QUARTERLY REPORT

Contract #03-5-022-69

Research Unit #3/4

Reporting Period April 1, 1976-

June 30, 1976

Pages

Identification, Documentation and Delineation of Coastal Migratory Bird habitat in Alaska.

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I. Task Objectives

1. Summarize and evaluate existing literature and unpublished data on the distribution, abundance, behavior, and food dependencies of birds associated with littoral and estuarine habitat in the Gulf of Alaska, Bristol Bay, Beaufort Sea and Chukchi Sea, and on barrier islands in the Beaufort Sea.

2. Determine seasonal density distribution, critical habitats, migratory routes, and breeding locales for principal bird species in littoral and estuarine habitat in the Gulf of Alaska, Bristol Bay, Beaufort Sea and Chukchi Sea; and on barrier islands in the Beaufort Sea. Identify critical species particularly in regard to possible effects of oil and gas development.

3. Describe dynamics and trophic relationships of selected species at coastal study sites on the Beaufort Sea.

III. Field Activities

The report of activities in the Beaufort and Chukchi Seas will be completed by George Divoky, Alaska Department of Fish and Game, Fairbanks.

A. Schedule

1. Not reported in the April 1, 1976 Quarterly Report was the completion of the survey in the Kodiak Archipelago. On March 22-24 a State of Alaska chartered Grumman Goose was utilized to complete the survey of Kodiak Afognak, and Shuyak Islands.

2. On April 1, 1976 the Office of Aircraft Services "Super" Goose, the "Aleutian Goose" was used in pelagic surveys in the Kamishak Bay and outer Kachemak Bay regions of Lower Cook Inlet.

3. From April 30 to May 8 a Chitina Air Service Cessna 185 and Gulf Air Service Cessna 180 were used for bird surveys from Cordova to Cape Fairweather.

4. Surveys from the Kvichak River to Cape Newenham in Bristol Bay were completed May 17-20 using a Cessna 185 of Charlie Allen's Flying Service.

5. Partial habitat mapping and bird observations were made on the south side of the Alaska Peninsula from June 14-16 using a Peninsula Airways Grumman Widgeon.

B. Scientific Party

1. Three secondary observers were used for the three day survey of Afognak-Shuyak Islands. William Donaldson, Alaska Department of Fish and Game, Kodiak, Alaska; Richard MacIntosh, National Marine Fisheries Service, Kodiak; Vernon Berns, U. S. Fish and Wildlife Service, Kodiak National Wildlife Refuge, Kodiak.

2. For the lower Cook Inlet survey, David Erikson, Alaska Department of Fish and Game, Homer was the secondary observer.

3. On April 30, M. E. (Pete) Isleib, on contract to U. S. Fish and Wildlife Service, was the second observer for surveys of the Copper River Delta. From May 1 to the present David Kurhajec, Alaska Department of Fish and Game technician has been the second observer for all surveys (3-5 above). In all but the June 14-16 survey Paul Arneson, Alaska Department of Fish and Game, Anchorage has been one of the two observers used per flight.

C. Methods

As described in the April 1, 1976 Annual Report with Quarterly summary, a stratified random sampling scheme was used for bird

surveys in the Kodiak Archipelago. The entire Archipelago was stratified into eight habitat types and count units within each type were marked off using identifiable geographic features to mark the starting and ending points of each unit. These count units were then numbered and totaled. The habitat types and total numbers of units were:

Strata Code	Stratum	Number of Sample Units
A	Outside Waters - Forested	20
B	Inside Waters - Forested	44
C	Heads of Bays - Forested	4
D	Outside Waters - Rock/tundra/alder	46
E	Inside Waters - Tundra/alder	86
F	Mudflats Heads Bays - Tundra/alder	20
G	Estuaries/lagoons	30
H	Low Tundra/mud-sand Beach	17

With the help of Dr. Samuel J. Harbo, Jr., University of Alaska biometrician, relative bird densities for each strata were decided upon and the minimum number of units to be sampled was finalized:

Stratum	Density Rating	Strata	Number Sampled
A	1	A	4
D	1	B	12
H	2	C	4 (all units)
B	8	D	6
E	8	E	24
F	8	F	6
G	8	G	8
All "C" units to be censused.		Total	68

It was felt that weather, time and money would not allow a complete census of the islands so this stratified-random sampling design was used. Units to be sampled were selected using a table of random numbers. Open water portions needed to be surveyed so an amphibious aircraft was used and an attempt was made to count all birds within the count unit.

