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THE DISTRIBUTION OF MARINE BIRDS
ON
GEORGES BANK AND ADJACENT WATERS

Progress Report No. 3
for Period
July - September 1978

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DEPARTMENT OF ENERGY
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Abstract

From 21 June to 16 September 1978, 8 cruises aboard U.S. and Canada Coast Guard cutters and research vessels from the National Marine Fisheries Service and AtlantNIRO, Kaliningrad, USSR were made in the following areas: U.S. mid- and north-Atlantic continental shelf, western North Atlantic basin, Atlantic Canada, and Hudson Strait and Bay. Excluding those Canadian areas sampled, 18,136 marine birds of 22 species were counted in 941.99 km² sampled from 1002 fixed-area transects. An equal number of 10-minute total bird counts (no fixed area) were conducted at the same time.

Data collected from January to June 1978 have been punched. Data from cruises covered in this report have been transcribed, proofed, verified and submitted to USFWS Migratory Bird and Habitat Research Laboratory. Eighteen of 24 MBO cruises made in 1977 have been transcribed.

A cruise conducted 14-28 August was dedicated to the feeding ecology and distribution of marine birds on Georges Bank and contiguous waters. A total of 126 specimens of 9 species was collected. An analysis of the stomach contents of those birds will be made by AtlantNIRO, Kaliningrad, USSR.

The progress report describes briefly the scope of investigations undertaken and discusses significant results obtained. The principal investigator has devoted 100% of his time to the project in the third quarter (July - September 1978) and will devote full time to the fourth quarter (October - December 1978).

1. Bird distributions: Cape Hatteras to the Gulf of Maine.

From 21 June to 16 September 1978, 8 cruises were made by staff and volunteer observers aboard U.S. and Canada Coast Guard cutters and research vessels from the National Marine Fisheries Service and AtlantNIRO, Kaliningrad, USSR (Table 1). Reports were written for each cruise and are appended to the progress report.* The regions surveyed in the third quarter, excluding areas covered on cruise no. 7818 (17-29 July), are

*See Distribution Lists.

TABLE 1.

List of Dates, Vessel, Cooperating Agencies, Ports of Departure,
and Observers for MBO Cruises made in Third Quarter of 1978.

MBO CRUISE NO.	CRUISE DATES	VESSEL	COOPERATING AGENCY AND PORT	OBSERVER
7813	22 Jun-02 Jul	R/V ALBATROSS IV	NOAA/NMFS (Woods Hole)	R.S. Heil
7814	21-28 Jun	R/V ALIOT	USSR and NOAA/NMFS (Woods Hole)	G.L. Pittman
7815	05-17 Jul	R/V ALBATROSS IV	NOAA/NMFS (Woods Hole)	A.F. Mason
7816	06-20 Jul	CGC VIGILANT	USCG (New Bedford)	A.W. Nickerson
7817	16-31 Jul	R/V ALIOT	USSR and NOAA/NMFS (Woods Hole)	J. Dugdale
7818	17-29 Jul	CCGS NARWHAL	CWS and CCGS (Halifax)	K.D. Powers
7819	14-28 Aug	R/V ALIOT	USSR and NOAA/NMFS (Woods Hole)	K.D. Powers
7820	13-16 Sept	R/V ALBATROSS IV	NOAA/NMFS (Woods Hole)	G.L. Pittman

listed with summary data of bird densities and area sampled from fixed-area transects (Table 2). In addition, 1002 total bird counts were made at the same time that fixed-area transects were conducted. Total bird count data are compiled in summary tables and are graphically illustrated with selected species distribution maps in each cruise report. A cruise schedule for October in the fourth quarter is presented in Table 3.

A narrative summary of bird distributions by species and species group for July - September is as follows:

Albatrosses, fulmars, shearwaters, storm-petrels. An unidentified albatross (*Diomedea* sp.) was observed on 13 July at 42°24'N, 68°22'W in the Gulf of Maine.

Although Northern Fulmars (*Fulmarus glacialis*) were commonly seen in central and eastern Gulf of Maine in late June and July, their abundance greatly decreased from that recorded in early June. One sighting of two fulmars was recorded on Georges Bank on 16 July, and several fulmars were observed in the Northeast Channel in mid-September. There were no sighting records of fulmars in August.

Greater Shearwaters (*Puffinus gravis*) were the most abundant species on Georges Bank in July. Tens of thousands of Greaters were evident on the Northeast Peak of Georges Bank in July, in addition to flocks of several hundred in the Cultivator Shoals, Great South Channel and Stellwagen Bank areas, which extend into the Gulf of Maine. In August, the only major concentration of this species was recorded in the Great South Channel and probably constituted thousands of Greaters.

Cory's Shearwaters (*Puffinus diomedea*) were infrequently recorded in July in the Southern New England and Georges Bank areas. In August, flocks of 10-50 Cory's mixed with Greater Shearwaters were observed in the Great South Channel, where surface schools of Atlantic Saury (*Scomberesox saurus*) were noted.

Several thousand Sooty Shearwaters (*P. griseus*) were estimated with the Greater Shearwater concentration recorded on the Northeast Peak in July. Sooties were prevalent in the Great South Channel in July and August, and common in the Gulf of Maine in July. The range of Sooties did not extend south of the Southern New England region (39°N latitude).

A flock of 50 Manx Shearwaters (*P. puffinus*) were counted in July in association with the shearwater concentration recorded on the Northeast Peak and their total abundance in the area probably exceeded a hundred birds. Sightings of individual Manx were regularly recorded in waters off the continental shelf, north of 39°N latitude in July.

One sighting of Audubon's Shearwater (*P. lherminieri*) was made in the mid-Atlantic area in July. Four positive and three probable sightings totaling 7 Audubon's were recorded in the Southern New England area in August.

Although sightings of Leach's Storm-Petrels (*Oceanodroma leucorhoa*) were recorded on Georges Bank and the Gulf of Maine in July and August, their abundance was greater in slope waters off the continental shelf. Several Leach's were caught on ships during the night in July and August.

TABLE 2.

Regional Summary of Bird Densities using Fixed-Area Transects
Conducted in Third Quarter of 1978.

REGION	NUMBER OF TRANSECTS	AREA SURVEYED (km ²)	TOTAL BIRDS (TB)	RELATIVE DENSITY (TB/km ²)
Gulf of Maine	259	246.39	6,478	26.29
Georges Bank	182	170.38	9,162	53.77
Southern New England	217	207.46	963	4.64
Middle Atlantic	118	112.31	129	1.15
Off Continental Shelf	169	153.73	1,184	7.70
North Coastal	6	5.85	19	3.25
South Coastal	51	45.87	201	4.38

TABLE 3.

Tentative Schedule of MBO Cruises to be Conducted
in Fourth Quarter of 1978 (October - December).

CRUISE DATES	VESSEL AND AGENCY	PORT OF DEPARTURE
29 Sept - 17 Oct	CGC DUANE	Portland
01-24 Oct	R/V ANTON DOHRN (FRG and NMFS)	Woods Hole
02-23 Oct	CGC VIGOROUS (USCG)	New London

Wilson's Storm-Petrels (*Oceanites oceanicus*) were abundant and widespread in July and August. Flocks of several hundred to a thousand Wilson's were recorded in deep waters of the Gulf of Maine in July. In August their density was greatest in deep water along the southern edge of the continental shelf in the Georges Bank and Southern New England areas. Considerable numbers of Wilson's were noted south in mid-Atlantic waters along the edge of the shelf in July.

Gannets. Several sightings of Gannets (*Morus bassanus*) were recorded in the Gulf of Maine throughout the period covered by this report.

Phalaropes. Phalaropes were recorded in each month during the period covered by this report. Both Northern (*Lobipes lobatus*) and Red Phalarope (*Phalaropus fulicarius*) were identified in August and September but represent only 5 sightings.

Jaegers and skuas. Although both Pomarine (*Stercorarius pomarinus*) and Parasitic Jaegers (*S. parasiticus*) were recorded, the former were more common. Nineteen sightings totaling 25 Pomarines were made on Georges Bank and the Gulf of Maine in August, and 8 Pomarines were counted in September.

One sighting of an individual light-phased Long-tailed Jaeger (*S. longicaudus*) was recorded on the Northeast Peak in July.

Skuas were seen in each month covered by this report and although not all were identified, most birds were believed to be Great Skuas (*Catharacta skua*). Collecting efforts provided 2 Great Skua specimens. One bird had been banded as a chick on Foula I. in the Shetlands in 1977.

Gulls and terns. Great Black-backed Gulls (*Larus marinus*) and Herring Gulls (*L. argentatus*) were recorded in large flocks throughout coastal New England in July but were uncommon offshore. Black-backs were recorded in the Gulf of Maine in July. Juveniles of both species were observed offshore in August on Georges Bank and the Gulf of Maine, often in the vicinity of domestic fishing activities.

A possible sighting of an adult Lesser Black-backed Gull (*L. fuscus*) was made in August in the Gulf of Maine, but species identification was based only on size and mantle color.

Four sightings of Black-legged Kittiwakes (*Rissa tridactyla*) were made in the Gulf of Maine in August.

Laughing Gulls (*L. atricilla*) were common coastally in the mid-Atlantic area in July and often ship-followed.

Tern (*Sterna* spp.) sightings were recorded in shelf waters of New England in July and August. Both Common (*S. hirundo*) and Arctic (*S. paradisaea*) Terns were recorded on Georges Bank and Gulf of Maine. Several Common Terns were identified in mid-Atlantic waters in July.

Sandwich Terns (*Thalasseus sandvicensis*) and Royal Terns (*T. maximus*) were also recorded in coastal areas of the mid-Atlantic region.

Alcids. A single Common Puffin (*Fratercula arctica*) was seen in July approximately 3 miles E of Matinicus Rock in the Gulf of Maine.

2. Data transcription. Data collected from January to June 1978 have been keypunched onto magnetic tape. Data from cruises covered in this report have been transcribed, proofed, verified and submitted to USFWS Migratory Bird and Habitat Research Laboratory. To date 18 of 24 MBO cruises made in 1977 have been transcribed. No coding work has yet been initiated on 1976 information.

3. Investigation of food resources. A cruise dedicated to the feeding ecology and distribution of marine birds on Georges Bank and adjacent waters was undertaken 14-28 August aboard the USSR R/V ALIOT. This premier event in U.S. Atlantic marine ornithology was a cooperative effort involving AtlantNIRO (Kaliningrad, USSR), National Marine Fisheries Service (Woods Hole), Manomet Bird Observatory, and Peabody Museum at Yale University. Kevin D. Powers was designated Chief Scientist for this cruise. A total of 126 specimens of 9 species were collected. An analysis of the stomach contents of those specimens will be made by AtlantNIRO in 6-12 months. In addition to stomach content analyses, blood samples from most specimens were collected by Dr. Fred C. Sibley, Peabody Museum at Yale University for taxonomic research using isolated DNA. The final disposition of most specimens will be museum skeletons in the bird collection at the Peabody Museum; however several museum skins will be made for the Manomet Bird Observatory reference collection.

No significant work was accomplished concerning the distribution of selected fish species based on NMFS groundfish data.

DISTRIBUTION LISTS

List A

Senator Edward M. Kennedy

Congressman Gerry Studds

Congressman Paul Tsongas

Ralph Andrews, USFWS

H.C. Boyar, NOAA/NMFS, Woods Hole

Kenneth Sherman, NOAA/NMFS, Narragansett

Philip Stanton, Wildlife Rehabilitation Center, Upton, MA

R.G.B. Brown, Canadian Wildlife Service

List B

Contracting Officer, DOE

Kathleen S. Anderson, MBO

Principal Investigator

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 22 June - 2 July 1978

Cruise No. 7813

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Richard S. Heil, Staff Intern, aboard R/V ALBATROSS IV from 22 June - 2 July 1978. The objectives of the cruise were to survey ichthyoplankton-zooplankton, and conduct an Oceanographic Primary Productivity Survey. The observer was aboard the vessel on a non-interference basis primarily to collect information on the distribution and abundance of marine birds.

Manomet Bird Observatory gratefully acknowledges the cooperation of the National Marine Fisheries Service for permitting observations aboard R/V ALBATROSS IV and H.C. Boyar, Vessel Coordinator, for arranging passage. The observer thanks Captain Beatteay, the officers and crew, and the chief scientist, John Sibunka, for their assistance aboard ship. Financial support for Manomet Bird Observatory Seabird Studies is provided by the U.S. Department of Energy under contract No. EE-78-02-4706.

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds

by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km². A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10-minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Tables 1-6 summarize the relative density and relative abundance bird data, and list sightings of rare or infrequently observed marine bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours. Figure 2a-e indicate the distribution of five bird species using the greatest total 10-minute count of each species per 10-minute square latitude/longitude block surveyed.

Shearwaters

Cory's Shearwaters (*Puffinus diomedea*) were uncommon but widespread in both shallow and deep waters. Singles and pairs were typically encountered, there being no large concentrations. Two Cory's appeared to be ship following for more than four minutes on 23 June at 36°21'N, 74°37'W.

Greater Shearwaters (*Puffinus gravis*) were encountered on only 21.5% of the transect counts, totaling but 67 individuals. Most of the birds were

seen in deeper waters - usually near the continental shelf edge, and 21% were seen in the cooler, more northerly waters of the southern New England region. Probably due to the very low densities involved, virtually no individuals ship followed. The distribution of all the shearwaters and Wilson's Storm-Petrels appeared to be in no way associated with fishing vessels, which were few and far between. Apparently at this season the majority of the Greater and Sooty Shearwaters in the Western North Atlantic spend at least a portion of their non-breeding season in the cooler waters of the Grand and Georges Banks and become less numerous as one goes south along the shelf.

Sooty Shearwaters (*Puffinus griseus*) were almost entirely absent, having recorded only four individuals. One was seen flying SSE out of Vineyard Sound at 41°22'N, 70°52'W on 1 July.

A lone Audubon's Shearwater (*Puffinus iherminieri*) was encountered on 24 June, flying south close to shore (about eight miles southeast of Oregon Inlet, N.C.) at 35°39'N, 75°20'W, in an area where the species is common later in summer.

Petrels

At 2315 hrs. on 26 June at 37°40'N, 74°02'W, approximately 65 miles offshore, and roughly corresponding to the latitude of Cedar Is., Va., was a Leach's Storm-Petrel (*Oceanodroma leucorhoa*) which flew on board. The feet, webs, and tarsus were solid black, and the tail was deeply forked. The possibility of the accidental Harcourt's Storm-Petrel (*Oceanodroma castro*) was ruled out by the presence of an indistinct gray line of feathering running down the center of the white rump patch, as well as by the deeply forked tail. The bird possessed neither a cloacal protuberance or brood patch. It was assumed that this bird was a non-breeding individual, since the nearest breeding colony is at Penikese Is., Buzzards Bay, MA., some 315 miles to the

NNE, despite the fact that Leach's Storm-Petrels in the Gulf of Maine are believed to regularly undertake foraging expeditions which may take them over 200 miles from the breeding colonies along the coast of Maine and Nova Scotia.

Wilson's Storm-Petrel (*Oceanites oceanicus*) was the most common and widespread species observed at sea, being seen on 63 percent of the transect counts. The largest concentrations were noted in deeper water in the vicinity of the shelf edge. At several locations large gatherings of petrels resting on the water were encountered: 150 at 36°21'N, 74°37'W, on 23 June; and five sitting groups totaling 800 individuals at 35°15'N, 74°46'W on 24 June. Wilson's Storm-Petrels were seen ship following on 36 percent of the transect counts.

Gannet

) A single sub-adult Gannet (*Morus bassanus*) was observed flying east past Gay Head, M.V., Mass. at 41°22'N, 70°52'W on 1 July.

Skua and Jaegers

An unidentified skua (*Catharacta* sp.) was seen feeding amidst trash and offal thrown overboard at 37°26'N, 73°50'W on 26 June. It appeared all dark at the closest it came (perhaps 400 m.), and lacked any noticeable light nape patch or hackling.

One adult, light phase Pomarine Jaeger (*Stercorarius pomarinus*) was observed pirating a food item from a Greater Shearwater at 41°11'N, 71°01'W on 22 June.

An immature Parasitic Jaeger (*Stercorarius parasiticus*), not of the dark phase, was encountered traveling ENE at 36°44'N, 74°23'W on 25 June.

Two unidentified jaegers (*Stercorarius* sp.), both non-adults, and not dark phased, were seen; one on 24 June at 36°11'N, 75°06'W, the other particu-

larly close to the N. Carolina shore at $36^{\circ}56'N$, $75^{\circ}39'W$ on 25 June.

Gulls and terns

Great Black-backed Gulls (*Larus marinus*) and Herring Gulls (*Larus argentatus*) were scarce at sea. Herring numbered only 57 individuals during transect counts. All at-sea Herring Gulls were adults, and none were encountered in deep waters or south of $39^{\circ}20'N$ latitude. Laughing Gulls (*Larus atricilla*) totalled 220; most were recorded ship-following in shallow coastal waters.

Two "portlandica" (first year plumage) terns, either *Sterna hirundo* or *S. paradisaea* were seen; one at $36^{\circ}51'N$, $74^{\circ}20'W$ on 23 June, the other sitting on a floating log at $39^{\circ}17'N$, $73^{\circ}53'W$ on 28 June. Royal Terns (*Sterna maximus*) were regularly seen within 10 miles from shore between New Jersey and Cape Hatteras, N.C. One Royal was encountered on 30 June, about 15 miles NE of Hudson Canyon, on the shelf edge at $39^{\circ}52'N$, $71^{\circ}49'W$. Four Sandwich Terns (*Sterna sandvicensis*) were observed several miles off Cape Hatteras, N.C. on 24 June.

TABLE 1.

Seabird Density in Selected Regions Within Fixed Area Transects

22 June - 1 July 1978

<u>Region</u>	<u>Number of Transects</u>	<u>Total Km² Surveyed (TKm²)</u>	<u>Total Birds (TB)</u>	<u>Mean Density₂ (TB/TKm²)</u>	<u>Density Range (TB/KM²/Transect)</u>
Southern New England	18	18.18	34	1.87	0.00 - 8.51
South Coastal	28	26.28	62	2.36	0.00 - 8.74
Middle Atlantic	51	53.50	61	1.14	0.00 - 9.52
Off Continental Shelf	33	33.97	184	5.42	0.00 - 38.83

TABLE 2.

