990. This species was seen on Alaid in 1976 and 1984, but this is the first known sighting for Nizki.

Eye-browed Thrush--A single individual was observed in Bozo Cove, Nizki, on June 1. This species has been seen in 2 previous years (1976 and 1983).



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Appendix A. Shoreline survey for Nizki Island, Alaska, 1990.

	Segments															
Species <sup>a</sup>	A-B	B-C	C-D	D-D1	D1-D2	D2-D3	D3-E	E-E1	E1-E2	E2-F	F-F1	F1-F2	F2-F3	F3-A	Totals	
<sup>b</sup>																
RTLO		2										1			3	
COLO		3									1				4	
PECO																
birds	151	66	141				2		8	38	11	186	1	24	628	
nests	83	13	44						2	13	2	74		1	232	
RFCO																
birds	400	46	319	119	109	81	281	60	312	305	20	150	130	50	2382	
nests	113	30	129	32	72	38	71	3	146	97	2	20	30	13	796	
UNCO																
birds	132		145											40	317	
nests			7												7	
CAGO															0	
GWTE															0	
MALL		1m						2							3	
COEI																
male	49	105	29	21	20	6	30	70	28	10	48	78	33	27	554	
female	29	40	17	14	9	1	9	9	6	1	19	19	12	3	188	
PEFA					1		2								3	
ROSA									2		1				3	
PAJA			2				1								3	
GWGU	80	105	81	58	119	18	110	45	78	13	20	70	160	330	1287	
BLKI	8														8	
PIGU		5	1	3	10		1	6	3	7	6	4			46	
ANMU															0	
TUPU	329	49	128	607	98	7	427	58							1703	
HOPU	1		2	3	7		3		4	1	2	3			26	
COMU	3	21	114	3	11		2	2	3					1	160	
CORA	4		2			2						4			12	
WIWR			2	3	5	2	5	3	1						21	
SOSP			1	7	16	8	9	4	7		5	7	2		66	
LALO									4		1				5	
SNBU				1	1		1	5	2				1		11	
ROFI						1									1	
SEOT			4	1									1		6	
HASE	8	15	1		2								1		27	
HADU	37		11		3		1	3	13		20	3		2	93	

<sup>a</sup> Species sighted on Nizki-Alaid in  $\geq 1$  year are listed.

<sup>b</sup> Species abbreviations explained in Appendix .

Appendix B. Shoreline Survey for Alaid Island, Alaska, 1990.

Species <sup>a</sup>	Segment												Totals
	A-A1	A1-A2	A2-B	B-B1	B1-B2	B2-C	C-D1	D1-D	D-E	E-F	F-F1	F1-A	
RTLO <sup>b</sup>													
COLO				1									1
UNCO <sup>c</sup>													
birds			173							26			199
nests			5							10			15
PECO													
birds		44	70			6				28	22	2	172
nests		10	57			7				23	16		113
RFCO													
birds	65	234	5		19	10		110		247	42	88	820
nests	1	69	2			1		85		133		20	311
CAGO					2								2
RBME		4											4
GWTE													0
MALL													0
COEI													
male	15	25	27	1	16	26				52	13		175
female	3	6	26	1	9	5				9	8		62
PEFA													0
ROSA			11										11
PAJA										1			1
GWGU	160		134	105	24	260				43	116	184	1152
imm.				100							26		
BLKI	3				1								4
PIGU		5		1	1					5			12
ANMU													
COMU	7			4						18	13		42
TUPU		384	22	4						62	15		487
HOPU		1								1	4		6
CORA											1		1
SOSP										1			1
WIWR													
LALO													
SNBU													
ROFI													
SEOT													
adults			8										8
pups			1										1
HASE													
adults	4		32		5					3			44
pups	1		8										9
STSL	3		2			19						41	65

a

Species that have been sighted on Nizki-Alaid in  $\geq 1$  year are listed.

b

Species abbreviations explained in Appendix .

c

Unidentified cormorant species.



Appendix C. Nearshore Boat Survey of Nizki Island, Alaska, 1990.

