THE DISTRIBUTION OF MARINE BIRDS ON GEORGES BANK AND ADJACENT WATERS

Progress Report No. 2
for Period
April - June 1978

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Abstract

From 27 March to 20 June 1978, 7 cruises aboard U.S. Coast Guard cutters DECISIVE, VIGILANT, and VIGOROUS and the National Marine Fisheries Service research vessel ALBATROSS IV were made on outer continental shelf waters in regions from the mid-Atlantic to the Gulf of Maine and Scotian Shelf. A total of 13916 marine birds of at least 27 species were counted in 711.16 km^2 sampled from 730 fixed-area transects (300m wide by 10 minutes cruising time). An equal number of 10-minute total bird counts (no fixed area) were conducted at the same time.

All of MBO cruises conducted in 1978 have been transcribed onto computer data sheets and were proofed and verified. Seven of 24 MBO cruises made in 1977 have been transcribed. U.S. Fish and Wildlife Service Migratory Bird and Habitat Research Laboratory will keypunch the data.

From a review of over 100 scientific papers and books, food habits of fulmars, shearwaters, storm-petrels, gannets, gulls, and alcids were referenced by bird species and author.

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 second quarter (April - June 1978) and will devote full time to the third quarter (July - September 1978).

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1. Bird distributions: Georges Bank and adjacent continental shelf waters.

From 27 March to 20 June 1978, 7 cruises were made by staff and a volunteer observer aboard U.S. Coast Guard cutters and the National Marine Fisheries Service R/V ALBATROSS IV (Table 1). Reports were compiled for each cruise and are appended to the progress report.* The regions of the continental shelf and areas off the shelf surveyed in the second quarter were listed with summary data of bird densities and area sampled from fixed-area transects (Table 2). In addition, 730 total bird counts were made at the same time that fixed-area transects were conducted. Total bird count data are indicated in the summary tables and species distribution maps of each cruise report.* A tentative cruise schedule for the third quarter is presented in Table 3.

A narrative summary of bird distributions by species and species group is as follows:

Fulmars, shearwaters, storm-petrels. Northern Fulmars *(Fulmarus glacialis)* were abundant on the Northern Edge, Northeast Peak, and Southeast Part of Georges Bank and adjacent waters of Georges Basin in the Gulf of Maine. Ful-

* See Distribution Lists.

TABLE 1.

List of Dates, Vessel, Cooperating Agency, Port of Departure, and Observers for MBO Cruises made in Second Quarter of 1978.

MBO CRUISE NO.	CRUISE DATES	VESSEL	COOPERATING AGENCY AND PORT	OBSERVER
7806	27 Mar-3 Apr	CGC DECISIVE	USCG (New Castle)	K.D. Powers
7807	3 - 13 Apr	R/V ALBATROSS IV	NOAA/NMFS (Woods Hole)	G.L. Pittman
7808	3 - 19 Apr	CGC VIGILANT	USCG (New Bedford)	A.W. Nickerson
7809	17 Apr-3 May	R/V ALBATROSS IV	NOAA/NMFS (Woods Hole)	K.D. Powers
7810	8 - 25 May	R/V ALBATROSS IV	NOAA/NMFS (Woods Hole)	G.L. Pittman
7811	26 May-12 June	CGC VIGILANT	USCG (New Bedford)	A.W. Nickerson
7812	6 - 20 June	CGC VIGOROUS	USCG (New London)	R.R. Veit

TABLE 2.

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

REGION	NUMBER OF TRANSECTS	AREA SURVEYED (KM^2)	TOTAL BIRDS (TB)	RELATIVE DENSITY (TB/KM^2)
Scotian Shelf	36	35.95	394	10.96
W. Nova Scotia	16	12.96	83	6.40
Gulf of Maine	193	181.29	1938	10.69
Georges Bank	261	248.25	8957	36.08
S. New England	131	130.40	1875	14.38
Mid-Atlantic	24	25.86	62	2.40
Off Continental Shelf	33	40.29	297	7.37
North Coastal	12	11.78	60	5.09
South Coastal	24	24.38	250	10.25

TABLE 3.