Techniques used in other areas varied with the type of habitat being surveyed. Amphibious aircraft were used in rocky coastal areas and single-engine aircraft on wheels along sandy coastline. Aircraft speed varied from 80 to 120 knots but an altitude of 100 ft. (30m) was maintained as much as possible.

Observers were used on both sides of the aircraft. While surveying long, straight beaches the aircraft flew slightly seaward of the waterline and the shoreside observer enumerated

all birds visible to the beach ridge. The oceanside observer recorded all birds within 1/8 mile (200m) of the aircraft and noted concentrations outside of this zone. In extensive estuaries where total counts were not possible, transects were flown at equidistant intervals and birds were recorded by both observers within 1/8 mile of the aircraft. Upland vegetation inundated by storm tides was also surveyed.

All observations were recorded on cassette-type tape recorders. Information recorded was: bird identification to lowest taxa possible (order, family, genus, species); bird numbers, habitat type in which the bird was found and other information including activities, sex, color phase, etc., as outlined in the data processing format. Weather observations were recorded at the start of each flight and a coded survey conditions number was noted as often as conditions change. Time was recorded each time a new station is started and ended.

Because of the speed at which observations must be made from aircraft, only a limited number of environmental parameters were recorded. Choppy water and diving birds made species identification and number estimation difficult. Photographs were taken where it was practical-largely for enumeration of large flocks.

A second survey was conducted at higher altitudes (300-400 ft) to map habitat types and to denote the storm tide line wherever possible. Mapping was done on USGS 1:63,360 maps on areas where this scale map was available. This process is only conducted once per area but cannot be done until late May or June in most areas.

D. Localities See attached maps (Figures 1-5).

E. Data collected

In the Kodiak Archipelago 28 randomly selected plus three other count units were completed during this report period. About 30 species were seen in six habitat types. In this survey a definite trackline was not followed.

During the pelagic surveys in Lower Cook Inlet 450 mautical miles were covered in Kamishak Bay and 118 nautical miles in outer Kachemak bay. Fifteen species were recorded in these open water transects.

Over 800 miles of shoreline were flown from Cape Fairweather to Cordova in Northeast Gulf of Alaska surveying birds and mapping shoreline. Approximately 45 species were observed in at least eight habitat types. In addition 150 miles of transects were flown in the Copper River Delta region.