Number of Birds Per Species in Selected Regions

Using Fixed Area Transects

22 June - 1 July 1978

<u>Species</u>	<u>Southern New England</u>	<u>South Coastal</u>	<u>Middle Atlantic</u>	<u>Off Continental Shelf</u>
Cory's Shearwater	2	2	25	7
Greater Shearwater	14	3	39	11
Sooty Shearwater	1	1	1	1
Unid. Shearwater	0	0	11	4
Wilson's Storm-Petrel	22	13	227	923
Double-crested Cormorant	0	10	0	0
Great Black-backed Gull	4	2	0	0
Herring Gull	27	27	3	0
Laughing Gull	7	192	21	0
Common Tern	1	29	2	0
Royal Tern	0	50	1	0
Unid. Tern	0	11	1	2

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

22 June - 1 July 1978

Species	No.	Date	Location	Remarks
Sooty Shearwater	1	6-24	35°56'N, 75°23'W	Flying N.
Audubon's Shearwater	1	6-24	35°39'N, 75°20'W	Flying S.
Leach's Storm-Petrel	1	6-26	37°40'N, 74°02'W	AHY, flew on board at 2330 hrs.; measured, and photographed.
Gannet	1	7-1	41°22'N, 70°52'W	3W, flying.
White-winged Scoter	3	6-29	39°46'N, 74°02'W	Swimming.
Pomarine Jaeger	1	6-22	41°11'N, 71°01'W	Lt. phase ad., stole fish from Greater Shearwater.
Parasitic Jaeger	1	6-25	36°44'N, 74°23'W	Imm., not dark phase, traveling ENE.
Unid. jaeger	1	6-24	36°11'N, 75°06'W	Sub-ad. traveling SW.
Unid. jaeger	1	6-25	36°56'N, 75°39'W	Imm. flying N, low over water.
Unid. skua	1	6-26	37°26'N, 73°50'W	Dark appearing at 400 m. flew in to feed on discharged trash and offal.
Sandwich Tern	2	6-24	35°44'N, 75°24'W	Ads., flying and diving to feed.
Sandwich Tern	1	6-24	35°50'N, 75°29'W	Ad. ship following.
Sandwich Tern	1	6-24	35°56'N, 75°23'W	Flying NE.
Royal Tern	1	6-30	39°52'N, 71°49'W	Ad., circled ship.

TABLE 4.

List of Marine Mammal Sightings

22 June to 1 July 1978

Species	No.	Date	Location	Remarks
Unid. rorqual	1	6-22	40°03'N, 71°55'W	Surfacing, moving N.
Unid. whale	1	6-22	40°03'N, 71°55'W	Blow only.
Grampus	5	6-23	38°19'N, 73°11'W	Surfacing.
Unid. rorqual	4	6-23	38°14'N, 73°15'W	Surfacing.
Minke whale	5	6-23	38°08'N, 73°19'W	Surfacing.
Saddleback Dolphin	50+	6-23	37°47'N, 73°27'W	Surfacing.
Unid. dolphin	9	6-23	37°30'N, 73°56'W	Moving away.
Grampus	5	6-23	37°20'N, 74°01'W	Surfacing.
Unid. dolphin	30	6-23	36°57'N, 74°16'W	Moving N.
Unid. dolphin	110	6-23	36°51'N, 74°20'W	Leaping.
Saddleback Dolphin	90	6-23	36°44'N, 74°25'W	Bow riding.
Pilot Whale	6	6-23	36°34'N, 74°30'W	Surfacing.
Saddleback Dolphin	50	6-23	36°34'N, 74°30'W	Surfacing.
Unid. dolphin	20	6-23	36°34'N, 74°30'W	Surfacing.
Unid. rorqual	3	6-23	36°29'N, 74°34'W	Surfacing.
Pilot Whale	12	6-23	36°29'N, 74°34'W	Lounging/sleeping.
Striped Dolphin	80	6-23	36°29'N, 74°34'W	Surfacing.
Striped Dolphin	60	6-23	36°21'N, 74°37'W	Bow riding.
Unid. Dolphin	50	6-23	36°12'N, 74°43'W	Swimming toward us.
Pilot Whale	3	6-23	36°12'N, 74°43'W	Sleeping/lounging.
Unid. Dolphin	4	6-23	37°13'N, 74°05'W	Leaping.
Grampus (poss.)	3	6-23	37°02'N, 74°12'W	Surfacing.

TABLE 4 (continued)

<u>Species</u>	<u>No.</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Pilot Whale	14	6-24	36°15'N, 74°46'W	Lob-tailing.
Spotted Dolphin	10	6-24	36°18'N, 74°55'W	Bow riding.
Striped Dolphin	6	6-25	36°44'N, 74°27'W	Swimming alongside ship.
Saddleback Dolphin	20	6-25	36°44'N, 74°27'W	Bow riding.
Bottlenosed Dolphin	4	6-26	37°33'N, 74°09'W	Bow riding.
Unid. dolphin	5	6-29	40°15'N, 73°32'W	Bow riding briefly.
Unid. dolphin	7	6-30	39°27'N, 72°05'W	Surfacing.
Grampus	4	6-30	39°27'N, 72°05'W	Surfacing.

TABLE 5.

List of Non-Marine Bird Sightings

22 June - 1 July 1978

<u>Species</u>	<u>No.</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Osprey	1	6-25	36°49'N, 74°50'W	Ad. flying ENE, about 1 - 2' above water surface.
American Kestrel	1	6-30	39°53'N, 71°48'W	Ad. male, landed on crow's-nest.
Mourning Dove	1	6-30	39°52'N, 71°49'W	Ad. circling ship, then alighting.
Barn Swallow	2	6-23	36°51'N, 74°20'W	Ads., following ship.
Barn Swallow	1	6-24	36°18'N, 74°55'W	Ad., following ship.
Barn Swallow	1	6-28	39°10'N, 74°22'W	Ad. flying W toward land.
Gray Catbird	1	6-29	40°08'N, 73°43'W	Ad. alighted on bow.
Brown-headed Cowbird	1	6-29	40°17'N, 73°46'W	Ad. male, alighted on bow.
Indigo Bunting	1	6-23	37°47'N, 73°30'W	Ad. female, alighted on ship.

FIGURE 1. Cruise track during day-
light hours, 22 June -
1 July 1978, Northern
Sector.

76 75 74 73 72

FIGURE 1. Cruise track during daylight hours, 22 June - 1 July 1978, Southern Sector.

FIGURE 2a. Distribution map of
Cory's Shearwater,
22 June - 1 July 1978,
Northern Sector.

FIGURE 2a. Distribution map of
Cory's Shearwater,
22 June - 1 July 1978,
Southern Sector.

FIGURE 2b. Distribution map of
Greater Shearwater,
22 June - 1 July 1978,
Northern Sector.

FIGURE 2b. Distribution map of
Greater Shearwater,
22 June - 1 July 1978,
Southern Sector.

FIGURE 2c. Distribution map of
Wilson's Storm-Petrel,
22 June - 1 July 1978,
Northern Sector.

FIGURE 2c. Distribution map of Wilson's Storm-Petrel, 22 June - 1 July 1978, Southern Sector.

FIGURE 2d. Distribution map of
Herring Gull, 22 June-
1 July 1978,
Northern Sector.

FIGURE 2d. Distribution map of
Herring Gull, 22 June -
1 July 1978,
Southern Sector.

FIGURE 2e. Distribution map of
Laughing Gull,
22 June - 1 July 1978,
(Southern Sector, only).

Cruise No. 7813

TABLE 6. Summary of Transect or Station Census Data.

Ship Activities and IV

Observers R.S. HEIL

[illegible]

TABLE 6. Summary of Transect or Station Census Data.

Observers R.S. HEIL

[illegible]

TABLE 6. Summary of Transect or Station Census Data.

Observers R. S. HEIL

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TABLE 6. Summary of Transect or Station Census Data.

Observers R.S. HEIL

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Cruise No. 7813

TABLE 6. Summary of Transect or Station Census Data.

h1p R/V ALBATROSS IV

Observers

R. S. HEIL

[illegible]

TABLE 6. Summary of Transect or Station Census Data.

Observers R. S. HEIL

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TABLE 6. Summary of Transect or Station Census Data.

Observer R. S. HEIL

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TABLE 6. Summary of Transect or Station Census Data.

Observers R.S. HEIL

[illegible]

TABLE 6. Summary of Transect or Station Census Data.

Observers R. S. HEIL

Transect ☒ Station ☐ No.	121	122	123	124	125	126	127	128	129	130						
Date (GMT)	6/30	6/30	6/30	6/30	6/30	6/30	6/30	6/30	7/1	7/1						
Region*	00	00	00	SNE	SNE	SNE	SNE	SNE	SC	SC						
Latitude (to nearest min.)	39-16	39-21	39-27	39-39	39-44	39-48	39-53	39-58	41-22	41-25						
Longitude (to nearest min.)	72-01	72-03	72-05	72-02	71-57	71-53	71-48	71-42	70-52	70-48						
Water depth (meters)	1647	1128	617	174	178	172	156	99	29	18						
Total fixed-area (F.A.) birds	0	10	23	0	1	0	1	0	3	5						
Area Sampled (km ²)	1.02	1.04	1.14	1.04	1.03	1.03	1.04	1.06	0.54	1.18						
Density (F.A. birds/km ²)	0	9.62	20.18	0	0.97	0	0.96	0	5.56	4.24						
Species	Number Observed															
CORY'S SHEARWATER F.A.							0									
Tot.							1									
GREATER SHEARWATER F.A.					1		1		3							
Tot.					1		2		3							
BOYD'S SHEARWATER F.A.									0							
Tot.									1							
WILSON'S STORM-PETREL F.A.		10	23	0		0	0	0								
Tot.		17	25	1		2	1	1								
DOUBLE-CRESTED CORMORANT F.A.										2						
Tot.										10						
GREAT BLACK-BACKED GULL F.A.										0						
Tot.										2						
HERRING GULL F.A.									0	1						
Tot.									5	16						
COMMON TERN F.A.										2						
Tot.										2						
UNID. TERN F.A.										0						
Tot.										2						

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 21 - 28 June 1978

Cruise No. 7814

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Galen L. Pittman, Staff Biologist, Manomet Bird Observatory, aboard the Soviet research vessel R/V ALIOT from 21 - 28 June 1978. The objective of the cruise was to monitor changes in early ichthyoplankton and their predators and prey using standard MARMAP sampling methods in the Gulf of Maine, Georges Bank, and Southern New England waters. The observer was aboard on a non-interference basis primarily to collect information on the distribution and abundance of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the U.S.S.R. for permitting observations aboard the R/V ALIOT. The observer thanks the Master, Captain Leonid Sleptsoav, officers Anatoliy Prokhozov, Vladimir Mukhin, and Nikolay Yakinovich, and crew of the R/V ALIOT for their friendliness and assistance aboard ship. Special thanks are extended to the Soviet scientific crew, particularly Leonid Bugaev, ornithologist. Finally, acknowledgement is extended to H.C. Boyar, Vessel Coordinator for the National Marine Fisheries Service, for arranging passage aboard ship, and the Department of Energy for support (DOE Contract No. EE-78-S-02-4706).

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km². A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10-minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Tables 1 - 6 summarize the relative density and abundance bird data, and list sightings of rare or infrequently observed marine bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours. Figures 2a-h indicates the distribution of eight bird species using the greatest total count of each species per 10-minute square latitude/longitude block surveyed.

Greater Shearwaters and Wilson's Storm-Petrels were abundant and widespread, particularly in the Gulf of Maine, but no large concentrations of

Greater Shearwaters were recorded. Sooty Shearwaters were common in small numbers in the Gulf of Maine, while Northern Fulmars were only infrequently recorded in the Gulf of Maine. Leach's Storm-Petrels were uncommon north of Georges Bank. The large majority of the unidentified storm petrels reported were probably Wilson's Storm-Petrels.

The large gulls, Herring and Great Black-backed Gulls, were sighted infrequently throughout the cruise and only in small numbers. Herring Gull distribution was primarily coastal, whereas Great Black-backed Gulls were found offshore in the Gulf of Maine. Neither species was prevalent on Georges Bank.

On June 27 at least four Cory's Shearwaters were recorded near slope waters of Southern New England, south of Nantucket Shoals. Also a Manx Shearwater was sighted at 40°13'N, 70°28'W on June 28. A Parasitic Jaeger and an unidentified skua were sighted on June 26 at approximately 41°20'N, 69°07'W, while a Pomarine Jaeger was seen at 40°13'N, 69°53'W on the next day.

One additional note is the general lack of birds present on the western half of Georges Bank and the eastern sector of the Southern New England region during this cruise. This dearth of bird life south and east of Cape Cod was striking in contrast with the relative abundance of birds in the Gulf of Maine.

TABLE 1.

Seabird Density in Selected Regions in Fixed Area Transects

21 - 28 June 1978

<u>Region</u>	<u>Number of Transects</u>	<u>Total Km² Surveyed (Tkm²)</u>	<u>Total Birds (TB)</u>	<u>Mean Density (TB/Tkm²)</u>	<u>Density Range (TB/Km²/Transect)</u>
Gulf of Maine	59	54.87	2375	43.28	0.00 - 1191.40
Georges Bank	21	19.53	76	3.89	0.00 - 40.86
Southern New England	31	28.83	51	1.77	0.00 - 8.60

TABLE 2.

Number of Birds Per Species In Selected Regions (Using Fixed-Area Counts Only)

21 - 28 June 1978

<u>Species</u>	<u>Georges Bank</u>	<u>Southern New England</u>	<u>Gulf of Maine</u>
Northern Fulmar	2	0	12
Greater Shearwater	60	23	447
Sooty Shearwater	6	1	22
Cory's Shearwater	0	4	0
Manx Shearwater	0	1	0
Leach's Storm-Petrel	0	2	19
Wilson's Storm-Petrel	2	7	1707
Unid. storm-petrel	6	2	137
Pomarine Jaeger	0	1	0
Parasitic Jaeger	0	0	1
Great Black-backed Gull	0	1	25
Herring Gull	0	9	5

TABLE 3.

List of Rare or Infrequent Bird Sightings

21 - 28 June 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Gannet	1	6/22	42°51'N, 69°56'W	Not attracted to ship, subadult.
Unid. skua	1	6/26	41°20'N, 69°07'W	Landed in flock of Greater and Sooty Shearwaters.
Parasitic Jaeger	1	6/26	41°18'N, 69°07'W	Showed curiosity toward ship.
Pomarine Jaeger	1	6/27	40°13'N, 69°53'W	Meandered through transect.
Cory's Shearwater	3	6/27	40°16'N, 69°59'W	Milling around ship.
Cory's Shearwater	1	6/27	40°17'N, 69°17'W	Milling around ship.
Manx Shearwater	1	6/28	40°13'N, 70°28'W	Meandering through transect.

TABLE 4.

List of Marine Mammal Sightings

21 - 28 June 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Possible Finback	1	6/24	41°55'N, 69°46'W	Large rorqual seen diving.
Pilot Whale	3-4	6/26	40°56'N, 68°43'W	Porpoising.
Probable White-sided Dolphin	6-8	6/26	41°47'N, 69°47'W	Porpoising and jumping.

TABLE 5.

List of Non-Marine Bird Sightings

21 - 28 June 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Brown-headed Cowbird	1	6/22	43°24'N, 70°12'W	On deck for at least 3 days.
Yellow Warbler	1	6/22	43°24'N, 70°12'W	Circling Ship.

FIGURE 1. Approximate cruise track during daylight hours, 21-28 June 1978.

FIGURE 2b. Distribution map of
Greater Shearwater,
21-28 June 1978.

FIGURE 2a. Distribution map of
Northern Fulmar,
21-28 June 1978.

FIGURE 2c. Distribution map of
Sooty Shearwater,
21-28 June 1978.

FIGURE 2d. Distribution map of
Leach's Storm-Petrel,
21-28 June 1978.

FIGURE 2e. Distribution map of
Wilson's Storm-Petrel
21-28 June 1978.

FIGURE 2f. Distribution map of unidentified storm-petrels, 21-28 June 1978.

FIGURE 2g. Distribution map of
Great Black-backed
Gull, 21-28 June
1978.

FIGURE 2h. Distribution map of
Herring Gull,
21-28 June 1978.

Observers Galen L. Pittman

Transect ☒ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date (GMT) June 1979	21	21	21	21	21	21	21	21	21	21	21	21	21	22	22
Region*	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM
Latitude (to nearest min.)	41-45	41-45	41-45	41-59	42-09	42-17	42-45	42-45	42-51	42-51	43-02	43-03	43-03	43-24	43-13
Longitude (to nearest min.)	62-45	63-43	62-40	62-39	63-36	63-37	63-32	63-32	63-33	63-33	63-32	63-35	63-34	70-12	70-06
Water depth (meters)	165	164	162	167	185	176	205	172	175	197	168	135	115	95	140
No. of Ripole Within Transect	2	2	3	1	3	7	12	27	6	21	11	2	5	14	4
Area Sampled (km ²)	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Birds / km ²	12.90	27.96	33.33	10.75	46.24	7.53	13.58	29.03	6.45	22.58	19.14	3.23	5.38	15.05	4.30
Species	Number Observed														
Northern Fulmar	WT	5	3	0			0	1	0	1	0	2	2		
	TOT	5	3	0			1	2	0	2	0	2	2		
Grey Seal	WT	11	23	6	10	42	7	12	20	47	7	9	1	1	3
	TOT	46	23	33	35	48	12	28	60	94	12	16	5	3	5
Common Shearwater	WT		1	0	0	1		3	0	0	0		1		
	TOT		1	1	2	1		3	2	1	1		1		
Leach's Storm Petrel	WT		2												
	TOT		2												
Wilson's Storm Petrel	WT			25	0	0	0	1	3	0	10	11	0	10	1
	TOT			29	2	3	2	3	23	2	40	12	30	22	1
Unid. Storm Petrel	WT	1	0	0				0	0	10					
	TOT	14	2	4				10	20	15					
Herring Gull	WT												0	0	
	TOT												1	1	
Giant Black-backed Gull	WT								1	3		0	1		
	TOT								1	3		2	2		

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Cruise No. 7814

Table 6. Summary of Transect or Station Census Data.

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Observers

Galen L. Pittman

Transect ☒ Station ☐ No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Date(GMT) JUNE 1978	23	23	23	23	23	23	23	23	23	23	23	24	24	24	24	24
Region*	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM
Latitude(to nearest min.)	42-34	42-32	42-27	42-22	42-17	42-12	42-07	42-02	41-57	41-52	41-47	41-42	41-37	41-32	41-27	41-22
Longitude(to nearest min.)	62-24	62-22	62-24	62-24	62-24	62-24	62-24	62-24	62-24	62-24	62-24	62-24	62-24	62-24	62-24	62-24
Water depth(meters)	203	205	218	200	178	165	185	175	164	145	110	190	210	200	215	215
No. of Birds / 1000 m ²	0	13	12	0	0	5	7	7	6	7	7	2	2	0	2	1
Area Sampled(km ²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.93	0.93	0.93	0.93
Length / km	0.00	13.33	12.90	0.00	0.00	5.33	3.23	3.23	65.59	32.23	0.00	23.65	1.00	2.15	1.00	1.00
Species	Number Observed															
Black-throated Petrel WT	0															
WT	1															
Greater Shearwater WT	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WT	1	5	29	1	10	15	15	10	15	10	10	10	10	10	10	10
Lesser Shearwater WT	0	2	0	0	0	0	0	0	0	0						
WT	5	6	3	1	4	2	2	3	2							
Leach's Storm-Petrel WT			3									2				
WT			3									2				
Wilson's Storm-Petrel WT						3	3	2	60							
WT						4	3	4	60							
Unid. Storm-Petrel WT					0	2		0	1	0		20				1
TOT					1	2		1	1	25		20				1
Herring Gull WT												0	0	0	2	
TOT												1	1	1	2	
Great Black-backed Gull WT	0	0	0	0	0	1		1						0		
TOT	7	3	10	5	1	3		1						1		
Unid. Birds WT												0				
TOT												100				

Table 6. Summary of Transect or Station Census Data.