Tentative Schedule of MBO Cruises to be Conducted in the Third Quarter of 1978 (July - September).

CRUISE DATES	VESSEL AND AGENCY	PORT OF DEPARTURE
20 - 28 June	R/V ALIOT (USSR and NOAA/NMFS)	Woods Hole
20 June-1 July	R/V ALBATROSS IV (NOAA/NMFS)	Woods Hole
5 - 21 July	R/V ALBATROSS IV (NOAA/NMFS)	Woods Hole
6 - 20 July	CGC VIGILANT (USCG)	New Bedford
20 July-1 Aug	CGC ACTIVE (USCG)	Newcastle
15 - 28 July	R/V ALIOT (USSR and NOAA/NMFS)	Woods Hole
1 - 13 Aug	R/V ALIOT (USSR and NOAA/NMFS)	Woods Hole
15 - 30 Aug	R/V ALIOT (USSR and NOAA/NMFS)	Woods Hole
15 - 29 Aug	CGC ACTIVE (USCG)	Newcastle

mar concentrations of 1000-3000 were associated with fishing operations in the previously mentioned areas. An estimated 8000 fulmars were in the vicinity of at least 30 fishing vessels along the Northern Edge from Cultivator Shoals east to the Northeast Peak on June 8-10. Concentrations recorded with a Soviet fishing fleet in mid-April near Lydonia Canyon were not evident there in June.

Cory's Shearwater *(Puffinus diomedea)* was first recorded on June 6 at 40°55'N,71°19'W. Cory's were evident in small numbers along the edge of the continental shelf south of Cape Cod, on the shelf in the mid-Atlantic region, and in slope waters approximately 100 miles S of Nantucket Island in June.

Greater Shearwaters *(P. gravis)* were first recorded on April 19 at 40°50'N,66°47'W, and were common in Southern New England waters in late May. Greaters arrived en masse probably in early June on Georges Bank where tens of thousands were associated with fishing activities on the Northern Edge and Northeast Peak.

Sooty Shearwaters *(P. griseus)* were first recorded on April 5 in the mid-Atlantic region and on the southern edge of Georges Bank. Sootys were evident throughout New England waters in May. On June 6 a concentration of ca. 3000 Sootys was recorded at 40°55'N,71°19'W in Southern New England and several thousand were associated with fishing activities on the Northern Edge and Northeast Peak of Georges Bank in mid-June.

Three sightings of single Manx Shearwaters *(P. puffins)* were recorded on Georges Bank near fishing activities and one sighting was made in slope waters at 40°00'N,67°00'W southeast of Georges Bank.

An Audubon's Shearwater *(P. lherminieri)* was recorded on June 13 at 38°34'N,70°23'N.

Leach's Storm-Petrel *(Oceanodroma leucorhoa)* was first recorded on April 5 at 40°18'N,67°32'W. Leach's were regularly recorded in slope waters south and east of Georges Bank, eastern Georges Bank, and Northeast Channel in late April and June.

Wilson's Storm-Petrels *(Oceanites oceanicus)* were first recorded in slope waters southwest, south, and east of Georges Bank in mid-April, and were evident in the Gulf of Maine in early May. Several flocks of 200-1000 Wilson's were recorded in waters of Southern New England, Georges Bank, and Gulf of Maine in May and June but not always in association with fishing activities.

Gannets. Gannets *(Morus bassanus)* were abundant along the edge of the continental shelf from Southern New England waters to Lydonia Canyon on Georges Bank in mid-April. Gannets were common throughout northeast areas of Georges Bank in late April. Over 90 percent of gannets observed in April were adults. Subadults and juveniles were dominant in May. No gannets were recorded in June.