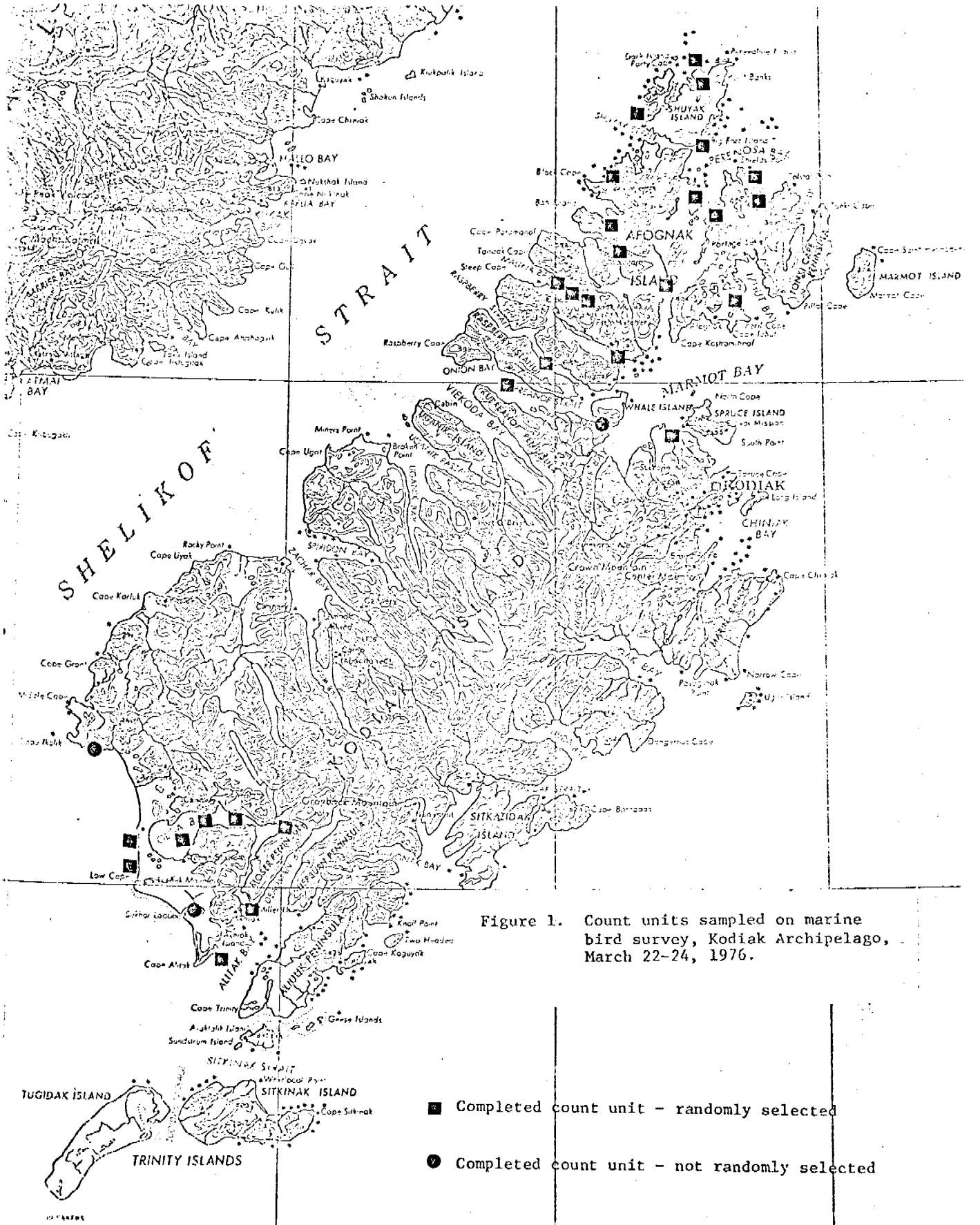

Figure 1. Count units sampled on marine bird survey, Kodiak Archipelago, March 22-24, 1976.