Observers Galen Pittman

Transect ☒ Station ☐ No.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
Date (GMT) June 1978	24	24	24	24	24	24	24	24	24	24	24	24	24	25	25	25
Region*	GM	GM	GM	GM	GM	GM	GM	GR	GR	GR	GR	GR	GR	GR	GR	GR
Latitude (to nearest min.)	41-54	41-56	41-58	41-58	41-57	41-55	41-53	41-50	41-45	41-37	41-36	41-38	41-07	40-58	40-57	40-57
Longitude (to nearest min.)	69-11	69-04	68-49	68-37	68-30	68-23	68-15	68-10	68-09	68-09	68-06	68-01	68-04	67-54	67-47	67-47
Water depth (meters)	217	195	140	172	175	207	218	110	45	30	25	32	41	53	57	57
No. of Birds Within Transects	4	7	4	5	161	20	1	4	7	0	5	4	0	0	0	0
Area Sampled (km ²)	0.92	0.93	0.93	0.92	0.97	0.94	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Birds / km ²	4.30	7.53	4.30	5.39	173.12	21.51	1.03	4.30	7.53	0.00	5.39	4.30	0.00	0.00	0.00	0.00
Species	Number Observed															
North Ocean Fulmar	WT				1			1				1				
	TOT				1			1				1				
Greater Shearwater	WT	0	0	4	5	60		0	3	7	0	4	2	0	0	0
	TOT	7	1	4	10	165		10	16	13	12	9	4	5	3	3
Sooty Shearwater	WT				0			0			0	1	1			
	TOT				1			3			1	1	1			
Leach's Storm-Petrel	WT							1								
	TOT							1								
Wilson's Storm-Petrel	WT	4			0	100	20	0								
	TOT	4			7	552	50	2								
Wid. Storm-Petrel	WT							0					0			
	TOT							2					1			
Great Black-backed Gull	WT												0			
	TOT												1			

Table 6. Summary of Transect or Station Census Data.

Observers Galen L. Pittman

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Table 6. Summary of Transect or Station Census Data.

Observers

Transect ☒ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date (GMT)	27	27	27	27	27	28	28	28	28	28	28	28	28	28	28
Region*	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE
Latitude (to nearest min.)	40-28	40-28	40-35	40-41	40-45	40-43	40-42	40-40	40-42	40-45	40-44	40-43	40-43	40-43	40-40
Longitude (to nearest min.)	69-52	69-59	70-04	70-09	70-00	70-28	70-34	70-45	70-45	70-49	70-52	70-56	70-59	71-04	71-06
Water depth (meters)	73	67	55	45	35	115	120	129	130	150	89	80	73	60	60
No. of Birds within Transects	1	1	5	2	2	1	1	2	1	1	1	1	2	0	1
Area Sampled (km ²)	2.12	2.22	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11
Birds / km ²	1.03	1.08	5.38	2.15	2.15	1.03	1.03	2.15	1.03	1.03	1.03	1.03	2.15	2.22	1.03
Species	Number Observed														
Greater Shearwater WT	1	1	4	1	0		1	2	0	0	0	1	2	0	1
TOT	1	1	5	1	3		1	4	4	5	3	1	4	3	1
Sooty Shearwater WT				1	0										
TOT				1	3										
Unid. Large Shearwater WT							0		0				0		
TOT							1		2				1		
Manx Shearwater WT						1									
TOT						1									
Leach's Storm-Petrel WT										1					
TOT										1					
Wilson's Storm-Petrel WT									1		0				
TOT									1		4				
Unid. Storm-Petrel WT			1				0		0	1					
TOT			1				1		3	2					
Herring Gull WT					1										
TOT					1										
Great Black-backed Gull WT					1										
TOT					1										
Unid. Bird WT									0						
TOT									3						

Table 6. Summary of Transect or Station Census Data.

Observers Gordon L. Piman

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MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 5 - 17 July 1978

Cruise No. 7815

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Ann F. Mason, Staff Biologist, Manomet Bird Observatory, aboard the R/V ALBATROSS IV from 5 - 17 July 1978. The objective of the cruise was to conduct an ichthyoplankton-zooplankton, oceanographic, and primary productivity survey in the waters of the Gulf of Maine, Southern New England, Georges Bank, and part of the mid-Atlantic Bight. The observer was aboard on a non-interference basis primarily to collect information on the distribution and abundance of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the National Marine Fisheries Service (NMFS) for permitting observations aboard the R/V ALBATROSS IV. The observer thanks the master, Captain Walter E. Beatteay, officers, and crew of the R/V ALBATROSS IV, in addition to John Sibunka, Chief Scientist, and the scientific crew for their assistance aboard ship. Special thanks are extended to Gary Carter, College of the Atlantic, who assisted in marine mammal identification. Finally, acknowledgement is extended to H.C. Boyar, Vessel Coordinator for NMFS, for arranging passage aboard ship, and the Department of Energy for support (DOE Contract No. EE-78-S-02-4706).

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data

were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km². A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10-minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Tables 1 - 6 summarize the relative density and relative abundance bird data, and list sightings of rare or infrequently observed bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours. Figures 2a-g indicate the distribution of five bird species using the greatest total count of each species per 10-minute square latitude/longitude block surveyed.

Wilson's Storm-Petrels were abundant in the Gulf of Maine and along the edges of Georges Bank. The largest flock of 350 birds was encountered on July 14 off of the Maine coast at 43°30'N, 68°50'W where most seemed to be moving in a general westerly direction. Although likely to have been present, no Leach's Storm-Petrels were positively identified.

About 600 Greater Shearwaters were found sitting, feeding, and flying near the Cultivator Shoals on the northern edge of George's Bank on July 13. More than half followed our ship as it moved between stations. Elsewhere, they were recorded in consistently low numbers. Sooty Shearwaters were present in low numbers throughout the cruise. No Cory's or Manx Shearwaters were observed during the cruise.

Northern Fulmars were seen throughout the central Gulf of Maine.

Herring Gulls and Great Black-backed Gulls were abundant within thirty miles of shore but were sparse elsewhere except along the Northern Edge of Georges Bank. The largest sighting of gulls was a flock of 1000 milling over a fishing boat near Matinicus Rock.

Six individual skuas were sighted during the cruise, but were not identified to species. No jaegers were observed.

Laughing Gulls, Terns, and Double-crested Cormorants were observed when within 10 miles of shore.

Two flocks of phalaropes sp. (one group of 12, one group of 6) were sighted on July 13, at 42°40'N, 68°19'W and at 42°45'N, 68°46'W respectively.

A Common Puffin was sighted flying east three miles off of Matinicus Rock on July 14.

Of particular interest was the sighting of an albatross (*Diomedea* sp.) flying west on July 13 at 42°24'N and 68°22'W.

Finally, two small oil slicks were seen. The first, on July 14, was approximately 1/2 mile by 100 yards located at 43°19'N, 68°45'W. A dead gull and shearwater were floating nearby. The second on July 16 was 1/4 mile long and oval shaped and was located at 40°56.5'N, 69°09.5'W.

TABLE 1.

Seabird Density in Selected Regions in Fixed Area Transects

5 - 17 July 1978

<u>Region</u>	<u>Number of Transects</u>	<u>Total Km² Surveyed (Tkm²)</u>	<u>Total Birds (TB)</u>	<u>Mean Density₂ (TB/Tkm²)</u>	<u>Density Range (TB/Km²/Transect)</u>
Gulf of Maine	77	74.11	1024	13.82	0 - 382.79
Southern New England	61	61.95	84	1.36	0 - 6.86
Georges Bank	25	25.95	444	17.11	0 - 394.10
South Coastal	6	4.82	63	13.07	0 - 52.00
North Coastal	1	1.02	15	14.71	
Off Continental Shelf	1	1.02	2	1.96	

TABLE 2.

Number of Birds Per Species in Selected Regions

(Within Fixed Area Transects)

5 - 17 July 1978

<u>Species</u>	<u>Gulf of Maine</u>	<u>Southern New England</u>	<u>Georges Bank</u>	<u>South Coastal</u>	<u>North Coastal</u>	<u>Off Conti- nental Shelf</u>
Northern Fulmar	11		4			
Greater Shearwater	307	44	421	34		2
Sooty Shearwater	24	10		20		
Wilson's Storm-Petrel	558	14	8			
Unid. Storm Petrel	4	8		1		
Gannet	1					
Great Black-backed Gull	55	3	6	1	12	
Herring Gull	47	5	4	7	3	
Laughing Gull			1			
Unid. Large Gull	1					
Common Tern	2					
Unid. Tern	13					
Common Puffin	1					

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

5 - 17 July 1978

Species	Number	Date	Location	Remarks
Unid. terns	2	7-07	41°01'N, 71°09'W	Traveling N.
Laughing Gull	1	7-09	41°58'N, 69°52'W	Traveling SE.
Common Tern	1	7-09	42°12'N, 69°57'W	Traveling SE.
Unid. skua	1	7-11	41°20'N, 69°07'W	Traveling N.
Unid. skua	1	7-11	40°40'N, 69°05'W	Circled ship twice.
Unid. skua	1	7-11	40°25'N, 69°03'W	Traveling ESE.
Unid. tern	1	7-11	40°06'N, 69°01'W	Traveling ESE.
Unid. skua	1	7-13	41°52'N, 68°11'W	Flying 3/4 mile off.
Unid. skua	1	7-13	41°53.5N, 68°17'W	Traveling WNW.
Unid. albatross	1	7-13	42°24'N, 68°22'W	Flying W.
Unid. phalarope	12	7-13	42°40'N, 68°19'W	Traveling ENE.
White-winged Scoter	1	7-13	42°45'N, 68°46'W	Dove as ship passed, then flew.
Unid. phalarope	6	7-13	42°45'N, 68°46'W	Traveling SW.
Common Tern	2	7-14	43°38'N, 68°55'W	Circling ship.
Unid. tern	25	7-14	43°43'N, 68°51'W	Flying.
Common Puffin	1	7-14	43°43'N, 68°51'W	Traveling SE.
Unid. tern	6	7-14	43°49'N, 68°44'W	Feeding, diving for food.
Unid. skua	1	7-15	42°44'N, 67°41'W	Traveling SE, very close to ship.
Unid. tern	1	7-15	42°20'N, 67°42'W	Traveling N.
Gannet	1	7-15	43°44'N, 67°43'W	Traveling N.

TABLE 4.

List of Marine Mammal Sightings

5 - 17 July 1978

Species	Number	Date	Location	Remarks
Humpback (prob.)	1	7-5	41°03.5N, 71°32'W	Surfacing, spouting.
Finback (poss.)	1	7-5	40°05'N, 72°38'W	Spouting.
Finback (prob.)	17-20	7-6	40°00'N, 72°35'W	Surfacing.
Finback (prob.)	2	7-7	40°58'N, 71°13'W	Surfacing, spouting, circling, probably feeding. Storm-Petrels, shearwaters and gulls in area.
Finback (prob.)	3-4	7-7	40°41'N, 71°02'W	Surfacing, spouting.
Finback (prob.)	1	7-7	40°41'N, 71°02'W	Surfacing, spouting.
Unid. dolphin	40-50	7-7	39°48'N, 70°35'W	Porpoising.
White-sided Dolphin	8	7-8	40°23'N, 69°23'W	Generally heading SW, porpoising, some jumping, some spyhopping, feeding, coralling. Shearwaters present.
Finback (prob.)	1	7-9	41°59'N, 69°56'W	Heading S, surfacing, spouting.
Finback (poss.)	1	7-9	42°02'N, 69°59'W	Spouting.
Saddleback Dolphin	9-11	7-9	42°15'N, 69°45'W	Heading W, porpoising.
Finback	2	7-9	42°10'N, 70°06'W	Surfacing, circling, 20-30 Herring Gulls circling above. White side of mouth clearly seen.
Finback (prob.)	15-20	7-9	42°08'N, 70°17'W	Spouting, Herring Gulls above.
Finback (poss.)	1	7-9	42°19'N, 70°21.5'W	Spouting.
Finback (prob.)	5	7-9	42°10'N, 70°01'W	Surfacing.

TABLE 4. (continued)

Species	Number	Date	Location	Remarks
Finback (prob.)	3-4	7-11	49°12'N, 69°05'W	Surfacing, spouting, circling.
White-sided Dolphin	30-40	7-11	41°04'N, 69°04'W	Traveling fast NE, avoided ship, perhaps feeding, 30 Shearwaters with them.
White-sided Dolphin	15	7-11	40°57'N, 69°09'W	Heading NE, porpoising.
Unid. dolphin	50-60	7-11	40°30'N, 69°05'W	Circling, swimming, jumping, probably feeding, 20-30 Greater Shearwaters flying with them.
Saddleback Dolphin	6-8	7-11	40°29'N, 69°05'W	Heading N toward other group, probably feeding.
Pilot Whale (prob.)	3-5	7-11	40°22'N, 69°02'W	Heading away from ship about 1-1/2 miles off.
Saddleback Dolphins	5-7	7-11	40°12'N, 69°01'W	Heading slowly south, some porpoising. Also two sharks nearby.
Saddleback Dolphins	6-8		40°05'N, 69°01'W	Heading NE, 1 jumping.
Saddleback Dolphins (poss.)	10-20	7-12	40°29'N, 68°36'W	Surfacing.
Pilot Whales	5-7	7-12	40°18'N, 68°02'W	Heading slowly SW, surfacing, may have been sleeping.
Pilot Whales	6-7	7-12	40°56'N, 68°36'W	Heading slowly SW, one had young with her.
Unid. dolphin	9-11	7-12	41°14'N, 68°16'W	Heading SE, swimming steadily only showing dorsal fin.
Unid. dolphin	10-15	7-12	41°17'N, 68°29'W	Heading E, dolphins following about 200 yds. behind finbacks. Finbacks diving.
Finback (prob.)	2			

TABLE 4. (continued)

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Finback (prob.)	1	7-12	41°19.5'N, 68°37'W	Heading steadily N. Big roll on terminal dive.
Finback (prob.)	1	7-13	41°52'N, 68°11'W	Heading W at variable speeds; spouting.
Right Whale	4-5	7-13	41°55.5'N, 68°24'W	Floundering, playing, circling, spouting, 200 Greater Shearwaters in area but not paying much attention to whales.
Unid. large whale	1	7-13	42°19'N, 68°22'W	Tail flukes seen splash- ing down on water.

TABLE 5.

List of Non-Marine Bird Sightings

5 - 17 July 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>
Mourning Dove	1	7-11	41°20'N, 69°07'W
Brown-headed Cowbird	2	7-12	40°43'N, 68°12'W
Barn Swallow	1	7-16	41°24'N, 67°37'W

72 71
 FIGURE 1. Cruise track during
 daylight hours, 5-17
 July 1978. Northern
 Sector.

FIGURE 1. Cruise track during daylight hours, 5-17 July 1978. Southern Sector.

FIGURE 2a. Distribution map of
Northern Fulmar,
5-17 July 1978,
Northern Sector.

FIGURE 2a. Distribution map of
Northern Fulmar,
5-17 July 1978,
Southern Sector.

FIGURE 2b. Distribution map of
Greater Shearwater,
5-17 July 1978,
Northern Sector.

FIGURE 2b. Distribution map of
Greater Shearwater,
5-17 July 1978,
Southern Sector.

FIGURE 2c. Distribution map of
Sooty Shearwater,
5-17 July 1978,
Northern Sector.

FIGURE 2c. Distribution map of
Sooty Shearwater,
5-17 July 1978,
Southern Sector.

FIGURE 2d. Distribution map of
Wilson's Storm-Petrel,
5-17 July 1978,
Northern Sector.

FIGURE 2d. Distribution map of
Wilson's Storm-Petrel,
5-17 July 1978,
Southern Sector.

FIGURE 2e. Distribution map of
Great Black-backed
Gull, 5-17 July 1978,
Northern Sector.

FIGURE 2e. Distribution map of
Great Black-backed
Gull, 5-17 July 1978,
Southern Sector.

FIGURE 2f. Distribution map of
Herring Gull, 5-17
July 1978, Northern
Sector.

Cruise No. 7815

Table 6. Summary of Transect or Station Census Data.

11p R/v Albatross

Observers AFM

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Table 6. Summary of Transect or Station Census Data.

Observers AFM

[illegible]

Cruise No. 7815

Table 6. Summary of Transect or Station Census Data.

11p R/V 11-21-75

Observers

Transect ☒ Station ☐ No.	C31	C32	C33	C34	C35	C36	C37	C38	C39	C40	C41	C42	C43	C44
Date(GMT)	7-7	7-7	7-7	7-7	7-7	7-7	7-7	7-8	7-8	7-8	7-8	7-8	7-8	7-8
Region*	SNE	SNE	SNE	SNE	SNE	SNE	SNE	OCS	SNE	SNE	SNE	SNE	SNE	SNE
Latitude(to nearest min.)	40-39	40-25	40-24	40-21	40-13	40-06	40-03	39-53	40-44	40-50	40-57	41-00	40-52	40-48
Longitude(to nearest min.)	70-59	70-53	70-53	70-52	70-48	70-44	70-43	70-38	70-35	70-35	70-34	70-30	70-23	70-19
Water depth(meters)	76	86	60	95	125	134	134	554	55	53	51	48	48	48
Total fixed-area(F.A)birds	0	0	1	0	1	0	0	2	1	0	2	0	0	0
Area Sampled(km ²)	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Density (F.A. birds/km ²)	0	0	.98	0	.98	0	0	1.96	.98	0	1.96	0	0	0
Species	Number Observed													
Herring Gull FA													0	0
TOT													1	1
Great Black-Backed Gull FA														
TOT														
Greater Shearwater FA			1		1			2	1	0	2	0	0	
TOT			1		1			2	7	12	2	2	1	
Sooty Shearwater FA														
TOT														
UNIDENT. Storm Petrel FA														
TOT														
Wilson's Storm Petrel FA					0			0						
TOT					2			3						
Unident. Shearwater FA								0						
TOT								2						

Table 6. Summary of Transect or Station Census Data.

Observers A.F.C.

[illegible]

Table 6. Summary of Transect or Station Census Data.

Observers AFM 1

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Table 6. Summary of Transect or Station Census Data.

Observers AFM

Transect ☒ Station ☐ No.	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105
Date (GMT)	7-11	7-11	7-11	7-11	7-11	7-11	7-11	7-11	7-11	7-11	7-12	7-12	7-12	7-12	7-12
Region*	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	GB	GB	GB	GB	GB
Latitude (to nearest min.)	40-51	40-47	40-43	40-37	40-34	40-29	40-22	40-18	40-12	40-06	40-20	40-23	40-26	40-29	40-36
Longitude (to nearest min.)	69-09	69-07	69-06	69-05	69-05	69-04	69-02	69-01	69-01	69-01	68-17	68-10	68-04	68-00	68-03
Water depth (meters)	73	69	64	78	75	78	89	96	121	158	143	102	144	129	93
Total fixed-area (F.A.) birds	1	0	0	0	1	3	0	4	8	0	0	1	0	1	3
Area Sampled (km ²)	0.93	0.93	0.93	0.93	0.93	0.93	1.02	1.11	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Density (F.A. birds/km ²)	1.08	0	0	0	1.08	3.23	0	3.60	7.8	0	0	.98	0	.98	2.74
Species	Number Observed														
Herring Gull FA	1	0			0										
TOT	1	2			1										
Great Black Backed Gull FA															
TOT															
Greater Shearwater FA		0			1	2		1	2			0			3
TOT		4			3	2		1	2			1			3
Sooty Shearwater FA															
TOT															
Wilson's Storm Petrel FA						1		3	6	0		1		1	
TOT						1		3	13	6		1		2	
Unident Large Shearwater FA														0	
TOT														1	
Unident. Tern FA										0					
TOT										1					

Cruise No. 7815

Table 6. Summary of Transect or Station Census Data.

hipR/v Albatross IV.