Phalaropes. Positive sightings of Red Phalaropes *(Phalaropus fulicarius)* were recorded on Southern New England and Georges Bank in late April - early May. Sightings of Red's on the Northeast Channel and Browns Bank were made in early June.

Positive sightings of Northern Phalaropes *(Lobipes lobatus)* were more frequent along the northern New England coast in May, although few were recorded on Georges Bank. Approximately 5000 Northerns were seen near Eastport, Maine on 28 May.

Jaegers and skuas. Pomarine Jaegers *(Stercorarius pomarinus)* were recorded in Southern New England and Georges Bank waters. Although Pomarines

were recorded from April-June, most sightings were along the southern edge of Georges Bank in mid-April.

An adult Long-tailed Jaeger *(S. longicaudus)* without tail streamers was seen on June 7 at 40°49'N,67°03'W.

Five unidentified skuas, a Great Skua *(Catharacta skua)* and 7 South Polar Skuas *(C. maccormicki)* were recorded in Southern New England and Georges Bank waters in late May and June. At least two individual South Polar Skuas were photographed.

Gulls and terns. Infrequent sightings of single Glaucous Gulls *(Larus hyperboreus)* and Iceland Gulls *(L. glaucoides)* were recorded in April on Southern New England and Georges Bank.

Great Black-backed Gulls *(L. marinus)* and Herring Gulls *(L. argentatus)* were abundant from the mid-Atlantic area to the Gulf of Maine in April. Concentrations of several thousand of each species were associated with fishing activities near Lydonia Canyon in mid-April. By late May both species were nearly absent from most offshore areas, but abundant near coastal fishing areas (e.g. Jeffreys Ledge).

Black-legged Kittiwakes *(Rissa tridactyla)* were infrequently seen in most areas surveyed from April-June.

Sightings of Common Terns *(Sterna hirundo)* and Arctic Terns *(S. paradisaea)* were recorded in late May and June throughout most areas surveyed. A notable sighting of 4 first-year Arctic Terns was recorded on June 7 at 41°47'N,67°00'W.

Alcids. Sightings of Razorbills *(Alca torda)* were recorded in shallow waters just south of Nantucket Island and Little Georges Bank in April. Common Murres *(Uria aalge)* and Thick-billed Murres *(U. lomvia)* were positively identified. In April murres and unidentified large alcids were frequently seen in Southern New England and Georges Bank waters, particularly along the edge of continental shelf and slope of the Northern Edge.

Dovekies *(Alle alle)* were regularly seen on Georges Bank in April, particularly along the Northern Edge.

Seven sightings of Common Puffins *(Fratercula artica)* on Georges Bank were recorded in April and four single adults were seen in June.

2. Data transcription. The Migratory Bird and Habitat Research Laboratory at Patuxent, MD has agreed to keypunch all MBO seabird data. All cruises made in 1978 have been transcribed, proofed and verified. During the third quarter 1978 data will be sent to MBHRL for keypunching. Only 7 of 24 cruises made in 1977 have been transcribed.

More time and effort will be directed at transcribing, proofing and verifying 1977 data during the third quarter. All information collected in third quarter will be transcribed, proofed, and verified.

3. Investigation of food resources. From a review of over 100 scientific papers and books, food habits of fulmars, shearwaters, storm-petrels, gannets, gulls, and alcids were referenced by bird species and author in Table 4. The

distribution of several prey items will be examined from information collected by the Groundfish Survey Unit of the National Marine Fisheries Service at Woods Hole. Those prey items selected for distributional examination will be potentially important to several bird species and are common to abundant in the study area.

TABLE 4.

List of References (Author and Prey Items)
Concerning Feeding Habits of Marine Birds.

Northern Fulmar *(Fulmarus glacialis)*

Bent (1922)--fishes, cephalopods, whale fat, other oily substances.

Seligman and Wilcox (1940)--cuttlefish *(Sepia)*, prawns *(Hymendora glacialis)*.