■ Completed count unit - randomly selected

● Completed count unit - not randomly selected

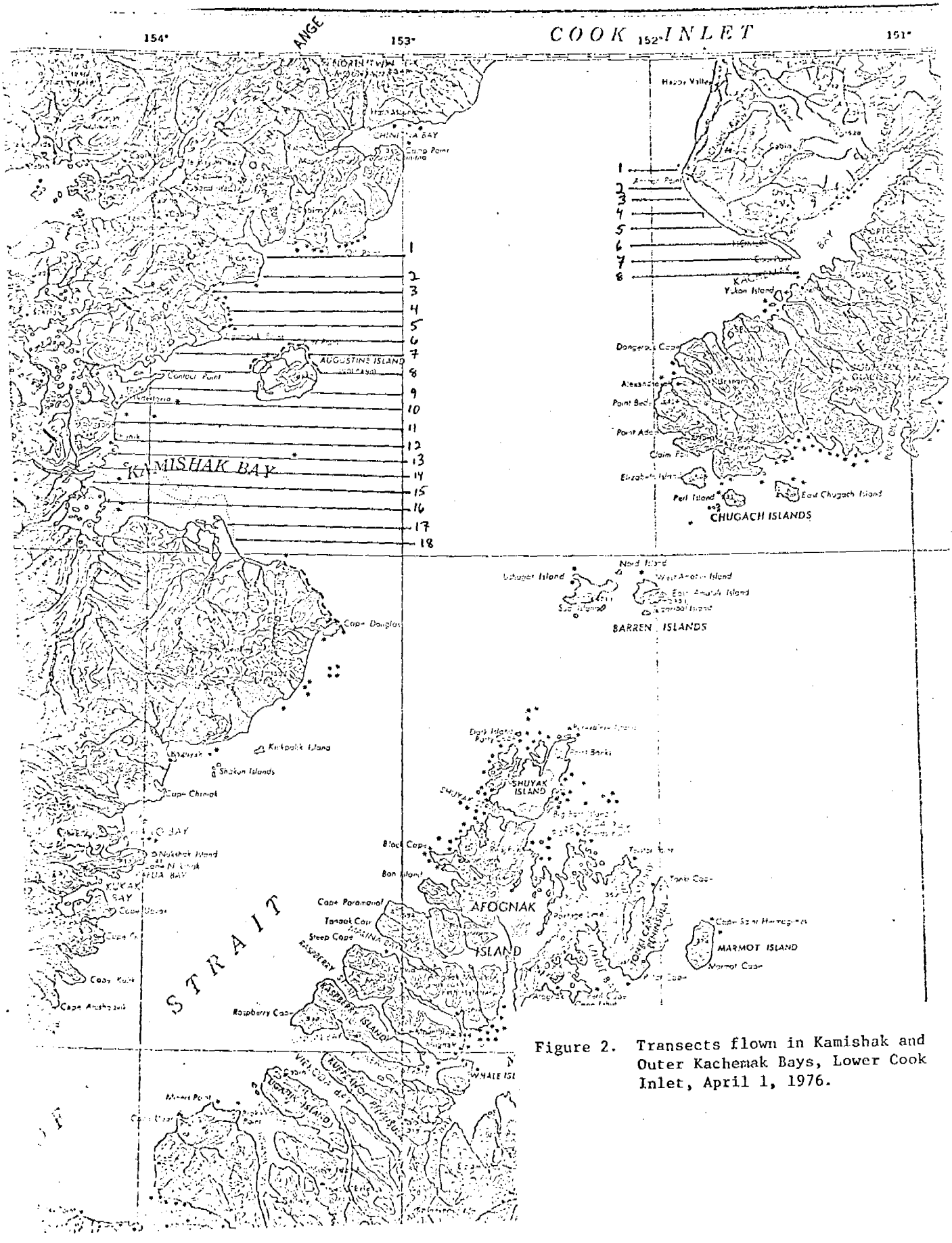

Figure 2. Transects flown in Kamishak and Outer Kachemak Bays, Lower Cook Inlet, April 1, 1976.

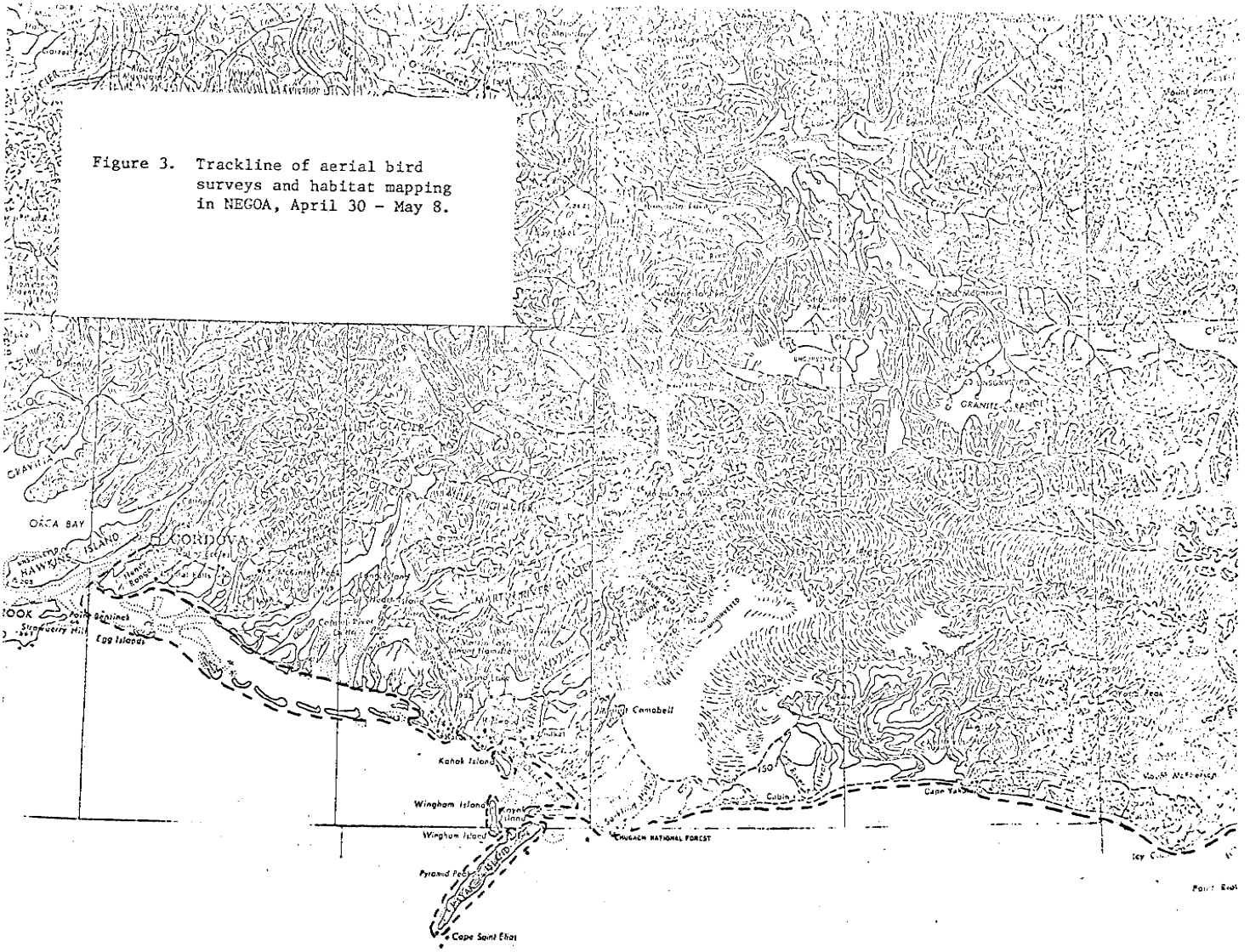

Figure 3. Trackline of aerial bird surveys and habitat mapping in NEGOA, April 30 - May 8.