Observers 4FM

[illegible]

Table 6. Summary of Transect or Station Census Data.

Observers AFM

[illegible]

Cruise No. 7815

Table 6. Summary of Transect or Station Census Data.

1p R/V Albatross

IV

Observers

AFM

Transect ☒ Station ☐ No.	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
Date (GMT)	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-14	7-15
Region*	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM
Latitude (to nearest min.)	43-19	43-14	43-08	43-10	43-15	43-20	43-25	43-21	43-38	43-43	43-49	43-51	43-51	43-57	43-44
Longitude (to nearest min.)	68-45	68-54	69-01	69-00	68-59	68-57	68-57	68-57	68-55	68-51	68-44	68-39	68-30	68-27	67-43
Water depth (meters)	134	145	145	165	169	123	134	145	79	95	79	80	88	88	240
Total fixed-area (F.A.) birds	11	1	1	0	2	7	356	92	19	51	26	24	6	8	13
Area Sampled (km ²)	1.02	.93	.93	1.02	1.02	1.02	.93	.93	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Density (F.A. birds/km ²)	10.8	1.08	1.08	0	1.96	6.86	382.79	98.9	18.63	50.0	25.49	23.53	5.88	7.84	12.74
Species	Number Observed														
Herring Gull FA							1	2	0	5	19	7		0	
TOT							1	5	1	12	19	10		4	
Great Black-Backed Gull FA							2	5	0	6	4	12	1	1	
TOT							2	8	3	11	10	16	5	1	
Greater Shearwater FA	1	1			1	3	2	2	0	18	3	4	4	7	2
TOT	2	2			2	3	2	4	5	22	3	4	6	10	6
Sooty Shearwater FA								3		6		1			
TOT								3		7		1			
Wilson's Storm-Petrel FA	10		1		1	4	350	80	15						8
TOT	17		1		2	4	353	104	76						16
Unidentified Large Gulls FA										0	0				0
TOT										1000	16				1
Northern Fulmar FA							1	0	0				1		2
TOT							1	1	3				1		2
Unid. Storm Petrel FA									2	2			0		
TOT									2	2			2		
Gannet FA															1
TOT															1
Common Tern FA									2						
TOT									2						
Unidentified Tern FA										13	0				
TOT										25	6				
Common Puffin FA										1					
TOT										1					

Table 6. Summary of Transect or Station Census Data.

Observers AFM

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Table 6. Summary of Transect or Station Census Data.

Observers AFM

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MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 6 - 20 July 1978

Cruise No. 7816

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Albert W. Nickerson, Staff Biologist, aboard USCGC VIGILANT from 6 - 20 July 1978. The objective of the U.S. Coast Guard Patrol was off-shore law enforcement, search and rescue. The observer was aboard the vessel on a non-interference basis primarily to collect information on the distribution and abundance of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the U.S. Coast Guard for permitting observations aboard USCGC VIGILANT. The observer thanks the Captain, CDR Ian S. Cruickshank, the officers and crew for their cooperation and assistance aboard ship. Financial support for Manomet Bird Observatory seabird studies is provided by the U.S. Department of Energy under contract number EE-78-S-02-4706.

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds

by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km^2 . A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10-minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Tables 1 - 6 summarize the relative density and relative abundance bird data, and list sightings of rare or infrequently observed bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours and Figure 2a-f indicate the distribution of five bird species per 10-minute square latitude/longitude block surveyed.

Notable during the cruise were several large aggregations of tubenoses. The largest flock was observed at $41^{\circ}38'N$, $67^{\circ}00'W$ on 8 July. At 0815 hrs., as the ship emerged from fog, very large numbers of shearwaters became visible, and during the next half hour the number of birds visible was conservatively estimated to be 100,000. A standard ten-minute watch was conducted at 0830, during which time the ship passed visible shearwaters at rates of

5 - 50 per second, at least 6000 shearwaters were observed within the fixed-area transect, and 42,000 in the total count. The composition was estimated to be 84% Greater Shearwater, 15% Sooty and 1% Manx. About 450 Wilson's Storm-Petrels were also present. Most were seen sitting on the water or flying locally. Approximately three hours later the pilot of a helicopter assigned to the ship during the cruise reported that the entire flock was 20 miles long x 4 miles wide. The center of the flock was situated at about $41^{\circ}30'N$, $67^{\circ}10'W$, and extended in a NE to SW direction.

On 12 July the pilot discovered a large, dense flock of birds that he believed to be shearwaters. This flock comprised an area approximately 1 mile long x 3.5 miles wide, and extended SE from $41^{\circ}05'N$, $69^{\circ}14'W$.

On 7 July at $41^{\circ}50'N$, $69^{\circ}34'W$, south of Platt's Bank, the ship passed a "patch" of water approximately 1 mile long x 20-40 feet wide. This water appeared smooth and glassy amidst choppy waves, giving the appearance of a slick, but no oil was visible. About 500 Wilson's Storm-Petrels were sitting on the water in the "patch," and another 1500 were seen flying in the immediate area. Unfortunately, ship's operations precluded making a surface plankton tow in the "patch."

Whales and dolphins were frequently observed and numerous during the cruise. A total of 222 individual mammals were recorded in 28 sightings. On 11 July at $40^{\circ}59'N$, $68^{\circ}58'W$ a male Finback Whale about 42 feet in length was encountered floating on the surface in a bloated but reasonably undecomposed state. A massive vertical contusion on the body suggested that the whale had been struck by a ship. On 14 July the same individual was approached again at $40^{\circ}49'N$, $68^{\circ}41'W$. At that time the body was considerably decomposed, and was being actively eaten by 20 Blue Sharks.

TABLE 1.

Seabird Density in Selected Regions Using Fixed-Area Transects

6 - 20 July 1978

<u>Region</u>	<u>Number of Transects</u>	<u>Total Km² Surveyed (TKm²)</u>	<u>Total Birds (TB)</u>	<u>Mean Density₂ (TB/TKm²)</u>	<u>Density Range (TB/Km²/Transect)</u>
Off Continen- tal Shelf	6	7.98	21	2.63	0 - 5.39
Southern New England	9	9.75	67	6.87	0 - 27.69
Georges Bank	50	45.63	7092	155.42	0 - 4418.7
Gulf of Maine	29	26.55	1370	51.60	0 - 439.2

TABLE 2.

Number of Birds Per Species in Selected Regions
(Using Fixed-Area Transects Only)

6 - 20 July 1978

<u>Species</u>	<u>Off Continental Shelf</u>	<u>Southern New England</u>	<u>Georges Bank</u>	<u>Gulf of Maine</u>
Northern Fulmar			2	
Cory's Shearwater		5	9	
Greater Shearwater		34	5723	490
Manx Shearwater			50	2
Sooty Shearwater		2	985	93
Leach's Storm-Petrel	21		1	
Wilson's Storm-Petrel		25	303	306
Great Skua			1	
Great Black-backed Gull			1	459
Herring Gull		1	16	18
Laughing Gull			1	
Unid. Tern				1

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

6 - 20 July 1978

Species	Number	Date	Location	Remarks
Manx Shearwater	3	7-7	42°24'N, 70°31'W	At sport fisherman, not feeding.
Gannet	1	7-7	42°50'N, 69°34'W	Near flock of 2000 tubenoses (sub-ad.)
Manx Shearwater	50+	7-8	41°38'N, 67°00'W	Mingled in immense flock of at least 100,000 tubenoses.
Great Skua	1	7-8	41°38'N, 67°00'W	Near above mentioned flock.
Unid. jaeger	1	7-8	41°30'N, 66°45'W	Distant.
Northern Fulmar (Lt.)	1	7-8	41°22'N, 66°29'W	Flying.
Unid. skua	1	7-9	40°55'N, 67°19'W	Heavy bill and head; solid dark brown.
Unid. tern	1	7-10	42°03'N, 69°56'W	Flying (imm.)
Unid. tern	1	7-10	42°07'N, 70°03'W	Flying (imm.)
Great Skua	1	7-11	40°42'N, 68°39'W	Flew among Greater Shearwaters.
Long-tailed Jaeger	1	7-12	41°48'N, 68°36'W	Flying (Lt. phase).
Great Skua	3	7-13	41°09'N, 67°09'W	Two paired, one alone. With tubenoses near fishing boats.
Laughing Gull	1	7-15	41°35'N, 69°41'W	Flying.
Unid. tern	4	7-15	41°35'N, 69°41'W	Flying.
Northern Fulmar	2	7-16	41°48'N, 68°12'W	On water.
Manx Shearwater	2	7-19	42°23'N, 70°20'W	Flying.
Unid. tern	1	7-19	42°06'N, 70°02'W	Flying.

TABLE 4.
List of Non-Marine Bird Sightings
6 - 20 July 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
House Finch	1	7-12	40°48'N, 68°43'W	On ship.
Mourning Dove	1	7-12	40°48'N, 68°43'W	Flying.
Least Sandpiper	1	7-17	40°58'N, 69°04'W	Flew around ship.

TABLE 5.
List of Marine Mammal Sightings
6 - 20 July 1978

Species	Number	Date	Location	Remarks
Fin Whale (prob.)	2	7-7	42°32'N, 70°27'W	Blew, arched back, sounded.
Pilot Whale	9	7-8	41°12'N, 66°05'W	Ship split pod immobile on surface.
Unid. whale	2	7-8	41°01'N, 65°30'W	Blowing, synchronous diving.
White-sided Dolphin	15	7-9	40°53'N, 67°12'W	Traveling SW.
Pilot Whale	2	7-9	40°55'N, 67°19'W	Traveling.
Common Dolphin	15	7-9	41°18'N, 68°47'W	Passing bow, traveling E.
Unid. whale	2	7-9	41°19'N, 68°59'W	Spouting.
Unid. dolphin	10	7-9	41°19'N, 68°59'W	Small, various directions.
Unid. whale	5	7-9	41°19'N, 68°53'W	Spouting.
Fin Whale (prob.)	2	7-10	42°10'N, 70°05'W	Passed bow, blew, showed back and fin.
Humpback Whale	4	7-10	42°45'N, 70°19'W	Blew, showed flukes.
Fin Whale	1	7-11	40°59'N, 68°58'W	Dead male, bloated, floating.
Pilot Whale	25	7-11	40°42'N, 68°39'W	Three pods, various directions.
Common Dolphin	20	7-11	40°47'N, 67°59'W	Various directions around ship.

TABLE 5. (continued)

Species	Number	Date	Location	Remarks
White-sided Dolphin	3	7-13	41°50'N, 68°40'W	Splashing, not traveling.
Pilot Whale	6	7-13	41°48'N, 68°36'W	Traveling south-west. Tails out.
Unid. dolphin	1	7-13	41°42'N, 68°27'W	Distant.
Unid. whale	2	7-13	41°42'N, 68°27'W	Small body and dorsal fin. Mottled gray sides.
Unid. whale	2	7-14	41°10'N, 68°46'W	Spouted, back out, large, distant.
Unid. whale	1	7-14	41°18'N, 69°09'W	Spouted.
Common Dolphin	75	7-14	41°09'N, 68°55'W	Loose pod, heading various directions.
Unid. whale	1	7-14	41°09'N, 68°55'W	Spouted.
Fin Whale	1	7-14	40°49'N, 68°41'W	Dead on surface, being eaten by 20 Blue Sharks. Same indiv. as 7-11.
Pilot Whale	4	7-16	41°21'N, 68°27'W	Surfacing.
Humpback Whale (prob.)	1	7-17	41°19'N, 69°04'W	Repeatedly breaching.
Common Dolphin	10	7-17	40°50'N, 69°04'W	Traveling west.
Fin Whale (prob.)	1	7-19	42°23'N, 70°20'W	Surfacing.
Unid. whale	1	7-19	42°21'N, 70°18'W	Spouted.

FIGURE 1. Cruise track during daylight hours, 6 - 20 July 1978.

FIGURE 2a. Distribution map of
Cory's Shearwater,
6 - 20 July 1978.

FIGURE 2b. Distribution map of
Greater Shearwater,
6 - 20 July 1978.

FIGURE 2c. Distribution map of
Sooty Shearwater,
6 - 20 July 1978.

FIGURE 2d. Distribution map of
Wilson's Storm-Petrel
6 - 20 July 1978.

FIGURE 2e. Distribution map of
Great Black-backed
Gull, 6 - 20 July
1978.

FIGURE 2f. Distribution map of
Herring Gull, 6 - 20
July 1978.

TABLE 6. Summary of Transect or Station Census Data.

ip USCGC VIGILANT Observers A. W. Nickerson

Transect ☒ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date (GMT) <u>July 1978</u>	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8
Region*	G.M.	G.M.	G.M.	G.M.	G.M.	G.M.	G.M.	G.M.	G.B.	G.B.	G.B.	G.B.	G.B.	G.B.	O.S.
Latitude (to nearest min.)	42-32	42-28	42-38	42-42	42-53	42-53	42-57	42-50	41-38	41-33	41-30	41-27	41-22	41-19	41-12
Longitude (to nearest min.)	70-27	70-26	70-26	70-23	70-22	70-13	69-44	69-34	67-00	66-52	66-45	66-37	66-29	66-21	66-05
Water depth (meters)	110	27	119	91	77	91	209	183	60	68	77	86	91	90	1509
Total fixed-area (F.A.) birds	2	5	3	0	17	6	5	202	6142	285	31	15	0	0	0
Area Sampled (km ²)	0.74	0.74	1.11	1.11	1.11	1.11	1.11	1.11	1.39	1.39	1.39	1.39	1.39	1.39	1.39
Density (F.A. birds/km ²)	2.70	6.76	2.70	0	15.32	5.41	4.51	181.98	4418.7	205.0	22.30	10.79	0	0	0
Species	Number Observed														
Greater Shearwater F.A.	0			0			0	2	5040	250	25	5	0	0	0
Tot.	2			20			7	2	35280	1750	125	21	6	5	1
Mann Shearwater F.A.									50						
Tot.									410						
oty Shearwater F.A.					1				900	30	4				
Tot.					1				6300	210	24				
Wilson's Storm-Petrel F.A.					15	4	5	200	150	5	2	10	0	0	
Tot.					60	4	12	2200	450	30	7	85	10	5	
Gannet F.A.								0							
Tot.								1							
Great Bl.-bk. Gull F.A.	1		2	0			2								
Tot.	3		2	102			6								
Herring Gull F.A.	1	5	11	0	1	0	0	0							
Tot.	2	15	3	104	1	3	1	1							
Northern Fulmar F.A.		11						2	2				0		
Tot.		1						2	2				1		
Unid. Jaeger F.A.											0				
Tot.											1				

Observers A. W. Nickerson

[illegible]

TABLE 6. Summary of Transect or Station Census Data.

Observers A. W. Nickerson

Transect ☒ Station ☐ No.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Date(GMT) July 1978	11	11	11	11	11	11	12	12	12	13	13	13	13	13	13
Region*	G.B.	G.B.	G.B.	G.B.	G.B.	G.B.	S.N.E.	S.N.E.	S.N.E.	G.M.	G.M.	G.M.	G.B.	G.B.	G.B.
Latitude(to nearest min.)	40-39	40-37	40-37	40-43	40-45	40-47	40-49	40-52	40-45	41-53	41-50	41-47	41-42	41-36	41-31
Longitude(to nearest min.)	68-33	68-27	68-20	67-56	67-57	67-59	69-43	69-44	69-34	68-45	68-40	68-34	68-27	68-18	68-11
Water depth(meters)	62	69	69	77	68	59	46	40	40	155	101	64	51	40	37
Total fixed-area(F.A.)birds	6	11	9	5	1	0	2	0	2	6	30	17	41	0	0
Area Sampled(km ²)	0.56	0.56	0.56	0.46	0.46	0.46	0.65	0.65	1.30	0.93	0.93	1.02	1.11	1.11	1.48
Density (F.A. birds/km ²)	10.71	19.64	16.07	10.87	2.17	0	3.08	0	1.54	6.45	32.26	16.67	36.94	0	0
Species	Number Observed														
Cory's Shearwater F.A.					0	0	1								
Tot.					4	1	1								
Greater Shearwater F.A.	4	7	9	5	1		1			4	15	7	25	0	0
Tot.	7	22	38	27	1		1			21	70	27	83	2	2
sooty Shearwater F.A.									2				1		
Tot.									2				1		
Wilson's Storm-Petrel F.A.	2	4								2	15	10	15		
Tot.	2	4								16	40	45	70		
Great Bl.-bk. Gull F.A.															0
Tot.															1
Herring Gull F.A.							0	0							
Tot.							1	2							

Observers A. W. Nickerson

Transect ☒ Station ☐ No.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Date(GMT) July 1978	13	13	13	13	14	14	14	14	14	14	14	14	14	14	15
Region*	G.B.	G.B.	G.B.	G.B.	G.B.	G.B.	G.M.	G.M.	G.M.	G.B.	G.B.	G.B.	G.B.	G.B.	G.B.
Latitude(to nearest min.)	41-30	41-26	41-19	41-14	41-10	41-11	41-18	41-18	41-18	40-56	40-52	40-49	40-45	40-49	41-40
Longitude(to nearest min.)	68-09	67-56	67-41	67-33	68-46	68-52	69-02	69-05	69-08	68-40	68-39	68-38	68-38	68-41	69-45
Water depth(meters)	46	27	35	44	86	99	161	101	102	68	64	49	59	69	64
Total fixed-area(F.A.)birds	0	0	0	0	3	5	0	0	0	1	0	0	1	0	1
Area Sampled(km ²)	1.11	1.21	1.30	1.21	0.74	0.74	0.83	0.37	0.87	0.74	0.74	0.74	0.74	1.11	0.65
Density (F.A. birds/km ²)	0	0	0	0	4.05	6.76	0	0	0	1.35	0	0	1.35	0	1.54
Species	None	None	None	None	None None Number Observed					None None					
Greater Shearwater F.A.					3	5								0	1
Tot.					13	40								1	12
Sooty Shearwater F.A.													1		
Tot.													1		
Wilson's Storm-Petrel F.A.						0				1					
Tot.						15				1					
Great Bl.-bk. Gull F.A.															0
Tot.															1
Herring Gull F.A.									0						0
Tot.									1						1

Observers A. W. Nickerson

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Observers A. W. Nickerson

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MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 15 - 31 July 1978

Cruise No. 7817

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by John Dugdale, Staff Intern, Manomet Bird Observatory, aboard the USSR R/V ALIOT from 16 - 31 July 1978. The objective of the cruise was to monitor changes in ichthyoplankton and their predators and prey using standard MARMAP sampling methods in Southern New England, South Coastal and Middle Atlantic waters. For four-and-a-half days the ship left its stations to meet a Soviet tanker to refuel at $40^{\circ}30'N$, $62^{\circ}02'W$, so that the observer sampled more than one-hundred transects in waters off the continental shelf. The observer was aboard on a non-interference basis primarily to collect information on the distribution and abundance of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the U.S.S.R. for permitting observations aboard the R/V ALIOT. The observer thanks the Master, Captain Leonid Sleptsoav, officers Anataliy Prokhozov, Vladimir Mukhin, and Nikolay Yakinovich, and the crew of the R/V ALIOT for their kindness and assistance on board. The observer gives special thanks to the Soviet scientific crew and to crewman Sennedy Orechkin. Finally, the Manomet Bird Observatory acknowledges the assistance of H. C. Boyar, Vessel Coordinator for the National Marine Fisheries Service, for arranging passage

aboard ship, and the Department of Energy for support (DOE Contract No. EE-78-S-02-4706).