Fisher (1952)--primarily a plankton eater, but is almost omnivorous: crustaceans (decapods, schizapods, cumaceans, isopods, amphipods), annelids, chaetognaths, cephalopods, ctenophores, scyphozoans, live fish, and offal.

Palmer (1962)--fishes (gadids), fish offal, mollusks, crustaceans, carrion, amphipods, copepods, pteropods, shrimp, cephalopods.

Brown (1970)--"It is impossible to say what the basic food of the fulmar was before offal became abundant, since we have little quantitative data on their feeding habits even today." Need to determine seasonal relative importance of "live" food to offal.

Shuntov (1974)--offal from industrial fishing ships.

Cramp et al. (1974)--offal and zooplankton (jellyfish, ctenophores, copepods, isopods, amphipods, and euphasiids.

Cory's Shearwater *(Puffinus diomedea)*

Bent (1922)--fishes, crabs, oily substances, offal from fishing vessels.

Palmer (1962)--cephalopods (including *Loligo*), fishes (including *Clupea*) crustaceans.

Watson (1966)--cephalopods, small fish.

Greater Shearwater *(P. gravis)*

Bent (1922)--small fish (including *Ammodytes*) squid, offal.

Rowan (1952)--squid, occasional crustacean fed to chicks.

(continued)

TABLE 4. (continued)

Greater Shearwater (continued)

Rees (1961)--scavenging offal from fishing vessels and squid *(Ilex)*.

Palmer (1962)--fish (including *Mallotus*), offal, squid.

Watson (1966)--squid, fish, crustaceans.

Sooty Shearwater *(P. griseus)*

Bent (1922)--squid, small fish *(Ammodytes, Mallotus)*, offal.

Palmer (1962)--squid *(Loligo)*, small fish *(Ammodytes, Mallotus, Engraulis)*, fish offal.

Watson (1966)--mainly squid in No. Atlantic; crustaceans and small fish on breeding grounds.

Wiens and Scott (1975)--mainly anchovy *(Engraulis)*, but other fish and squid.

Manx Shearwater *(P. puffinus)*

Palmer (1962)--small fish *(Clupea, Engraulis)*, crustacea, squid, and surface-floating offal.

Cramp et al. (1972)--small fish *(Clupea)*.

Leach's Storm-Petrel *(Oceanodroma leucorhoa)*

Bent (1922)--oily substances from whales, seals and fishing vessels; shrimps, other small crustacea, small fishes.

Gloss (1935)--refuse matter from whales and seals, tiny mollusks, small transparent squids (in Bay of Fundy).

Palmer (1962)--euphasiid crustaceans, hyperiid amphipods, copepod *(Temora)*.

Watson (1966)--largely crustaceans and some fish, attracted to oily chum from fishing vessels.

Ainley et al. (1974)--fish small and cephalopods, siphonophore *(Vellella vellella)*.

Cramp et al. (1974)--surface dwelling zooplankton including small squid and fish.

Wiens and Scott (1975)--hydrozoa, euphasiids, squid, fish.

(continued)

TABLE 4. (continued)

Wilson's Storm-Petrel *(Oceanites oceanicus)*

Bent (1922)--oily substances from offal.

Palmer (1962)--euphasiids, offal, small fish, squid.

Watson (1966)--euphasiids (shrimp), planktonic crustaceans, small fish, offal, plankton churned up by propellers in ship's wake.

Gannet *(Morus bassanus)*

Gurney (1913)--primarily fish *(Clupea, Scomber, Gadus, Ammodytes, Mallotus, Engraulis)*, but will eat cuttlefish *(Sepia)* and squid.

Bent (1922)--entirely fish, feed on *Clupea* on New England coast in fall.

Palmer (1962)--fish (see Gurney 1913)

Watson (1966)--school fish, offal

Cramp et al. (1974)--fish (see Gurney 1913), offal.