Figure 3. (continued)

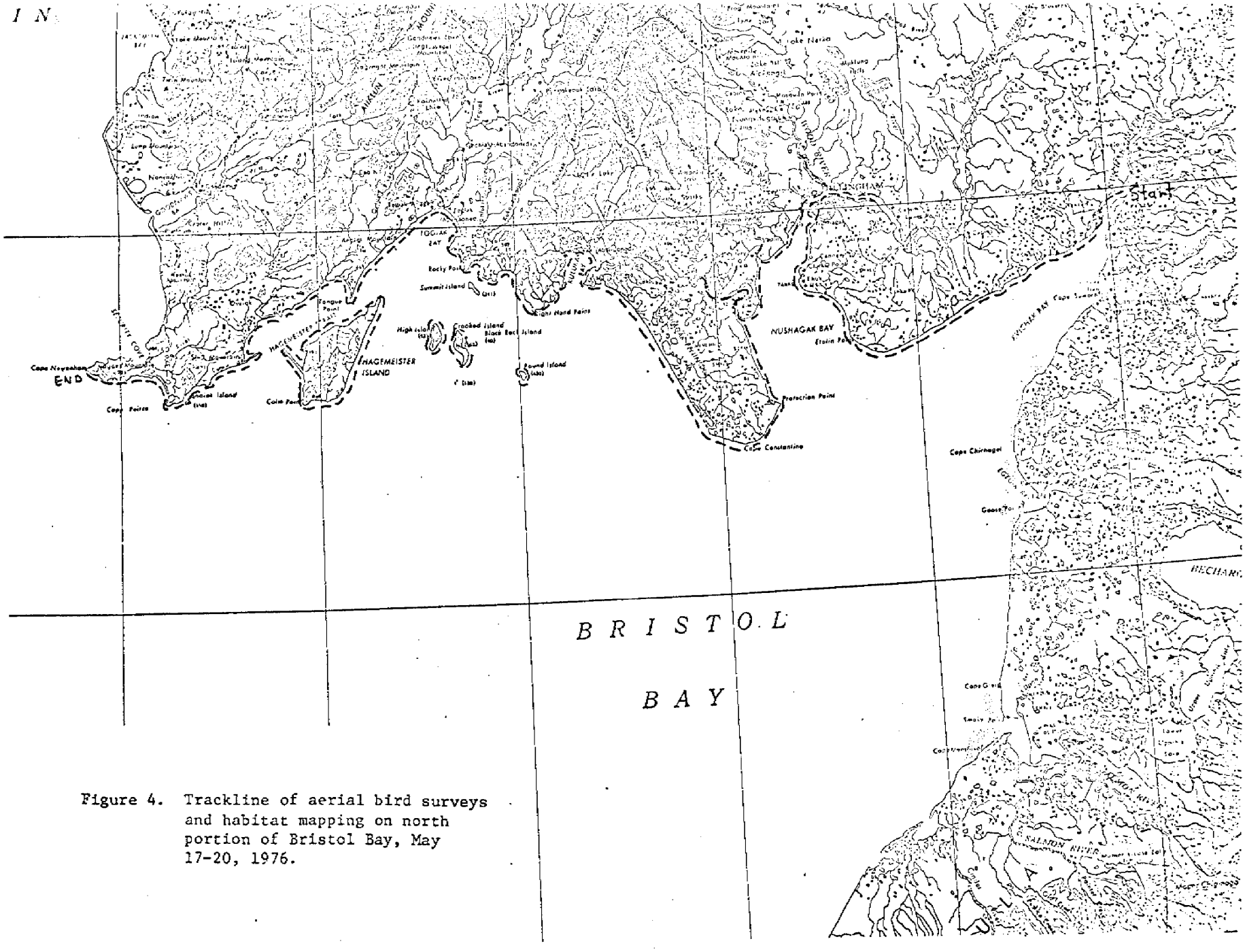

Figure 4. Trackline of aerial bird surveys and habitat mapping on north portion of Bristol Bay, May 17-20, 1976.