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km^2 . A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10-minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Tables 1 - 6 summarize the relative density and abundance bird data, and list sightings of rare or infrequently observed marine bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates an incomplete cruise track during daylight hours. Figure 2a-b indicates an incomplete distribution of two bird species using the greatest total count of

each species per 10-minute square latitude/longitude block surveyed.

Greater Shearwaters were only observed in southern New England waters and waters off of the continental shelf, and no dense concentrations were recorded. Leach's Storm-Petrels also only occurred in southern New England waters and off of the continental shelf. They too were not seen in large numbers. Wilson's Storm-Petrels appeared in all four regions surveyed and the highest concentrations were off of the continental shelf; the lowest concentrations were in southern New England and south coastal areas.

The observer had few large gull sightings and all were coastal. Great Black-backed Gulls were recorded only in southern New England waters. Laughing Gull sightings were frequent in South Coastal waters. There were two separate sightings of Royal Terns in south coastal waters, both within sight of land. Common Terns were seen infrequently in south coastal waters, and in the Middle Atlantic area near shore.

There were only two sightings of Sooty Shearwaters: on July 15 two were seen SW of Block Island, and on July 19 one was seen at $40^{\circ}13'N, 63^{\circ}15'W$. Manx Shearwaters appeared regularly in the waters off of the continental shelf above $39^{\circ}N$. One unidentified small shearwater was observed at $36^{\circ}35'N, 74^{\circ}26'W$. The observer saw an unidentified skua on July 19 at $40^{\circ}13'N, 63^{\circ}15'W$.

TABLE 1.

Seabird Density in Selected Regions Using Fixed Area Transects

15 - 31 July 1978

<u>Region</u>	<u>Number of Transects</u>	<u>Total Km² Surveyed (Tkm²)</u>	<u>Total Birds (TB)</u>	<u>Mean Density₂ (TB/Tkm²)</u>	<u>Density Range (TB/Km²/Transect)</u>
Southern New England	23	19.11	64	3.35	0.00 - 34.06
South Coastal	14	11.93	15	1.26	0.00 - 5.49
Middle Atlantic	67	58.81	68	1.16	0.00 - 12.08
Off Continental Shelf	123	105.27	694	6.59	0.00 - 79.26

TABLE 2.

Number of Birds Per Species in Selected Regions Using Fixed-Area Transects

15 - 31 July 1978

<u>Species</u>	<u>Southern New England</u>	<u>South Coastal</u>	<u>Middle Atlantic</u>	<u>Off Continental Shelf</u>
Greater Shearwater	37		1	33
Sooty Shearwater	1			
Manx Shearwater				11
Unid. small shearwater				1
Leach's Storm-Petrel	6			272
Wilson's Storm-Petrel	5	2	61	377
Great Black-backed Gull	4			
Herring Gull	11		2	
Laughing Gull		11	3	
Common Tern		2	1	

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

15 - 31 July 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Sooty Shearwater	2	7-15	41°07'N, 71°23'W	Foraging
Sooty Shearwater	1	7-19	40°13'N, 63°15'W	Foraging
Manx Shearwater	1	7-16	40°36'N, 72°31'W	Foraging
Manx Shearwater	1	7-18	39°38'N, 68°31'W	Foraging
Manx Shearwater	1	7-18	39°42'N, 68°08'W	Foraging
Manx Shearwater	10	7-19	40°13'N, 63°15'W	Flushed by ship
Manx Shearwater	1	7-19	40°14'N, 63°07'W	Foraging
Manx Shearwater	1	7-19	40°15'N, 62°53'W	Flushed by ship
Manx Shearwater	1	7-20	40°01'N, 64°06'W	Flying SW
Manx Shearwater	2	7-20	39°44'N, 65°14'W	Foraging
Manx Shearwater	3	7-20	39°42'N, 65°32'W	Sitting, then flying
Manx Shearwater	2	7-21	39°31'N, 68°35'W	Foraging
Manx Shearwater	2	7-21	39°19'N, 70°31'W	Flying S
Manx Shearwater	1	7-21	39°19'N, 70°49'W	Flying E
Unid. small shear- water	1	7-26	36°35'N, 74°26'W	Flying S
Unid. skua	1	7-19	40°13'N, 63°15'W	Flying S
Common Tern	1	7-22	39°36'N, 74°04'W	Diving
Common Tern	1	7-22	39°31'N, 74°04'W	Flying W
Common Tern	3	7-25	37°48'N, 75°08'W	Diving
Common Tern	1	7-27	35°44'N, 75°07'W	Flying E

TABLE 3 (continued)

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Royal Tern	11	7-25	37°48'N, 75°08'W	Diving
Royal Tern	3	7-27	36°00'N, 75°27'W	Diving

TABLE 4.
List of Marine Mammal Sightings
15 - 31 July 1978

Species	Number	Date	Location	Remarks
Unid. small whale	1	7-16	40°32'N, 72°23'W	Diving
Unid. dolphin	1	7-21	39°29'N, 68°47'W	Swimming SE
Pilot Whale	12	7-29	39°47'N, 71°46'W	Slowly swimming
White-sided Dolphin	4	7-19	40°11'N, 63°22'W	Riding bow
White-sided Dolphin	40	7-21	39°28'N, 68°54'W	Swimming E
White-sided Dolphin	10	7-21	39°26'N, 69°48'W	Swimming alongside ship
White-sided Dolphin	2	7-21	39°19'N, 70°20'W	Swimming alongside ship
White-sided Dolphin	12	7-25	37°13'N, 74°48'W	Swimming alongside ship
Bottlenosed Dolphin	10	7-26	36°44'N, 74°20'W	Playing alongside ship
Grampus	7	7-26	36°49'N, 74°50'W	Slowly porpoising
Grampus	8	7-29	39°51'N, 71°41'W	Porpoising and tail-lobing

TABLE 5.
List of Non-Marine Bird Sightings
15 - 31 July 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Least Sandpiper	1	7-16	40°47'N, 72°40'W	On ship
Least Sandpiper	1	7-19	40°30'N, 62°02'W	On ship
Sanderling	5	7-27	35°46'N, 75°13'W	Flying S
Black-billed Cuckoo	1	7-26	36°47'N, 75°01'W	Died on ship
Belted Kingfisher	1	7-30	40°46'N, 70°00'W	Circled ship
Brown-headed Cowbird	1	7-22	39°36'N, 72°46'W	Flying SW
Red-winged Blackbird	1	7-23	38°57'N, 74°11'W	On ship for at least 2 days
Barn Swallow	1	7-23	38°44'N, 73°18'W	Following ship

FIGURE 1. Cruise track during day-light hours (incomplete), 22 - 29 July 1978.

FIGURE 2a. Distribution map of
Greater Shearwater
(incomplete), 27 - 29 July
1978.

FIGURE 2b. Distribution map of Wilson's Storm-Petrel (incomplete), 27 - 29 July 1978.

The map displays a grid with longitude labels (76, 75, 74, 73, 72) at the top and bottom, and latitude labels (40, 39, 38, 37, 36) on the left and right. The coastline of the United States is shown on the left. A 1000m depth contour is marked in the upper right. Data points are plotted as open circles and closed circles. Open circles are scattered across the grid, while closed circles are more concentrated along the coast and in the lower right quadrant, particularly between 73 and 74 longitude and 36 and 38 latitude.

TABLE 6. Summary of Transect or Station Census Data.

Ship USSR PolarObservers John D. Smith

Transect ☒ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date (GMT)	7/15	7/15	7/15	7/15	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17
Region*	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	00	00	00	00	00	00	00
Latitude (to nearest min.)	41°15'	41°15'	41°04'	41°35'	39°24'	39°20'	39°35'	39°30'	39°25'	39°25'	39°18'	39°11'	39°05'	39°05'	39°08'
Longitude (to nearest min.)	71°11'	71°22'	71°28'	71°53'	72°25'	72°05'	72°12'	72°04'	72°05'	72°05'	72°04'	72°00'	71°55'	71°51'	72°07'
Water depth (meters)	40	37	27	30	79	117	148	240	1000	1700	1200	200	200	2000	2000
Total fixed-area (F.A.) birds	6	4	5	4	31	0	2	1	5	4	17	2	2	4	4
Area Sampled (km ²)	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.82	1.12	0.52	0.43	0.82	0.52
Density (F.A. birds/km ²)	6.59	4.39	5.49	4.39	34.03	0	2.19	1.09	5.49	4.87	20.73	2.43	2.47	4.87	4.87
Species	Number Observed														
Greater Shearwater (FA)			2	1	30	0		1	0	1	1				
(Tot)			2	1	50	4		1	2	4	3				
Lesser Shearwater (FA)		1													
(Tot)		1													
Great Black-Backed Gull (FA)	2	1	1												
(Tot)	2	1	2												
Herring Gull (FA)	4	2	2	3											
(Tot)	4	2	2	3											
Wilson's Storm-Petrel (FA)					1	0	2	0	5	3	16	2	2	4	4
(Tot)					2	1	2	8	7	6	18	14	10	4	4

TABLE 6. Summary of Transect or Station Census Data.

Ship USSR 2102Observers John Duglish

Transect ☒ Station ☐ No.															
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Date (GMT)	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17	7/17
Region*	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Latitude (to nearest min.)	39°32'	39°11'	39°02'	38°52'	38°45'	38°37'	38°27'	38°17'	38°07'	37°57'	37°47'	37°37'	37°27'	37°17'	37°07'
Longitude (to nearest min.)	72°02'	72°13'	72°23'	72°32'	72°42'	72°52'	73°02'	73°12'	73°22'	73°32'	73°42'	73°52'	74°02'	74°12'	74°22'
Water depth (meters)	1228	900	1100	1500	2200	2700	3000	3300	3600	3900	4200	4500	4800	5100	5400
Total fixed-area (F.A.) birds	4	2	18	5	1	1	2	4	3	2	3	3	7	8	1
Area Sampled (km ²)	0.82	0.62	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Density (F.A. birds/km ²)	2.67	2.43	19.78	5.49	1.09	1.09	2.19	4.39	3.39	2.19	3.29	3.29	7.69	8.69	1.09
Species	Number Observed														
Greater Shearwater (FA)						1		1			1	1	1	4	
(Tot)						1		1			1	1	1	4	
Wilson's Storm Petrel (FA)	4	2	18	5	1										
(Tot)	4	2	18	17	7										
Leach's Storm Petrel (FA)						1	2	3	3	2	2	2	4	4	1
(Tot)						1	4	3	3	4	3	2	4	4	1

TABLE 6. Summary of Transect or Station Census Data.

Ship USCGC SpencerObservers James D. Smith

Transect ☒ Station ☐ No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Date (GMT)	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3	7/3
Region*	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Latitude (to nearest min.)	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157
Longitude (to nearest min.)	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155
Water depth (meters)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Total fixed-area (F.A.) birds	1	1	5	2	2	5	7	5	10	1	0	3	2	1	1
Area Sampled (km ²)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Density (F.A. birds/km ²)	10.0	10.0	50.0	20.0	20.0	50.0	70.0	50.0	100.0	10.0	0.0	30.0	20.0	10.0	10.0
Species	Number Observed														
Greater Shearwater (FA)				1				1							
(tot)				1				1							
Manx Shearwater (FA)														1	
(tot)														1	
Leach's Storm-Petrel (FA)	1	20	5	8	2	5	7	7	10	7		3	2	9	1
(tot)	1	20	5	8	2	5	7	7	10	7		3	2	9	1

TABLE 6. Summary of Transect or Station Census Data.

hip 4512 E

Observers Jim Jones

Transect ☒ Station ☐ No.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Date (GMT)	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27	7-27
Region*	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Latitude (to nearest min.)	39°17'	39°17'	39°17'	39°17'	39°17'	40°25'	40°02'	39°31'	39°55'	39°55'	39°55'	39°55'	39°55'	39°55'	39°55'
Longitude (to nearest min.)	122°07'	122°07'	122°07'	122°07'	122°07'	121°16'	121°02'	120°55'	120°20'	120°25'	120°30'	120°36'	120°42'	120°48'	120°52'
Water depth (meters)	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Total fixed-area (F.A.) birds	2	2	2	2	2	15	17	3	5	11	8	17	2	2	2
Area Sampled (km ²)	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Density (F.A. birds/km ²)	2.73	2.73	2.73	2.73	2.73	20.54	23.28	4.10	6.84	15.06	10.45	23.28	2.73	2.73	2.73
Species	Number Observed														
Greater Shearwater (FA)				1						1			1	2	
(Tot)				1						1			1	2	
Mauk Shearwater (FA)							1								
(Tot)							1								
Leach's Storm-Petrel (FA)	2			2		1	15	16	3	5	10	8	17	1	
(Tot)	2			2		1	15	16	3	5	10	8	17	1	

TABLE 6. Summary of Transect or Station Census Data.

ip USSR Fleet

Observers

John D. 196

Transect ☒ Station ☐ No.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Date (GMT)	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20	7/20
Region*	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Latitude (to nearest min.)	39°48'	39°48'	39°44'	39°42'	39°42'	39°42'	39°42'	39°42'	39°42'	39°42'	39°42'	39°42'	39°42'	39°42'	39°42'
Longitude (to nearest min.)	65°59'	65°56'	65°54'	65°52'	65°52'	65°52'	65°52'	65°52'	65°52'	65°52'	65°52'	65°52'	65°52'	65°52'	65°52'
Water depth (meters)	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Total fixed-area (F.A.) birds	2	5	7	2	0	2	3	1	1	4	2	16	0	2	2
Area Sampled (km ²)	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Density (F.A. birds/km ²)	2.73	6.84	10.05	2.73	0	2.73	4.10	1.36	1.36	5.47	2.73	21.91	0	6.84	0
Species	Number Observed														
Greater Shearwater (FA)	1	1	1					1	1	1				2	
(Tot)	1	1	1					1	1	1				2	
Manx Shearwater (FA)			2				3							2	
(Tot)			2				3							2	
Leach's Storm-Petrel (FA)	1	4	5	2		2				3	2	16		1	
(Tot)	1	4	5	2		2				3	2	16		1	

(6)

(6)

Observers

Transect ☒ Station ☐ No.																	
Date (GMT)	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
Region*	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Latitude (to nearest min.)	29°29'	29°25'	29°20'	29°15'	29°10'	29°05'	29°00'	28°55'	28°50'	28°45'	28°40'	28°35'	28°30'	28°25'	28°20'	28°15'	28°10'
Longitude (to nearest min.)	155°00'	155°05'	155°10'	155°15'	155°20'	155°25'	155°30'	155°35'	155°40'	155°45'	155°50'	155°55'	156°00'	156°05'	156°10'	156°15'	156°20'
Water depth (meters)	2500	2500	2500	2500	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
Total fixed-area (F.A.) birds	0	1	3	4	3	4	0	4	0	5	3	2	0	0	0	0	0
Area Sampled (km ²)	0.01	0.01	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Density (F.A. birds/km ²)	0.00	1.00	3.29	4.30	3.29	4.30	0.00	4.30	0.00	5.40	3.20	2.10	0.00	0.00	0.00	0.00	0.00
Species	Number Observed																
Greater Shearwater (FA)								3				1	1				
(tot)								3				1	1				
Leach's Storm-Petrel (FA)	2	1	3	4	3	4		1		5	3	1	6				
(Tot)	2	1	3	4	3	4		1		5	3	1	6				

TABLE 6. Summary of Transect or Station Census Data.

1p

Observers

Transect ☐ Station ☒ No.																
Date (GMT)	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1	7-1
Region*	22	22	22	22	22	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE	S.NE
Latitude (to nearest min.)	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Longitude (to nearest min.)	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73
Water depth (meters)	200	200	200	200	200	72	65	15	15	15	15	15	15	15	15	15
Total fixed-area (F.A.) birds	7	0	4	3	6			0	1	0						
Area Sampled (km ²)	0.2	0.2	0.2	0.2	0.2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Density (F.A. birds/km ²)	7.5	0	4.3	3.2	6.5			0		0						
Species	Number Observed															
Greater Shearwater (FA)	1				2			1								
(Tot)	1				2			1								
Mauv Shearwater (FA)	2															
(Tot)	2															
Leach's Storm-Petrel (FA)	5		4	3	4	1				1						
(Tot)	5		4	3	4	1				1						

TABLE 6. Summary of Transect or Station Census Data.

11p

Observers Sh. D. '4

Transect ☒ Station ☐ No.																	
Date (GMT)	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22	7/22
Region*	SIVE	MA	MA	MA	MA	MA	MA	SC	SC	SC	SC	SC	OD	OD	OD	MP	MP
Latitude (to nearest min.)	34°	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'	34°30'
Longitude (to nearest min.)	72°	72°	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'	72°30'
Water depth (meters)	35	32	36	30	62	25	22	18	15	20	18	15	15	15	15	15	15
Total fixed-area (F.A.) birds	2	0	0	0	1	1	2	0	1	0	5	0	0	0	0	0	0
Area Sampled (km ²)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Density (F.A. birds/km ²)	0	0	0	0	1.00	1.00	2.00	0	1.00	0	5.00	0	0	0	0	0	0
Species	Number Observed																
Greater Shearwater (FA)																1	
(Tot)																1	
Wilson's Storm-Petrel (FA)					1								5				1
(Tot)					1								5				1
Laughing Gull (FA)						1	1	2	0	0							
(Tot)						1	1	6	1	1							
Common Tern (FA)										1							
(Tot)										1							

1p 58 2 2 Observers 58 2 2

[illegible]

(13)

Observers

[illegible]

(11)

(11)

Observers J. J. J.

[illegible]

(2)

Observers J.L.

Transect ☒ Station ☐ No.	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Date (GMT)	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28	7/28
Region*	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA
Latitude (to nearest min.)	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°
Longitude (to nearest min.)	74°	74°	74°	74°	74°	74°	74°	74°	74°	74°	74°	74°	74°	74°	74°
Water depth (meters)	24	25	30	53	57	51	51	50	57	77	42	36	21	24	12
Total fixed-area (F.A.) birds	0	0	0	0	0	0	0	0	0	0	4	5	0	5	0
Area Sampled (km ²)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Density (F.A. birds/km ²)	0	0	0	0	0	0	0	0	0	0	40	43	0	50	0
Species	Number Observed														
Wilson's Storm Petrel (FA)					0		7	0	1	4			1	5	1
(Tot)					1		7	3	11	11			1	5	1

1131

Observers

1131

(14)

(14)

Observers

John Doyle

[illegible]

TABLE 6. Summary of Transect or Station Census Data.