Segment															Totals
Species	A-B	B-C	C-D	D-D <sub>1</sub>	D <sub>1</sub> -D <sub>2</sub>	D <sub>2</sub> -D <sub>3</sub>	D <sub>3</sub> -E	E-E <sub>1</sub>	E <sub>1</sub> -E <sub>2</sub>	E <sub>2</sub> -F	F-F <sub>1</sub>	F <sub>1</sub> -F <sub>2</sub>	F <sub>2</sub> -F <sub>3</sub>	F <sub>3</sub> -A	
COLO <sup>b</sup>									1						1
RTLO															0
MALL															0
GWTE															0
NOPI															0
COEI <sup>c</sup>															
Male															
Female															
Ducklings															
HADU		9	2	3		22		2				10	5		53
PEFA															0
CORA															0
PECO <sup>d</sup>															
RFCO <sup>d</sup>															
UNCO <sup>d</sup>															
Birds	7	45	83	25	7			10	20					25	222
Nests	4		29	26	8			11	2					12	92
GWGU															
Adult															
Imm.															
BLKI															0
ARTE		1							3						4
ALTE		3													3
COMU		26	6	20	15	13	7	14		10		2	18	10	141
PIGU	1	3	6			8	2	3		5		2	2	1	33
ANMU														2	2
PAAU															0
HOPU		8	4	1			1	1							15
TUPU	40	46	80	55	51		8	85	26		15	15	18	15	454
SEOT		2	9												11
HASE				1											1
STSL															
Ad. bull	2			2											4
Young bull/cow															

a

Species sighted on Nizki-Alaid in  $\geq 1$  year are listed.

b

Species abbreviations explained in Appendix .

c

Common eiders not counted on this survey.

d

Only cormorants and nest not visible from shore were counted.

## Appendix D. Nearshore Boat Survey of Alaid Island, Alaska, 1990.

Species <sup>a</sup>	Segment												Totals
	A-F1	F1-F	F-E	E-D	D-D1	D1-C	C-B2	B2-B1	B1-B	B-A2	A2-A1	A1-A	
COLO <sup>b</sup>													0
RTLO													0
MALL													0
GWTE													0
NOPI													0
COEI													
Male			40	14	8	14	22	14	7				119
Female			4		4	2	4	3					17
Ducklings													0
HADU					1								1
PEFA													
CORA				2									2
PECO						12							12
RFCO													
birds				164	52	30	55						301
nests				88		25							113
UNCO <sup>c</sup>													
birds			101	24		67	233						425
nests			70			9	57						136
GWGU													
Adult			25	5	50	10	29		82				201
Imm.			3		7				19				29
BLKI													
birds				275									275
nests				137									137
ARTE													0
ALTE													0
COMU			25	25		3	33	7	14				107
PIGU			2		11	3	9	2	9				36
ANMU													0
PAAU													0
HOPU				3	14	15	15						47
TUPU		23	50	34	50	255	70				357		839
SEOT													0
HASE													0
STSL													
Ad. bull				250 <sup>d</sup>	9		29 <sup>e</sup>						259
Young bull/cow				100									100
Pups				3									3
SNBU				1									1
ROFI					1								1

a

Species that have been sighted on Nizki-Alaid in  $\geq 1$  year are listed.

b

Species abbreviations explained in Appendix .

c

Unidentified cormorant species.

d

Estimate

e

This is a total for animals seen; number of cows/young bulls not estimated.

Appendix E. List of species abbreviations used in report.

RTLO - Red-throated loon  
COLO - Common loon  
PECO - Pelagic cormorant  
RFCO - Red-faced cormorant  
UNCO - Unidentified cormorant species  
CAGO - Canada goose  
GWTE - Green-winged teal  
MALL - Mallard  
NOPI - Northern pintail  
EUWI - Eurasian wigeon  
NOSH - Northern shoveler  
TUDU - Tufted duck  
GRSC - Greater scaup  
COPO - Common pochard  
COGO - Common goldeneye  
RBME - Red-breasted merganser  
SMEW - Smew  
COEI - Common eider  
PEFA - Peregrine falcon  
ROSA - Rock sandpiper  
PAJA - Parasitic jaeger  
GWGU - Glaucous-winged gull  
BLKI - Black-legged Kittiwake  
PIGU - Pigeon guillemot  
TUPU - Tufted puffin  
HOPU - Horned puffin  
COMU - Common murre  
CORA - Common raven  
WIWR - Winter wren  
SOSP - Song sparrow  
LALO - Lapland longspur  
SNBU - Snow bunting  
ROFI - Rosy finch  
SEOT - Sea otter  
HASE - Harbor seal  
STSL - Steller sea lion

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