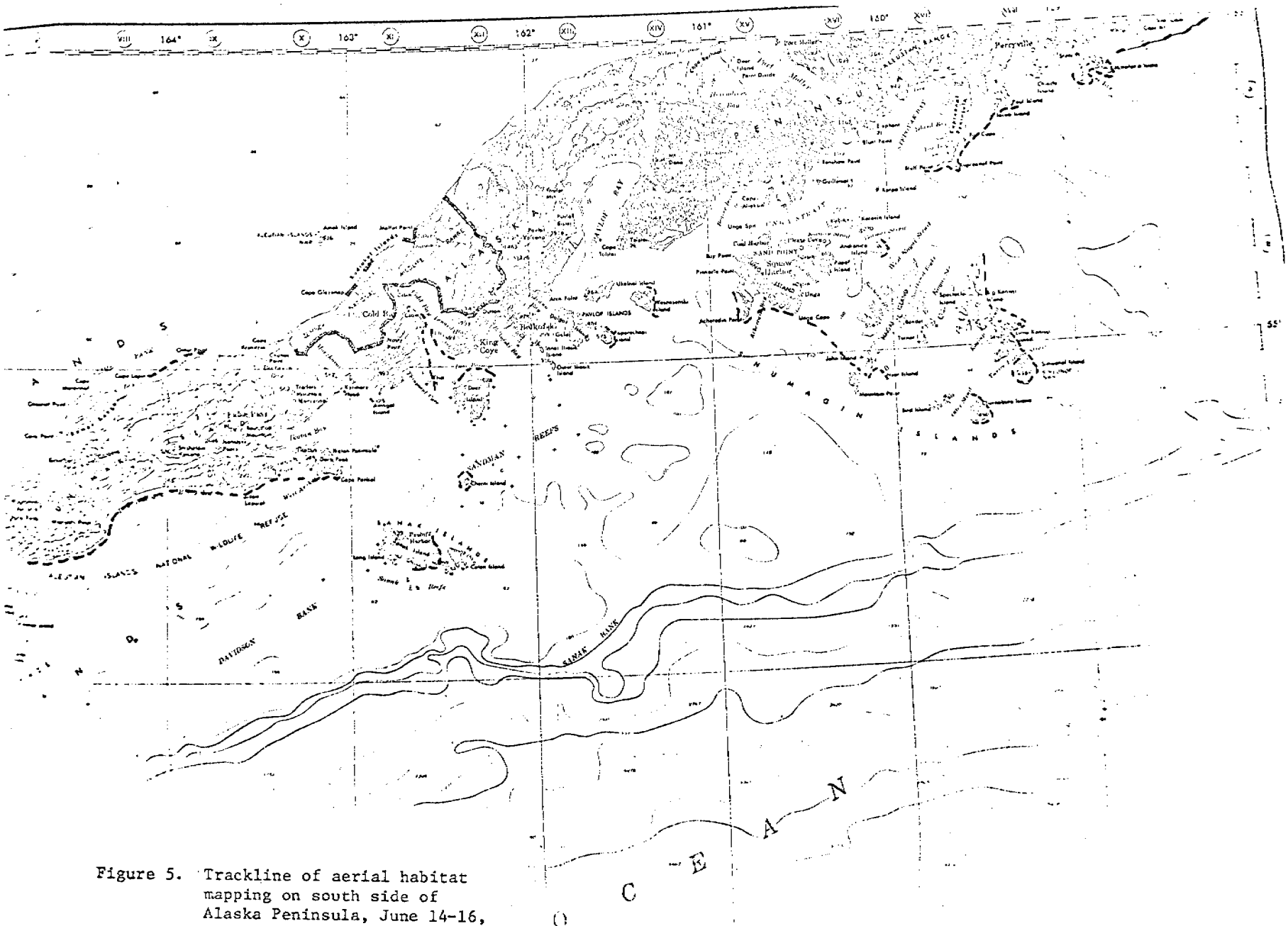

Figure 5. Trackline of aerial habitat mapping on south side of Alaska Peninsula, June 14-16, 1976.