Ship USSR AlbatObservers John Dwyer

Transect ☒ Station ☐ No.															
	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
Date (GMT)	7/28	7/28	7/28	7/28	7/28	7/28	7/29	7/29	7/29	7/29	7/29	7/29	7/29	7/29	7/29
Region*	00	00	00	00	00	00	00	00	00	00	00	00	00	S.NE	S.NE
Latitude (to nearest min.)	37°56'	38°04'	38°08'	38°12'	38°20'	38°24'	39°30'	39°34'	39°37'	39°41'	39°45'	39°51'	39°54'	39°57'	40°00'
Longitude (to nearest min.)	72°45'	72°42'	72°41'	72°40'	72°36'	72°35'	72°01'	71°58'	71°54'	71°50'	71°46'	71°41'	71°42'	71°42'	71°46'
Water depth (meters)	2500	2700	2800	2800	2800	2700	660	480	620	440	650	400	440	103	27
Total fixed-area (F.A.) birds	17	10	0	2	1	5	7	38	2	65	40	5	1	2	0
Area Sampled (km ²)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.73	0.82
Density (F.A. birds/km ²)	20.73	12.19	0	2.43	1.21	6.09	8.54	46.34	2.43	79.26	48.78	6.09	1.21	2.73	0
Species	Number Observed														
Wilson's Storm-Petrel (FA)	17	10	0	2	1	5	7	38	2	65	40	5	1	2	
(Tot)	17	15	2	2	3	5	7	38	4	65	40	5	2	2	

(16)

(16)

W. R. A. 105

22-2-21

[illegible]

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 17 - 29 July 1978

Cruise No. 7818

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Kevin D. Powers, Staff Biologist, aboard the C.C.G.S. NARWHAL from 17 - 29 July 1978. The objectives of the cruise were to transport hydrographic equipment and crew to Baker Lake, N.W.T. and to conduct hydrographic work in Hudson Bay during the ice-free season. The observer was aboard the vessel on a non-interference basis primarily to collect information on distribution and abundance of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the Canadian Coast Guard for permitting observations aboard the C.C.G.S. NARWHAL. The observer thanks the Master, Captain C. Green, officers, and crew of the C.C.G.S. NARWHAL, in addition to E. Thompson and R. Langsford, Hydrographer and Asst. Hydrographer-in-charge, respectively. Finally, acknowledgement is extended to Dr. R.G.B. Brown, Research Ornithologist for the Canadian Wildlife Service (CWS), for arranging passage aboard ship, and CWS and U.S. Department of Energy for travel expenses and support (DOE Contract No. EE-78-S-02-4706).

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data

were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km^2 . A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10 minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Tables 1 - 5 summarize relative density and relative abundance bird data, and list sightings of rare or infrequently observed coastal and marine bird species, and marine mammals. Figure 1 - 2 graphically illustrate the approximate cruise track.

The cruise provided a unique opportunity to determine mid-summer distribution ranges of breeding and nonbreeding marine birds from Atlantic Canada to Hudson Bay, and provide information on probable foraging ranges of murres and puffins. The changes in species composition and abundance were often quite distinct from day to day or region to region, as the ship steamed N from the Scotian Shelf to Resolution Island and W across the Hudson Strait and Hudson Bay.

Although fulmars, shearwaters, storm-petrels and gulls were recorded from Halifax to the southern end of the Strait of Belle Isle, bird density was considerably lowest in Cabot Strait and NE Gulf of St. Lawrence. Greater Shearwater was the most abundant species on the Scotian Shelf; fulmars, Herring Gulls, and Kittiwakes were most abundant near the Strait of Belle Isle. Herring Gulls and Kittiwakes were observed moving N toward the Strait of Belle Isle (N of 49° N latitude) and fulmars appeared to do the same, but at $50^{\circ}17'N$, $58^{\circ}04'W$ a side trawler with 1200-1500 birds ship-following was passed. Herring Gull and kittiwake abundance decreased N of the fishing vessel, and fulmar numbers increased. In the southern part of the Strait of Belle Isle flocks of 25-50 fulmars sitting were common and most birds were unable to fly when approached by the oncoming vessel. Glacial icebergs, which were observed in the Strait of Belle Isle and along the Labrador coast usually had flocks of kittiwakes sitting on or flying about them.

North of the Strait of Belle Isle to Resolution Island and the eastern entrance of Hudson Strait, fulmars were the most abundant species. Fulmars were almost never out of sight of the ship along the Labrador coast. Common Murres and puffins were recorded from the Strait of Belle Isle to Hamilton Inlet. Although some of these alcids were observed sitting, most birds were apparently traveling to and from the large breeding colonies S of Hamilton Inlet. Neither murres or puffins were observed to be carrying fish. Greater and Sooty Shearwaters again became common along the SE Labrador coast, but their abundance steadily dwindled to nil as the ship reached Hudson Strait.

An abrupt change in species composition and abundance was observed at Hudson's Strait. Fulmar numbers rapidly decreased, while Thick-billed Murre density increased. Although not all murres were identified to species N of

Hamilton Inlet, each identification to species was Thick-billed. Thick-billed Murre density peaked in Hudson Strait from $61^{\circ}53'N$, $68^{\circ}14'W$, west to $62^{\circ}00'N$, $68^{\circ}46'W$. This area was within 15 nm of Baffin Island, ca. 90 nm N of Akpatok I., and ca. 90 nm W of Hantzsch I. The vast majority of these murres were sitting and although none were observed feeding, many appeared gluttoned with food.

Another comparable Thick-billed Murre density was recorded nearshore on the northern coast of Salisbury I. from $63^{\circ}50'N$, $76^{\circ}39'W$ to $63^{\circ}49'N$, $76^{\circ}58'W$. The coastline appeared to have ideal murre nesting habitat, high precipitous cliffs with no land predator accesses. The possibility of an unchartered colony may exist there, but 6/10's cover open pack ice covered waters from Salisbury and Nottingham Islands S to Digges and Coats Islands, where enormous murre colonies exist. These birds may have been forced to feed further N.

Flocks of Red Phalaropes and individuals and small groups of Long-tailed Jaegers were intermittent but regular throughout Hudson Strait. All Red Phalaropes were in full alternate plumage. Most Long-tailed Jaegers appeared to be associated with "strings" of drifted pack ice.

A final change in abundance occurred W of Fisher Strait or the waters of Hudson Bay. This area had a paucity of avifauna and "no bird" 10-minute counts were common. The most frequently sighted species in this area were Long-tailed Jaegers, Herring Gulls, Thick-billed Murres, and Black Guillemots.

One final note is made to several sightings of "portlandica" Arctic Terns along the Labrador coast on 20 and 21 July. These birds had white bars across the forehead, entire black bills, sooty black crowns, no distinguishable dark areas along the carpals, uniformly light gray backs, white underparts, and forked tails.

FIGURE 1. Approximate cruise in Atlantic Canada,
17 - 20 July 1978.

FIGURE 2. Approximate cruise track in eastern Canadian Arctic and Hudson Bay, 20 - 29 July 1978.

TABLE 1.

Seabird Density in Selected Regions Using Fixed-Area Transects

17 - 29 July 1978

Region	Number of Transects	Total Km ² Surveyed (Tkm ²)	Total Birds (TB)	Mean Density ₂ (TB/Tkm ²)	Density Range (TB/Km ² / Transect)
Atlantic Canada (to 58° N latitude)	77	69.63	1557	22.36	0 - 178.49
Eastern Canadian Arctic (58° N latitude to Fisher Strait)	157	148.05	2381	16.02	0 - 272.04
Hudson's Bay (W of Fisher Strait)	33	32.88	46	1.40	0 - 5.38

TABLE 2.

Number of Birds Per Species in Selected Regions

(Using Fixed-Area Transects Only)

17 - 29 July 1978

<u>Species</u>	<u>Atlantic Canada</u>	<u>Eastern Cana- dian Arctic</u>	<u>Hudson's Bay</u>
Northern Fulmar	783	586	
Greater Shearwater	209	4	
Sooty Shearwater	59	3	
Manx Shearwater	2		
Leach's Storm-Petrel	17		
Gannet	5	2	
Red Phalarope	3	453	
Pomarine Jaeger		1	
Long-tailed Jaeger		40	1
Glaucous Gull		1	
Iceland/Kumlien's Gull		11	
Great Black-backed Gull	56		
Lesser Black-backed Gull		1	
Herring Gull	136		6
Herring/Thayer's Gull		8	1
Unid. large gull			1
Black-legged Kittiwake	222	40	
Arctic Tern	3	43	4
Unid. tern		2	
Common Murre	11		
Thick-billed Murre	1	572	24
Unid. Murre	13	568	
Black Guillemot	5	46	9
Common Puffin	33		

TABLE 3.

List of Rare or Infrequent Bird Sightings

17 - 29 July 1978

Species	Number	Date	Location	Remarks
Manx Shearwater	1	7-18	46°40'N, 59°30'W	
Manx Shearwater	1	7-18	47°40'N, 59°34'W	
Manx Shearwater	1	7-18	47°46'N, 59°34'W	
Wilson's Storm-Petrel	2	7-17	44°48'N, 62°03'W	
Wilson's Storm-Petrel	3	7-19	50°15'N, 58°06'W	
Northern Phalarope	5	7-28	62°32'N, 89°12'W	Alternate plumage
Pomarine Jaeger	1	7-20	53°01'N, 55°26'W	Adult, light phase
Pomarine Jaeger	1	7-21	57°01'N, 59°08'W	Adult, light phase
Pomarine Jaeger	1	7-21	57°33'N, 59°44'W	Adult, dark phase
Pomarine Jaeger	1	7-23	62°13'N, 69°38'W	Adult, light phase
Pomarine Jaeger	1	7-29	Churchill R. Inlet	Adult, light phase
Parasitic Jaeger	1	7-20	54°25'N, 56°24'W	Dark phase, harassing BLKI
Parasitic Jaeger	1	7-25	63°39'N, 83°38'W	Adult, light phase
Glaucous Gull	1	7-24	63°49'N, 77°02'W	Adult
Lesser Black-backed Gull	1	7-21	57°11'N, 59°20'W	Adult, <i>L. f. graellsii</i>
Sabine's Gull	2	7-25	63°39'N, 83°07'W	Adults

TABLE 4.

List of Marine Mammal Sightings

17 - 29 July 1978

Species	Number	Date	Location	Remarks
Pilot Whales	5-8	7/17	44°40'N, 62°32'W	One calf.
White-sided Dolphins	3-4	7/18	46°38'N, 59°30'W	Porpoising near fishing vessel.
Probable Pilot Whale	1	7/19	50°11'N, 58°09'W	Surfaced, exposed fin only.
Probable Finback	1	7/20	52°40'N, 55°24'W	
Unid. porqual	1	7/20	52°57'N, 55°26'W	
Unid. porqual	1	7/20	53°13'N, 55°27'W	
Probable Finback	1	7/20	53°18'N, 55°27'W	
White-beaked Dolphins	2	7/20	54°21'N, 56°20'W	Rode bow wave.
Beluga	1	7/28	62°36'N, 89°07'W	Stationary at surface; with a HEGU sitting on its back.
Beluga	10-15	7/29	Churchill R. Inlet	
Walrus	100-150	7/24-25	Herds assoc. with open pack ice along southern tip of Bell Peninsula (Southampton I) in Evans Strait.	
Unid. Seals	14 total	7/24-26, 28	Individuals scattered usually on the edges of "fields" of open pack ice, rarely hauled out.	

Cruise No. 7818

TABLE 5. Summary of Transect or Station Census Data.

Ship C.C.G.S. NARWHAL

Observers KDP

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Cruise No. 7818

TABLE 5. Summary of Transect or Station Census Data.

1p C.C.G.S. NARWHAL

Observers KDP

Transect ☒ Station ☐ No.		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Date (GMT)	July	18	18	18	18	18	18	18	18	18	18	18	18	18	19	19
Region*																
Latitude (to nearest min.)		46-40	46-59	47-03	47-08	47-13	47-18	47-22	47-27	47-37	47-41	47-46	47-51	48-00	49-45	49-48
Longitude (to nearest min.)		59-30	59-32	59-33	59-32	59-33	59-33	59-33	59-34	59-34	59-34	59-34	59-34	59-32	58-30	58-27
Water depth (meters)		392	376	390	259	381	345	345	345	350	350	337	250	194	125	140
Total F.A. birds		2	2	1	1	2	1	1	2	49	1	6	1	2	63	41
Area Sampled (km ²)		0.84	0.93	0.93	0.84	0.93	1.02	0.84	1.02	0.93	0.93	1.02	0.93	0.93	0.93	0.93
Density (Birds/km ²)		2.38	2.15	1.08	1.19	2.15	0.98	1.19	1.96	52.69	1.08	5.88	1.05	2.15	67.74	44.09
Species		Number Observed														
Northern Fulmar	F.A.			1		1	1	0		3	0	2	1			4
	Tot.			1		1	1	1		4	2	4	1			4
Greater Shearwater	F.A.	1							1	46	0	1	0	1		
	Tot.	4							2	47	1	7	1	1		
Sooty Shearwater	F.A.								1		1					1
	Tot.								1		2					1
Leach's Storm-Petrel	F.A.			0	1	1		1	0			1				
	Tot.			1	2	1		1	1			1				
Gannet	F.A.											1				
	Tot.											1				
Manx Shearwater	F.A.	1										1				
	Tot.	1										1				
Great Blk-backed Gull	F.A.			0	0	0	0		0						3	2
	Tot.			1	1	1	1		1						5	3
Herring Gull	F.A.		2												21	15
	Tot.		3												33	15
Blk-legged Kittiwake	F.A.								0			0		1	39	19
	Tot.								1			1		1	39	19

TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

Transect ☒ Station ☐ No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Date (GMT) July	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Region*															
Latitude (to nearest min.)	49-52	49-57	50-01	50-06	50-11	50-15	50-20	50-23	50-32	50-38	50-43	50-48	50-51	51-00	51-03
Longitude (to nearest min.)	58-22	58-18	58-15	58-12	58-09	58-06	58-02	57-29	57-53	57-48	57-44	57-40	57-38	57-31	57-28
Water depth (meters)	144	143	173	223	251	258	256	257	254	179	110	71	57	76	90
Total F.A. Birds	33	25	31	35	20	54	27	23	11	15	10	2	1	2	20
Area Sampled (km ²)	0.93	0.93	0.93	0.93	0.93	0.93	0.75	0.75	0.93	0.93	0.93	0.84	0.84	0.84	0.84
Density (Birds/km ²)	35.48	26.88	33.33	37.63	21.51	58.06	36.00	30.67	11.83	16.13	10.75	2.38	1.19	2.38	23.81
Species	Number Observed														
Northern Fulmar F.A.	1	5	1	2		2	5	5	3	9	4	1		2	12
Tot.	2	5	1	2		2	5	10	6	9	4	1		3	27
Greater Shearwater F.A.					1	1			1	1					2
Tot.					1	1			1	1					2
Sooty Shearwater F.A.						1	3	1	1				1		1
Tot.						1	3	1	2				1		1
Leach's Storm-Petrel F.A.				1	3	3									2
Tot.				1	5	3									5
Wilson's Storm-Petrel F.A.						0									
Tot.						1									
Great Blk.-backed Gull F.A.	2	1	1	4	10	11		1	1	1					
Tot.	2	1	1	4	10	11		1	2	4					
Herring Gull F.A.	11	5	17	21	6	14	1	10	2	1	2	0	0	0	
Tot.	13	15	58	22	9	15	1	10	4	1	2	1	1	2	
Blk.-legged Kittiwake F.A.	18	13	12	7	0	22	18	6	2	3	4	1	0		3
Tot.	19	13	43	9	7	22	18	7	3	3	6	2	3		3
Arctic Tern F.A.		1													
Tot.		1													
Common Murre F.A.	1								1						
Tot.	1								1						
Unid. large gull F.A.												0			
Tot.												3			
id. alcid F.A.												0			
Tot.												1			

TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

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TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

Transect ☒ Station ☐ No.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Date(GMT) July	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Region*															
Latitude(to nearest min.)	53-08	53-13	53-18	53-22	53-32	53-37	53-41	53-45	53-58	54-02	54-06	54-11	54-21	54-25	54-30
Longitude(to nearest min.)	55-26	55-27	55-27	55-28	55-33	55-38	55-42	55-46	55-58	56-01	56-06	56-10	56-20	56-24	56-28
Water depth(meters)	178	152	149	138	118	126	126	131	159	178	271	157	146	140	165
Total F.A. Birds	26	31	25	23	24	7	19	14	9	23	17	18	6	9	3
Area Sampled(km ²)	0.93	0.93	0.84	0.84	0.84	0.93	0.93	1.02	0.93	0.93	0.93	1.02	0.84	0.84	0.93
Density (Birds/km ²)	27.96	33.33	29.76	27.38	28.57	7.53	20.43	13.73	9.68	24.73	18.28	17.65	7.14	10.71	3.23
Species	Number Observed														
Northern Fulmar F.A.	20	16	17	8	19	3	8	8	4	9	14	9	3	7	0
Tot.	29	20	23	17	34	4	13	8	4	16	20	10	3	9	1
Greater Shearwater F.A.	3	4	5	8	0		4	2	2	0	0	2	2		
Tot.	6	11	8	11	1		4	10	2	1	1	3	2		
Sooty Shearwater F.A.	1	1	0	6	1		3	1	1		2	2			
Tot.	2	1	1	10	3		4	1	2		2	2			
Gannet F.A.				0	0	0					0				0
Tot.				1	2	1					1				1
Blk.-legged Kittiwake F.A.		4									0			0	
Tot.		4									1			27	
Common Murre F.A.			2		1	4		1		1					
Tot.			2		1	4		1		1					
Thick-billed Murre F.A.		1													
Tot.		1													
Unid. murre F.A.	0	2		1	0			2	2			1	1		
Tot.	1	6		4	1			2	3			1	1		
Black Guillemot F.A.	2				2										1
Tot.	2				2										1
Common Puffin F.A.	0	3	1		1		4			13	1	4		2	2
Tot.	2	3	1		1		4			13	2	4		2	2

TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

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Cruise No. 7818

TABLE 5. Summary of Transect or Station Census Data.

Chap C.C.G.S. NARWHAL

Observers KDP

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TABLE 5. Summary of Transect or Station Census Data.

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Cruise No. 7818

TABLE 5. Summary of Transect or Station Census Data.

Ship C.C.G.S. NARWHAL

Observers KDP

[illegible]

TABLE 5. Summary of Transect or Station Census Data.

1p C.C.G.S. NARWHAL

Observers KDP

Transect ☒ Station ☐ No.	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Date(GMT) July	23	23	24	24	24	24	24	24	24	24	24	24	24	24	24
Region*															
Latitude(to nearest min.)	63-05	63-05	63-49	63-50	63-50	63-50	63-50	63-50	63-50	63-50	63-50	63-50	63-50	63-50	63-49
Longitude(to nearest min.)	72-30	72-32	75-30	75-36	75-48	75-51	75-55	75-59	76-02	76-08	76-11	76-39	76-46	76-52	76-58
Water depth(meters)	271	271	241	242	237	237	237	238	245	255	264	388	389	390	389
Total F.A. Birds	17	28	8	2	2	23	6	2	3	0	6	15	63	34	27
Area Sampled(km ²)	0.93	0.93	1.02	1.02	0.93	0.93	0.93	0.93	0.93	0.93	0.84	0.84	0.84	0.84	0.84
Density (Birds / km ²)	18.28	30.11	7.84	1.96	2.15	24.73	6.45	2.15	3.23	0	7.14	17.86	75.00	40.48	32.14
Species	Number Observed														
Northern Fulmar F.A.									1						
Tot.									1						
Red Phalarope F.A.						5					3				
Tot.						5					3				
Long-tailed Jaeger F.A.		4									1		0		
Tot.		4									1		2		
Thick-billed Murre F.A.															
Tot.															
Unid. murre F.A.															
Tot.															
Black Guillemot F.A.				1		10						3	1	1	2
Tot.				1		12						3	1	1	2

TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

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TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

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TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

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TABLE 5. Summary of Transect or Station Census Data.

Observers KDP

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MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 14 - 28 August 1978

Cruise No. 7819

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Kevin D. Powers, Staff Biologist, aboard the USSR R/V ALIOT from 14 - 28 August 1978. The objectives of the cruise were to collect marine birds for food habits analysis and physiological, anatomical and systematical studies; and conduct transect censuses of marine birds to continue monitoring seasonal changes in distribution and abundance on shelf and slope areas of Georges Bank and contiguous waters.

The Manomet Bird Observatory gratefully acknowledges the cooperation of AtlantNIRO, Kaliningrad, USSR; NMFS; and Peabody Museum at Yale University for their respective roles in making this cruise successful. The USSR provided the R/V ALIOT officers, crew, scientists, and equipment for a dedicated marine ornithology cruise. The NMFS provided logistical support (i.e. 16 ft. whaler and neuston tow), an interpreter, and all cruise arrangements. The Peabody Museum provided manpower, laboratory and collecting equipment, and permit needs for specimen collection. Special thanks are extended to the Master, Captain Leonid Sleptsoav, officers, crew, and scientists, particularly Leonid Bugaev, of the R/V ALIOT; Dr. Robert L. Edwards, Director NEFC, H.C. Boyar, Vessel Coordinator, and Deborah Dwyer, Interpreter, of the NMFS;

and Dr. Fred C. Sibley, Senior Museum Preparator, Peabody Museum. The author also thanks the Department of Energy for support (DOE Contract No. EE-78-S-02-4706).

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km². A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10-minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Tables 1 - 7 summarize the relative density and abundance bird data, and list bird specimens collected, sightings of rare or infrequently observed marine bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours. Figures 2a-g

graphically indicates the distribution of seven bird species using the greatest total count of each species per 10-minute square latitude/longitude block surveyed.

Wilson's Storm-Petrels were the most abundant and widespread species. Flocks and feeding assemblages of 50-200 Wilson's were recorded along the southern edge of the continental shelf, Great South Channel and deep waters to its north in the Gulf of Maine, and deep waters northeast of Provincetown and Cashes Ledge. A large concentration of Wilson's, Greater, Sooty and probably Manx Shearwaters was recorded in the Great South Channel (ca. $41^{\circ}11'N$, $69^{\circ}05'W$). Cory's Shearwaters were only found in significant numbers in an area southeast of Nantucket Shoals in the Great South Channel, where they were feeding on Atlantic Saury (*Scomberesox saurus*).

Four positive and three probable sightings totaling 7 Audubon's Shearwaters were recorded in the Southern New England area, and 19 sightings totaling 25 Pomarine Jaegers were recorded throughout the entire area surveyed. Two sightings of Great Skuas and one unidentified skua were made.

Four sightings, including two immatures, of Black-legged Kittiwakes were recorded in the Gulf of Maine. One possible sighting of an adult Lesser Black-backed Gull was made in the Gulf of Maine, but identification is based only on size and mantle color. No soft parts were seen.

TABLE 1.

Seabird densities in selected regions using fixed-area transects

14 - 28 August 1978

<u>Region</u>	<u>Number of Transects</u>	<u>Total Km² Surveyed (Tkm²)</u>	<u>Total Birds (TB)</u>	<u>Mean Density (TB/Tkm²)</u>	<u>Density Range (TB/km²/Transect)</u>
Georges Bank	81	75.20	1430	19.02	0 - 235.14
Gulf of Maine	74	72.51	1514	20.88	0.98 - 153.92
Southern New England	75	69.64	663	9.52	0 - 84.95
South Coastal	2	1.77	6	3.39	1.19 - 5.38
Off Continental Shelf	6	5.49	283	51.55	7.53 - 123.53

TABLE 2.

Number of Birds Per Species In Selected Regions Using Fixed-Area Transects

14 - 28 August 1978

<u>Species</u>	<u>Georges Bank</u>	<u>Gulf of Maine</u>	<u>Southern New England</u>	<u>South Coastal</u>	<u>Off Continental Shelf</u>
Cory's Shearwater	23		97		1
Greater Shearwater	639	235	272		3
Sooty Shearwater	13	2	5		
Manx Shearwater	2				
Audubon's Shearwater			4		
Leach's Storm-Petrel	6	7	1		7
Wilson's Storm-Petrel	579	1011	222	6	272
Unid. storm-petrel		2			
Red Phalarope			25		
Northern Phalarope			2		
Unid. phalarope			5		
Pomarine Jaeger	1	2	4		
Great Skua	1		1		
Great Black-backed Gull	123	141	13		
Herring Gull	40	109	5		
Black-legged Kittiwake		1			
Arctic Tern	1		7		
Unid. tern	2	4			

TABLE 3.

List of rare or infrequent coastal and marine bird sightings

14 - 28 August 1978

Species	Number	Date	Location	Remarks
Audubon's Shearwater	2	8-16	40°42'N, 70°04'W	
Aububon's Shearwater (prob.)	1	8-16	40°31'N, 70°00'W	
Audubon's Shearwater	1	8-16	40°23'N, 70°00'W	
Audubon's Shearwater	1	8-16	40°08'N, 70°00'W	
Audubon's Shearwater (prob.)	1	8-16	40°00'N, 69°39'W	
Audubon's Shearwater (prob.)	1	8-18	40°39'N, 68°30'W	
Audubon's Shearwater	2	8-18	40°40'N, 68°30'W	
Manx Shearwater	1	8-25	41°15'N, 68°35'W	
Manx Shearwater	1	8-25	41°07'N, 69°05'W	
Manx Shearwater	1	8-25	41°10'N, 69°07'W	
Manx Shearwater	2			
Double-crested Cormorants	21	8-24	43°00'N, 68°01'W	Traveling NW.
Gannet	1	8-24	42°50'N, 68°00'W	Subadult.
Red Phalarope	25	8-16	40°00'N, 69°43'W	Traveling S.
	2	8-23	42°30'N, 69°07'W	Traveling W.
Northern Phalarope	2	8-26	40°53'N, 69°29'W	
Unid. phalaropes	16	8-15	40°00'N, 70°30'W	Traveling S.
	5	8-17	40°12'N, 69°27'W	Traveling SSE.
	1	8-27	40°30'N, 69°49'W	Traveling WNW.

TABLE 3 (continued)

Species	Number	Date	Location	Remarks
Pomarine Jaeger	1	8-16	40°46'N, 70°30'W	Adult, light phase.
Pomarine Jaeger	2	8-17	40°32'N, 69°29'W	Subadult and adult, light phase.
Pomarine Jaeger	1	8-21	41°59'N, 68°00'W	Light phase.
Pomarine Jaeger	1	8-21	41°54'N, 68°05'W	Dark phase.
Pomarine Jaeger	1	8-23	42°30'N, 68°37'W	Adult, light phase.
Pomarine Jaeger	1	8-23	42°30'N, 68°32'W	Adult, light phase.
Pomarine Jaeger	1	8-24	42°46'N, 68°00'W	Adult, light phase.
Pomarine Jaeger	1	8-24	43°00'N, 69°31'W	Light phase.
Pomarine Jaeger	2	8-25	41°49'N, 68°38'W	Adult, light phase.
Pomarine Jaeger	1	8-25	41°00'N, 68°36'W	Adult, light phase.
Pomarine Jaeger	1	8-26	41°11'N, 69°05'W	Light phase.
Pomarine Jaeger	2	8-26	40°51'N, 69°30'W	Adult, light phase.
Pomarine Jaeger	1	8-26	40°46'N, 69°29'W	Dark phase.
Pomarine Jaeger	1	8-27	40°45'N, 69°23'W	Subadult, light phase.
Pomarine Jaeger	1	8-27	40°42'N, 69°18'W	Dark phase.
Pomarine Jaeger	1	8-27	40°38'N, 69°13'W	Adult, light phase.
Pomarine Jaeger	3	8-27	40°31'N, 69°02'W	Immature, subadult, ad; light phase.
Pomarine Jaeger	2	8-27	40°30'N, 69°14'W	Light phase, 1 ad.
Pomarine Jaeger	1	8-27	40°30'N, 69°34'W	Subadult, light phase.
Great Skua	1	8-18	40°40'N, 68°30'W	Collected.
Great Skua	1	8-25	40°55'N, 68°37'W	
Unid. skua	1	8-22	41°37'N, 69°04'W	
Lesser Black-backed Gull?	1	8-23	42°30'N, 69°30'W	Soft color not seen, adult.

TABLE 3 (continued)

Species	Number	Date	Location	Remarks
Black-legged Kittiwake	1	8-23	42°30'N, 70°28'W	Immature.
Black-legged Kittiwake	1	8-23	42°30'N, 68°41'W	Immature.
Black-legged Kittiwake	1	8-24	42°42'N, 68°00'W	Adult.
Black-legged Kittiwake	1	8-24	43°01'N, 68°36'W	Second year.
Arctic Tern	10	8-16	40°31'N, 70°00'W	1 immature.
Arctic Tern	1	8-21	41°28'N, 69°19'W	Adult.
Arctic Tern	1	8-25	41°25'N, 68°35'W	Adult.
Arctic Tern	6	8-26	41°02'N, 69°17'W	Adults.
Arctic Tern	1	8-26	40°57'N, 69°21'W	Adult.
Arctic Tern	1	8-26	40°51'N, 69°30'W	Adult.
Unid. scoter	1	8-21	41°45'N, 68°13'W	Traveling W.

TABLE 4.

List of non-marine bird sightings

14 - 28 August 1978

Species	Number	Date	Location	Remarks
Black-throated Green Warbler	1	8-15	40°00'N, 70°57'W	Immature.
Tennessee Warbler	1	8-15	40°00'N, 70°30'W	Immature.
Northern Waterthrush	1	8-16	40°32'N, 70°30'W	
Barn Swallow	1	8-16	40°32'N, 70°30'W	
Tree Swallow	1	8-16	40°58'N, 70°30'W	
Blackburnian Warbler	1	8-18	40°07'N, 68°54'W	Immature.
Red-winged Blackbird	1	8-18	40°17'N, 68°44'W	Immature female.
Red-winged Blackbird	2	8-18	40°34'N, 68°30'W	Immatures.
Barn Swallows	2	8-18	40°34'N, 68°30'W	
Red-winged Blackbird	1	8-19	41°03'N, 68°34'W	Imm. male.
Mourning Dove	1	8-19	41°03'N, 68°34'W	
Cape May Warblers	4	8-19	40°29'N, 68°00'W	Immatures.
Cedar Waxwings	2	8-19	40°24'N, 68°00'W	Immatures.
Tree Swallow	1	8-19	40°27'N, 67°36'W	Immature.
Least Flycatcher	1	8-20	41°17'N, 67°29'W	
Black and White Warbler	1	8-21	41°54'N, 67°59'W	
Northern Waterthrush	1	8-21	41°54'N, 67°59'W	
Barn Swallow	1	8-21	41°36'N, 68°27'W	Immature.
Cape May Warbler	1	8-21	42°00'N, 69°00'W	Immature.
Peep (SESA?)	1	8-22	41°35'N, 69°31'W	
Tree Swallow	2	8-22	41°46'N, 69°30'W	Immatures.

TABLE 4 (continued)

Species	Number	Date	Location	Remarks
Cape May Warbler	2	8-22	41°57'N, 69°30'W	Immatures.
Tree Swallow	1	8-23	42°30'N, 69°10'W	Immature.
Cape May Warbler	1	8-24	43°00'N, 68°12'W	
Red-winged Blackbird	1	8-24	43°00'N, 68°30'W	Immature male.
Song Sparrow	1	8-24	43°01'N, 68°48'W	
Tennessee Warbler	1	8-24	43°00'N, 69°27'W	Immature.
Tree Swallow	1	8-24	43°00'N, 69°27'W	
Red-breasted Nuthatch	1	8-24	43°00'N, 69°45'W	
Cape May Warbler	1	8-25	41°12'N, 68°33'W	Immature.
Black Duck	2	8-26	41°12'N, 69°57'W	Traveling NNW.
Yellow-breasted Chat	1	8-27	40°30'N, 70°25'W	Immature.

TABLE 5.

List of marine mammal sightings

14 - 28 August 1978

Species	Number	Date	Location	Remarks
Finback (prob.)	1	8-16	40°12'N, 70°00'W	Over 50 ft. long.
Unid. delphinidae	5	8-16	40°00'N, 69°41'W	
Bottlenosed Dolphins (prob.)	6	8-19	40°24'N, 68°00'W	Leaping, playing?
Bottlenosed Dolphins	10	8-19	40°21'N, 67°46'W	Porpoising.
Bottlenosed Dolphins	2	8-19	40°30'N, 67°18'W	Rode bow wave.
Bottlenosed Dolphins	6	8-20	40°34'N, 67°02'W	Rode bow wave.
White-sided Dolphins	6	8-21	41°59'N, 68°53'W	Porpoising, avoided ship.
Finback (prob.)	1	8-22	41°37'N, 69°04'W	
Unid. rorqual	1	8-22	41°34'N, 69°02'W	
Finback (prob.)	2	8-22	41°28'N, 69°19'W	
Unid. rorqual	1	8-22	42°19'N, 70°14'W	
Unid. rorqual	5	8-22	42°25'N, 70°24'W	
Finback (prob.)	5	8-23	42°28'N, 70°29'W	Feeding?
Humpback Whale	1	8-23	42°28'N, 70°29'W	Feeding?
Minke (poss.)	5	8-23	42°28'N, 70°29'W	Feeding?
Unid. rorqual	1	8-24	43°00'N, 69°53'W	
Humpback (poss.)	1	8-25	41°29'N, 68°30'W	Breaching.
Humpback (poss.)	1	8-25	41°27'N, 68°32'W	Breaching.
Unid. rorqual	3	8-25	41°27'N, 68°32'W	Surfacing.
Unid. rorqual	7	8-25	41°25'N, 68°35'W	Surfacing.
Humpback (poss.)	1	8-25	41°10'N, 69°05'W	
Humpback	2	8-25	41°11'N, 69°05'W	Sounded, showed flukes.
Unid. dolphins	2	8-25	41°11'N, 69°05'W	Surfacing.
Unid. rorqual	1	8-26	41°08'N, 69°05'W	

TABLE 6.

List of Bird Specimens Collected by Species,

Number, Date and Location of Collection,

14 - 28 August 1978

<u>Species</u>	<u>Date</u>	<u>Number of Specimens</u>	<u>Location</u>
<i>Puffinus diomedea</i>	VIII-17	6	40°38'N, 69°28'W
	VIII-18	2	40°40'N, 68°30'W
	VIII-26	16	40°51'N, 69°30'W
	VIII-26	13	40°47'N, 69°27'W
<i>P. gravis</i>	VIII-17	2	40°38'N, 69°28'W
	VIII-18	3	40°00'N, 69°00'W
	VIII-21	4	41°59'N, 69°00'W
	VIII-22	8	41°28'N, 69°13'W
	VIII-25	1	40°56'N, 68°56'W
	VIII-25	2	40°58'N, 69°05'W
	VIII-26	8	41°11'N, 69°04'W
	VIII-26	1	40°51'N, 69°30'W
<i>P. griseus</i>	VIII-26	7	40°47'N, 69°27'W
	VIII-17	1	40°38'N, 69°24'W
	VIII-22	1	41°28'N, 69°13'W
<i>Oceanodroma leucorhoa</i>	VIII-26	2	41°11'N, 69°04'W
	VIII-17	1	40°00'N, 69°30'W

TABLE 6. (continued)

Species	Date	Number of Specimens	Location
<i>Oceanites oceanicus</i>	VIII-15	7	40°00'N, 70°56'W
	VIII-18	6	40°00'N, 69°00'W
	VIII-21	1	41°59'N, 69°00'W
	VIII-23	4	42°30'N, 68°37'W
	VIII-23	1	42°00'N, 68°00'W
	VIII-26	1	41°11'N, 69°04'W
<i>Stercorarius pomarinus</i>	VIII-17	2	40°38'N, 69°28'W
	VIII-27	1	40°31'N, 69°02'W
<i>Catharacta skua skua</i>	VIII-18	1	40°40'N, 68°30'W
<i>Larus marinus</i>	VIII-21	1	41°59'N, 69°00'W
	VIII-22	14	41°28'N, 69°13'W
	VIII-23	4	42°30'N, 68°37'W
	VIII-26	1	40°51'N, 69°30'W
<i>L. argentatus</i>	VIII-22	3	41°28'N, 69°13'W
	VIII-23	1	42°30'N, 68°37'W

FIGURE 1. Cruise track during daylight hours, 15-27 August 1978.

FIGURE 2a. Distribution map of
Cory's Shearwater,
15-27 August 1978.

FIGURE 2b. Distribution map of
Greater Shearwater,
15-27 August 1978.

FIGURE 2c. Distribution map of
Sooty Shearwater,
15-27 August 1978.

FIGURE 2d. Distribution map of
Leach's Storm-Petrel,
15-27 August 1978.

FIGURE 2e. Distribution map of
Wilson's Storm-Petrel,
15-27 August 1978.

FIGURE 2f. Distribution map of
Great Black-backed
Gull, 15-27 August,
1978.

FIGURE 2g. Distribution map of
Herring Gull,
15-27 August 1978.

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Transect ☒ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date (GMT) August	15	15	15	15	15	15	15	15	15	15	15	15	15	15	16
Region*	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE
Latitude (to nearest min.)	40-46	40-41	40-38	40-32	40-25	40-23	40-19	40-14	40-03	40-00	40-00	40-00	40-00	40-00	40-32
Longitude (to nearest min.)	71-00	71-00	71-00	71-00	71-00	71-00	71-00	71-01	71-00	70-57	70-45	70-42	70-37	70-30	70-30
Water depth (meters)	58	62	69	73	82	85	95	122	285	345	230	235	240	610	66
Total fixed-area (F.A.) birds	2	1	4	3	3	3	3	2	8	6	12	7	10	11	4
Area Sampled (km ²)	0.75	0.93	1.02	1.02	0.93	0.93	0.84	0.84	0.93	0.93	0.65	0.65	0.73	0.73	0.93
Density (F.A. birds/km ²)	2.67	1.08	3.92	2.94	3.23	3.23	3.57	2.38	8.60	6.45	18.46	10.77	10.75	11.33	4.30
Species	Number Observed														
Cory's Shearwater F.A.							1							1	
Tot.							1							1	
Greater Shearwater F.A.				1											
Tot.				1											
Wilson's Storm-Petrel F.A.	2	1	4	2	3	3	2	2	8	6	12	7	9	11	4
Tot.	10	1	7	2	3	4	6	2	14	47	13	13	18	17	5

TABLE 7. Summary of Transect or Station Census Data.