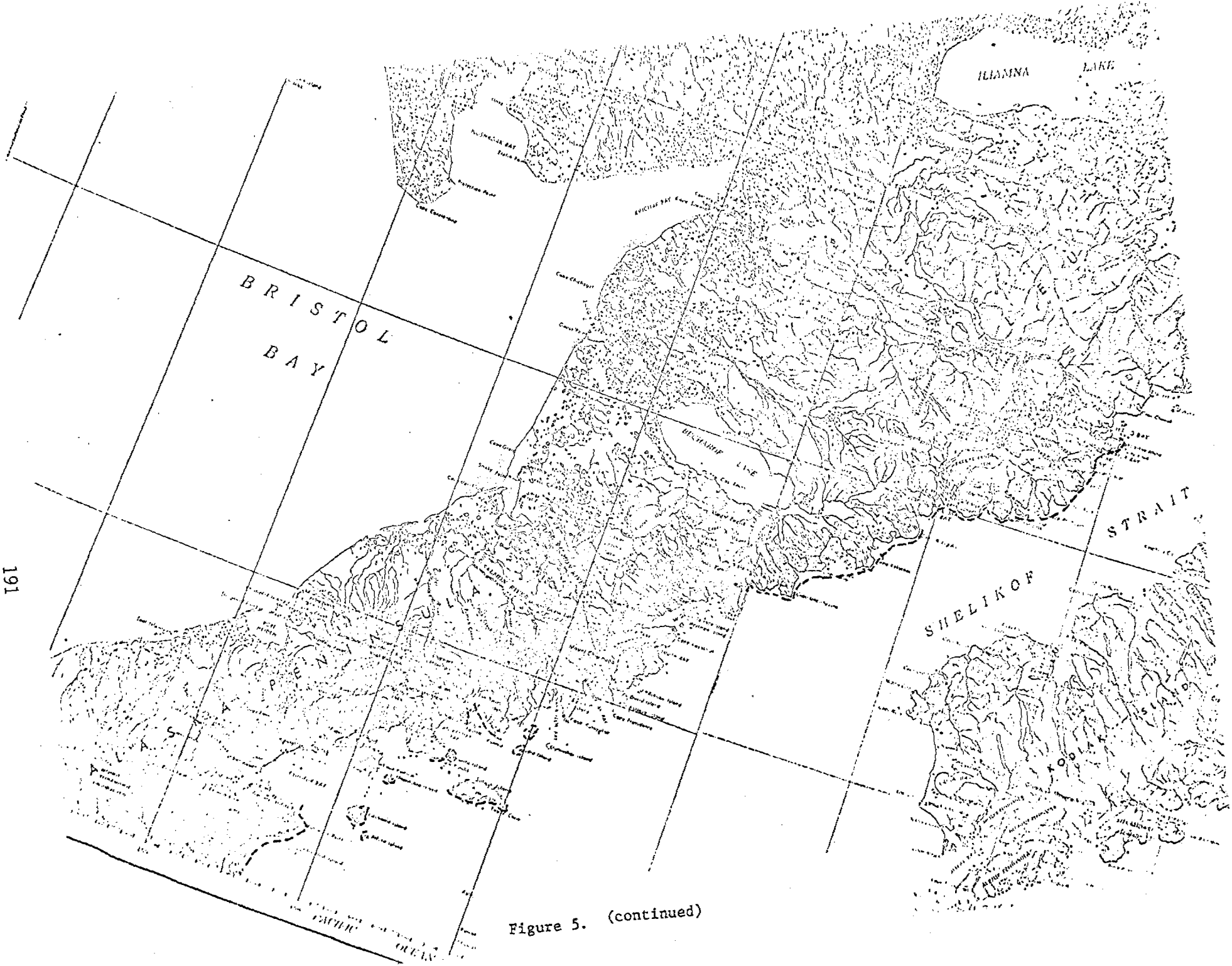

Figure 5. (continued)

On the north side of Bristol Bay 500 miles of shoreline (including Hagemeister Island) were surveyed and mapped. The other Walrus Islands (40 miles of shoreline) were mapped only. Again 45 species were observed in about eight habitat types.

Approximately 540 miles of shoreline along the south side of the Alaska Peninsula were mapped and miscellaneous bird observations made by Dave Kurhajec while accompanying a marine mammal survey crew.

III. The final format for data processing is the final stages of acceptance by NOOC/EDS. Therefore, no survey data has yet been transcribed. It is hoped that all surveys will be transcribed and analyzed by the next quarterly report.

On shoreline surveys of the Kodiak Archipelago, the 28 randonly selected count units surveyed in early March meant 76 total units were surveyed. Densities of birds appeared to be substantially less in the forested bays of Afognak-Shuyak Islands in comparison with non-forested areas on Kodiak Island but absolute numbers are not yet known.