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TABLE 7. Summary of Transect or Station Census Data.

Observers K. D. Powers

Transect ☒ Station ☐ No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Date(GMT) August	16	16	16	16	16	16	16	16	16	16	17	17	17	17	17
Region*	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE
Latitude(to nearest min.)	40-23	40-18	40-12	40-08	40-04	40-00	40-00	40-00	40-00	40-00	40-08	40-12	40-17	40-28	40-32
Longitude(to nearest min.)	70-00	70-01	70-00	70-00	70-00	69-59	69-52	69-43	69-39	69-32	69-27	69-27	69-28	69-29	69-29
Water depth(meters)	77	85	92	113	147	150	142	130	125	116	95	86	76	62	55
Total fixed-area(F.A.)birds	8	3	4	4	4	4	4	27	4	10	2	12	1	5	6
Area Sampled(km ²)	0.93	0.93	1.02	0.84	0.84	0.93	0.93	0.93	0.93	0.93	0.93	0.93	1.02	0.84	0.93
Density (F.A. birds/km ²)	8.60	3.23	3.92	4.76	4.76	4.30	4.30	29.03	4.30	10.75	2.15	12.90	0.98	5.95	6.45
Species	Number Observed														
Cory's Shearwater F.A.	1														
Tot.	1														
Greater Shearwater F.A.														4	6
Tot.														4	6
Lubbock's Shearwater F.A.	1			1											
Tot.	1			1											
Wilson's Storm-Petrel F.A.	6	3	4	3	4	4	4	2	4	10	2	7	1	1	
Tot.	6	4	6	3	4	4	6	3	5	14	5	8	1	1	
Red Phalarope F.A.								25							
Tot.								25							
Unid. phalarope F.A.												5			
Tot.												5			

TABLE 7. Summary of Transect or Station Census Data.

Observers K. D. Powers

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TABLE 7. Summary of Transect or Station Census Data.

Observers K.D. Powers

[illegible]

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[illegible]

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Observers K.D. Powers

[illegible]

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Observers K. D. Powers

[illegible]

TABLE 7. Summary of Transect or Station Census Data.

Observers K. D. Powers

Transect ☒ Station ☐ No.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
Date(GMT) August	21	21	21	21	22	22	22	22	22	22	22	22	22	22	22
Region*	GM	GM	GM	GM	GM	GM	GM	GB	GB	GB	GM	GM	GM	GM	GM
Latitude(to nearest min.)	41-59	41-59	41-48	41-44	41-37	41-34	41-29	41-28	41-33	41-35	41-41	41-46	41-52	41-57	42-01
Longitude(to nearest min.)	68-45	68-53	69-00	69-00	69-04	69-02	69-06	69-19	69-30	69-31	69-31	69-30	69-30	69-30	69-34
Water depth(meters)	135	132	162	166	152	150	138	85	53	59	111	174	193	205	215
Total fixed-area(F.A.)birds	6	4	37	70	74	73	10	32	24	7	28	6	11	15	7
Area Sampled(km ²)	0.93	1.02	1.02	1.02	1.02	1.02	0.93	1.02	1.11	1.11	1.02	1.02	1.02	0.93	1.02
Density (F.A. birds/km ²)	6.45	3.92	36.27	68.63	72.55	71.57	10.75	31.37	21.62	6.31	27.45	5.88	10.78	16.13	6.86
Species	Number Observed														
Greater Shearwater F.A.	2	0		8	17	3	2	17	4	2	7		6	1	
Tot.	6	5		8	21	4	9	18	4	2	9		7	1	
Sooty Shearwater F.A.	1							0	2						
Tot.	1							1	2						
Lyon's Storm-Petrel F.A.	3		36	61	51	69	7	13	12	4	17	6	4	4	6
Tot.	3		45	76	64	76	9	16	13	9	25	9	7	6	9
Unid. storm-petrel F.A.		2													
Tot.		2													
Great Blk-backed Gull F.A.	0	2	1	1	1	1	0		5	1	3	0	0	7	1
Tot.	6	6	2	1	1	1	6		5	6	7	5	3	9	3
Herring Gull F.A.	0	0			5		1	2	1	0	1	0	1	3	0
Tot.	2	2			5		4	2	2	1	1	2	4	3	2

TABLE 7. Summary of Transect or Station Census Data.

Observers K. D. Powers

Transect ☒ Station ☐ No.	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
Date(GMT) August	22	22	22	22	22	22	22	22	22	22	23	23	23	23	23
Region*	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm	Gm
Latitude(to nearest min.)	42-01	42-02	42-05	42-07	42-09	42-12	42-15	42-19	42-22	42-25	42-30	42-30	42-30	42-30	42-30
Longitude(to nearest min.)	69-34	69-36	69-43	69-49	69-57	70-04	70-08	70-14	70-18	70-24	70-30	70-28	70-19	70-11	70-05
Water depth(meters)	215	217	206	135	135	96	56	41	31	65	60	62	170	70	75
Total fixed-area(F.A.)birds	7	11	14	12	42	57	12	3	2	9	29	12	4	7	12
Area Sampled(km ²)	1.02	1.02	1.02	0.93	1.02	0.93	0.93	0.93	0.93	1.02	0.93	0.93	1.02	1.02	1.02
Density (F.A. birds/km ²)	6.86	10.78	13.73	12.90	41.18	61.29	12.90	3.23	2.15	8.82	31.18	12.90	3.72	6.86	11.76
Species	Number Observed														
Greater Shearwater F.A.		2				1			1						
Tot.		2				1			1						
Wilson's Storm-Petrel F.A.	6	4	12	11	42	8	11	3	1	9		1	0	4	2
Tot.	9	4	19	11	137	8	13	3	1	13		1	2	4	2
Past Black-backed Gull F.A.	1	5	1	0	0	40	1			0	0	6	3	1	9
Tot.	2	6	2	3	1	40	2			1	2	6	3	5	9
Herring Gull F.A.	0		1	1		8					27	5	1	2	1
Tot.	2		1	5		8					64	5	1	5	1
Unid. lg. gull F.A.	1					0	0								
Tot.	2					9	2								
Unid. tern F.A.											2				
Tot.											2				

TABLE 7. Summary of Transect or Station Census Data.

Observers K.D. Powers

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TABLE 7. Summary of Transect or Station Census Data.

Observers K. D. Powers

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TABLE 7. Summary of Transect or Station Census Data.

Observers K. D. Powers

[illegible]

Cruise No. 7819

TABLE 7. Summary of Transect or Station Census Data.

1p USSR R/V ALIOT

Observers K.D. Powers

Transect ☒ Station ☐ No.	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
Date(GMT) August	26	26	26	26	26	26	26	26	27	27	27	27	27	27	27
Region*	GB	GB	GB	GB	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE
Latitude(to nearest min.)	41-08	41-06	41-04	41-01	40-57	40-54	40-54	40-50	40-48	40-45	40-40	40-38	40-35	40-30	40-30
Longitude(to nearest min.)	69-05	69-10	69-15	69-20	69-21	69-29	69-30	69-30	69-27	69-23	69-15	69-13	69-07	69-05	69-14
Water depth(meters)	100	70	53	49	44	45	38	40	41	44	55	58	76	76	72
Total fixed-area(F.A.)birds	43	85	47	90	21	9	25	35	44	45	5	6	9	1	5
Area Sampled(km ²)	0.75	0.75	0.84	0.84	0.84	1.02	0.75	0.93	0.75	1.02	0.93	1.02	1.02	0.93	0.93
Density (F.A. birds/km ²)	57.33	113.33	55.95	107.14	25.00	8.82	33.33	37.63	58.67	44.12	5.38	5.88	8.82	1.08	5.38
Species	Number Observed														
Cory's Shearwater F.A.								3	15	26	3		2	0	
Tot.								3	16	36	3		2	1	
Greater Shearwater F.A.	10	61	25	74	9	4	19	30	28	15	1		4	1	3
Tot.	11	70	40	77	9	4	29	37	29	37	1		4	1	4
Lesser Shearwater F.A.	1			1			1	1							
Tot.	1			1			1	1							
Wilson's Storm-Petrel F.A.	23	21	9	11	11	3	3	1		3		5	2		1
Tot.	29	26	19	15	13	4	3	1		3		5	2		1
Northern Phalarope F.A.						2									
Tot.						2									
Great Blk-backed Gull F.A.	8	2	4	1			2		1		1				
Tot.	8	2	4	1			2		3		1				
Herring Gull F.A.	1	1	9	3									1		
Tot.	1	1	9	4									1		
Arctic Tern F.A.					1										
Tot.					1										
Leach's Storm-Petrel F.A.										1					
Tot.										1					
Pomarine Jaeger F.A.												1			1
Tot.												1			2

TABLE 7. Summary of Transect or Station Census Data.

Observers K. D. Powers

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MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 13 - 16 September 1978

Cruise No. 7820

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Galen L. Pittman, Staff Biologist, Manomet Bird Observatory, aboard the R/V ALBATROSS IV from 13 - 16 September 1978. The objectives of the cruise were: (1) recover three subsurface moorings, each with three current meters, in the Northeast Channel; (2) set three new moorings across the northern edge of Georges Bank along $66^{\circ}40'W$; and (3) collect hydrographic data in the vicinity of the new moorings to determine water characteristics at the time of deployment. The observer was aboard the vessel on a non-interference basis primarily to collect information on the distribution and abundance of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the National Marine Fisheries Service (NMFS) for permitting observations aboard the R/V ALBATROSS IV. The observer thanks the captain, officers, and crew of the R/V ALBATROSS IV, in addition to Steven Ramp, Chief Scientist, and the scientific crew for their assistance aboard ship. Finally, acknowledgment is extended to H.C. Boyar, Vessel Coordinator for NMFS, for arranging passage, and The Department of Energy for support (DOE Contract No. EE-78-S-02-4706).

METHODS

Information was collected and put into four major field sets: event data, location data, environment data, and bird and mammal data. Bird data were collected using the following designs: transect censuses, total bird counts, and general observations. A transect census is a count of all birds by species within a fixed area, 300 m laterally by the distance (m) traveled in 10 minutes cruising time. A transect count provides information on relative density, i.e. birds per km². A total bird count is a count of all birds by species within sight of the ship for a period of 10 minutes. A total bird count includes ship-followers and provides information on relative abundance, i.e. birds seen per 10-minutes. Both methods require that the ship be moving on a constant course at a fixed speed of four kts or faster, and that visibility be at least one km during the counting period. Both techniques were employed simultaneously.

Marine mammals observed were identified to species when possible and note was made of the location and time of sighting, number sighted, behavior and other pertinent factors.

OBSERVATIONS

Table 1 - 6 summarizes the relative density and abundance bird data, and list sightings of rare or infrequently observed bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours and Figure 2a-c indicates the distribution of three bird species observed using the greatest total bird count of each species per 10-minute square latitude/longitude block surveyed.

Survey coverage was limited to Georges Basin and Northeast Channel in the Gulf of Maine and Northeast Peak of Georges Bank. Although few species

Cruise No. 7820

and low densities were recorded, the greatest bird activity occurred in the Northeast Peak and Channel area. A flock of 300 - 400 Greater Shearwaters was seen at $41^{\circ}52'N$, $66^{\circ}41'W$. Several fulmars, and a Cory's Shearwater, approximately 100 phalaropes, at least 9 jaegers (Pomarine and Parasitic), and 1 skua were also recorded in the area. Some fishing activity was noted.

TABLE 1.

Seabird Density in Selected Regions Using Fixed Area Transects

13 - 16 September 1978

<u>Region</u>	<u>Number of Transects</u>	<u>Total Km² Surveyed (Tkm²)</u>	<u>Total Birds (TB)</u>	<u>Mean Density² (TB/Tkm²)</u>	<u>Density Range (TB/Km²/Transect)</u>
Gulf of Maine	20	18.35	195	10.63	0.00 - 57.14
Georges Bank	5	4.07	120	29.48	1.28 - 119.35
North Coastal	5	4.83	4	0.83	0.00 - 2.15
South Coastal	1	1.07	1	0.93	

TABLE 2.

Number of Birds Per Species in Selected Regions (Using Fixed-Area Counts Only)

13 - 16 September 1978

<u>Species</u>	<u>Gulf of Maine</u>	<u>Georges Bank</u>	<u>North Coastal</u>	<u>South Coastal</u>
Northern Fulmar	2			
Greater Shearwater	72	76		
Wilson's Storm-Petrel	7			
Unid. Storm-Petrel	3			
Northern Phalarope	28			
Unid. Phalarope	41			
Pomarine Jaeger	5	1		
Unid. Jaeger	2			
Great Black-backed Gull	18	13	1	1
Herring Gull	14	5	1	
Unid. Large Gull	2	25	1	
Unid. Tern	1		1	

TABLE 3.

List of Rare or Infrequent Bird Sightings

13 - 16 September 1978

Species	Number	Date	Location	Remarks
Unid. jaeger	1	9-13	41°25'N, 70°45'W	Seen in Vineyard Sound
Gannet	22	9-13	42°04'N, 70°17'W	All age classes, flying NW
Unid. jaeger	1	9-13	42°08'N, 69°47'W	Dusky, flying S
Unid. phalarope	1	9-13	42°10'N, 69°23'W	Flying S
Pomarine Jaeger	1	9-13	42°11'N, 69°07'W	Dark phase, ad. - flying S
Pomarine Jaeger	1	9-14	41°54'N, 66°41'W	Intermed. phase - flying N
Pomarine Jaeger	3	9-15	42°12'N, 66°04'W	1-dark phase, ad. 2-intermediate phase, ad.
Unid. jaeger	1	9-15	42°12'N, 66°04'W	Milling around at a distance
Northern Fulmar	3	9-15	42°12'N, 66°04'W	Ship following
Pomarine Jaeger	1	9-15	42°12'N, 66°04'W	Intermed. phase ad., central rectrices projecting over 7 inches.
Cory's Shearwater	1	9-15	42°12'N, 66°04'W	
Northern Phalarope	36	9-15	42°16'N, 66°01'W	Flushed by ship
Red Phalarope	70	9-15	42°16'N, 66°01'W	Flushed by ship
Northern Fulmar	1	9-15	42°20'N, 65°57'W	Foraging
Unid. skua	1	9-15	42°22'N, 65°56'W	Charcoal black plumage, molting
Pomarine Jaeger	1	9-15	42°22'N, 65°56'W	Mottled and dusky
Pomarine Jaeger	1	9-15	42°30'N, 65°53'W	Dark phase.
Parasitic Jaeger (?)	1	9-15	42°22'N, 65°56'W	Intermed. phase, flying S
Unid. jaeger	1	9-15	42°11'N, 66°02'W	Dusky plumage, immature

TABLE 4.

List of Marine Mammal Sightings

13 - 16 September 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Unid. rorqual	5-7	9-13	42°10'N, 70°03'W	Numerous large spouts
Pilot Whale (poss.)	4-5	9-15	42°09'N, 66°05'W	Momentarily porpoising
Unid. rorqual	1	9-15	42°12'N, 66°04'W	Large high spout
Sei Whale (poss.)	1	9-15	42°16'N, 66°01'W	Back and fin exposed simultaneously while surfacing.
Unid. rorqual	1	9-15	42°25'N, 66°54'W	Large high spout
Unid. rorqual	1	9-15	42°13'N, 66°01'W	Large high spout
Unid. whale	1-2	9-15	42°11'N, 66°02'W	Distant spout

TABLE 5.

List of Non-Marine Bird Sightings

13 - 16 September 1978

<u>Species</u>	<u>Number</u>	<u>Date</u>	<u>Location</u>	<u>Remarks</u>
Cape May Warbler	1	9-14	41°52'N, 66°41'W	
Bay-breasted Warbler	1	9-14	42°02'N, 66°41'W	
Unid. Sparrow	1	9-14	42°02'N, 66°41'W	Immature
Black Tern (?)	1	9-15	42°21'N, 65°58'W	Winter plumage, ad.
Blue-winged Teal	16	9-16	41°38'N, 69°00'W	Traveling south

FIGURE 1. Approximate cruise track during daylight hours, 13 - 16 September 1978.

FIGURE 2a. Distribution map of
Greater Shearwater,
13 - 16 September
1978.

FIGURE 2b. Distribution map of
Great Black-backed
Gull, 13 - 16
September 1978.

FIGURE 2c. Distribution map of
Herring Gull,
13 - 16 September
1978.

TABLE 6. Summary of Transect or Station Census Data.

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TABLE 6. Summary of Transect or Station Census Data.

Ship Albatross - IVObservers Galen L. Pittman

Transect ☒ Station ☐ No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Date (GMT) <u>September 1978</u>	14	14	14	15	15	15	15	15	15	15	15	16	16	16	16
Region*	GB	GB	GB	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM
Latitude (to nearest min.)	41-54	41-58	42-04	42-09	42-14	42-16	42-20	42-25	42-27	42-21	42-15	41-44	41-42	41-40	41-38
Longitude (to nearest min.)	66-41	66-41	66-41	66-05	66-04	66-01	65-57	65-55	65-51	65-58	66-00	68-36	68-45	68-53	69-00
Water depth (meters)	64	70	76	238	245	265	233	214	120	231	240	173	165	128	150
Total fixed-area (F.A.) birds	4	1	3	21	14	29	24	3	2	1	49	32	7	7	1
Area Sampled (km ²)	0.78	0.78	1.07	0.93	0.56	0.93	0.42	1.07	0.97	0.93	0.97	0.97	1.02	0.97	0.97
Density (F.A. birds/km ²)	5.13	1.28	2.80	22.56	25.00	31.18	57.14	2.80	2.06	1.08	50.52	32.99	6.86	7.22	1.03
Species	Number Observed														
Northern Fulmar (FA)					1		1								
(TOT)					1		1								
Greater Shearwater (FA)	3	0	2	17	10	1	17	2	1	0	0	23	0	0	0
(TOT)	3	4	2	17	17	4	21	2	1	10	60	23	12	5	8
Wilson's Storm-Petrel (FA)				4	2			1							
(TOT)				4	4			1							
Unid. Storm-Petrel (FA)							3								
(TOT)							3								
Red Phalarope (FA)						0									
(TOT)						70									
Northern Phalarope (FA)						28									
(TOT)						36									
Unid. Phalarope (FA)						0					40				
(TOT)						7					40				
Pomarine Jaeger (FA)	1									1	3				
(TOT)	1									1	3				
Unid. Jaeger (FA)											1				
(TOT)											1				
Great Black-backed Gull (FA)	0	1	1	0			1		1	0	0	8	2	4	1
(TOT)	2	2	1	1			1		1	2	3	8	5	4	1
Herring Gull (FA)	0	0			1		1				5	1	3	3	
(TOT)	1	1			1		1				5	1	3	3	
Unid. Large Gull (FA)		0	0										2		
(TOT)		52	5										2		
Unid. Tern (FA)							1								
(TOT)							1								

TABLE 6. Summary of Transect or Station Census Data.

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