Preliminary analysis of the pelagic surveys in Lower Cook Inlet indicated marked differences in species composition and densities between Kamishak and outer Kachemak Bays (Table 1.) Most of the eiders within Kamishak Bay transects were Common Eiders (Somateria mollissima) and several thousand more were observed outside the transects in the vicinity of Augustine Island. The majority of alcids observed were murres (Uria sp.)

Table 1. Differences in bird densities and species composition between Kamishak and outer Kachemak Bay. April 1, 1976.

	Kamishak	Outer Kachemak
% Eiders	54	13
% Scoters	2	67
% Total Seaducks (includes unid.)	87	81
Alcids	Tr.	18
Cormorants and Loons	1	1
Gulls	12	1
Birds/Km^2	21.4	60.9

During surveys from April 30-May 8 in NEGOA, staging areas for shorebirds were noted since the peak of spring migration was occurring for many shorebird species. The majority of migrant waterfowl had already passed and the arctic tern migration was just

commencing. Many loons and notable numbers of dark phase parasitec jaegers (Sterorarius parasitius) were also observed as well as resident gulls. Inclement weather precluded surveying on several days but did not appear to deter bird migration.

Fewer shorebirds (than expected) were observed in north Bristol Bay during surveys on May 17-20 but large numbers of waterfowl were staging in lagoons, fluvial floodplains, and nearshore coastal waters. Most noteworthy were large numbers of greater scaup (Aythy marila) in nearshore saltwater along with scoters and meagansers. Most inland ponds were still frozen and the ducks were likely waiting for spring breakup before leaving coastal waters. Many loons and grebes were also present on nearshore waters along with alcids and larids in the vicinity of their breeding colonies.

Habitat types mapped in Bristol Bay are summarized in Table 2. A notable change in habitat types appears to occur in the Togiak area and further analysis will reveal if bird densities and species composition are reflected by this change.

The primary purpose of the June 14-16 flights was to survey marine mammals. Therefore, few bird observations were made and only partial habitat mapping was accomplished. An estimated 47,600 alcids, shearwaters and kittiwakes were observed one mile offshore just north of Izembek Lagoon.

Table 2. Quantity of various habitat types for the beach of the north side of Bristol Bay, Kuichak River to Cape Newenham and Walrus Islands.

	Shoreline in Miles											Area in Square Miles				
	Mud	Mud & Sand	Sand	Gravel	Rock	Sand & Rock	Gravel & Rock	Rock & Sand	Sand & Gravel	Gravel & Sand	Rock & Gravel	Mud Flats	Sand Flats	Mud & Sand Flats	Mixed Forbes (Inter-tidal)	Elymus
Cape Horn to Etolin Point	24.7	3.5	34.1									10.25	27.38	19.78	19.69	
Etolin Point to Dillingham	81.3	0	16.7									23.80	0	4.62	59.38	
Dillingham to Cape Constantine	95.0	3.3	30.1									45.10	.05	0	55.27	
Cp. Constantine to Tvativak Bay	0	0	40.8	0	2.6	0	3.8					3.54	.27	0	21.57	
Tvativak Bay to Right Hand Point	0	0	12.2	0	2.1	9.0	3.6	0.9			1.4	0.94	.24	0	9.45	
Right Hand Point to Togiak	5.1	0	7.6	0.9	10.9	0.7	5.1		9.4			0.24	0	0	5.78	
Togiak to Tongue Point	0	0	13.8		1.6	0.3			4.3						0.61	0.71
Tongue Point to Asigyukpak Spit	0	0	24.1		2.1		1.9		9.6						2.73	1.21
Asigyukpak Spit to Cape Newenham	0	0	17.2	1.1	18.7				0.3	0.6	5.3				2.64	
Hagemeister Is.	0	0	48.4	3.0	6.5	1.4	0.6	2.7	0.2		1.5			3.92	0.69	3.31
Summit Is.			1.4		1.5		3.5									
High Is.			1.3		1.6	1.3	2.8				3.1					0.07
Crooked Is.			3.6	0.8	4.3	0.4	1.2				1.5				0.09	
Round Is.				1.2	1.7		1.7									
Total	206.1	6.8	251.3	7.0	53.6	13.1	24.2	3.6	23.8	0.6	12.8	83.87	27.94	28.32	177.90	5.30

IV. Interpretation of results.

No interpretation will be attempted until the data is transcribed when the data processing format is finalized by EDS.

V. Problems - nothing noteworthy.

VI. Estimate of funds expended.

Salaries	$ 9,750
Per diem/travel	2,000
Logistics (air charter, etc.)	9,000
Commodities	750
Equipment	114
Total	$21,614