Great Black-backed Gull *(Larus marinus)* and Herring Gull *(L. argentatus)*

Omnivorous, at sea mainly feed on offal--Bent (1921), Belopol'skii (1961), Harris (1965), Watson (1966), Threlfall (1968), Vermeer (1973), Cramp et al. (1974), Kihlman and Larsson (1974), Seymour (1974).

Black-legged Kittiwake *(Rissa tridactyla)*

Seligman and Wilcox (1940)--fish, cuttlefish *(Sepia)*, mollusks, crustaceans.

Threlfall (1968)--primarily fish (including *Mallotus*), crustaceans, mollusks, echinoderms, offal.

Cramp et al. (1974)--prefers fish but will use wide range of planktonic invertebrates; offal; little information on winter food habits.

Razorbill *(Alca torda)*

Madsen (1957)--primarily fish *(Clupea, Ammodytes, Mallotus, Gasterosteidae)*, but eats crustaceans (mysids, amphipods) and mollusks.

Harris (1970)--primarily fish *(Clupea, Ammodytes)*.

Tuck (1961)--fish *(Mallotus)* and crustacea.

Cramp et al. (1974)--fish *(Clupea, Ammodytes)*, crustacea, mollusks.

(continued)

TABLE 4. (continued)

Thick-billed Murre *(Uria lomvia)* and Common Murre *(U. aalge)*

Seligman and Wilcox (1940)--fish *(Clupea, Mallotus, Leptoclinus)*, cuttlefish *(Sepia)*, crustacea.

Tuck (1961)--primarily fish *(Mallotus, Gadus, Melanogrammus, Clupea, Ammodytes, Boreogadus)*, also uses crustaceans and polychaetes.

Harris (1970)--fish *(Ammodytes, Clupea)*.

Ogi and Tsujita (1973)--larval and juvenile fish *(Ammodytes, Mallotus, Theragra)*, euphasiids *(Thysanoessa)*, amphipods *(Euthemisto, Hyperia)*, squids, and will use plankton.

Shuntov (1974)--primarily schooling fish *(Boreogadus, Mallotus, Ammodytes, Clupea* fry, *Gadus* fry) and to a lesser extent on plankton.

Cramp et al. (1974)--primarily schooling fish *(Ammodytes, Clupea)*, also crustacea, annelids, mollusks.

Common Puffin *(Fratercula arctica)*

Harris (1970)--fish (*Ammodytes, Clupea* fry).

Corkhill (1973)--fish (*Ammodytes, Clupea)*.

Cramp et al. (1974)--winter food unknown; small fish (*Ammodytes, Clupea* fry), whitings fed to chicks.

(concluded)

DISTRIBUTION LISTS

List A

Senator Edward Kennedy

Congressman Paul Tsongas

Congressman Gerry Studds

Ralph Andrews, USFWS

H. C. Boyar, NMFS, Woods Hole

Kenneth Sherman, NMFS, Narragansett

Philip Stanton, Wildlife Rehabilitation Center

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, 27 March - 03 April 1978

MBO Cruise No. 7806

INTRODUCTION

The following report summarizes bird and mammal observations made by Kevin D. Powers, Staff Biologist, Manomet Bird Observatory, in the Gulf of Maine aboard the USCGC DECISIVE from 28 March to 2 April 1978. The objectives of the patrol were offshore fisheries law enforcement and search and rescue. The observer was aboard on a non-interference basis primarily to collect information on distribution, abundance and behavior of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the U. S. Coast Guard for allowing an observer to join the patrol. The Observer thanks Cmdr. A. B. Smith, the officers and crew of USCGC DECISIVE for their assistance aboard ship. Financial support of MBO seabird studies is provided by the U. S. Department of Energy (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 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 Figures 2a-d indicate the distribution of four bird species observed using the greatest total bird count of each species per 10-minute square latitude/longitude block surveyed.

Some striking contrasts emerged from the information collected during this cruise compared to cruises made in January and February in the Gulf of Maine. Northern Fulmar were seen regularly but never more than 10 individuals at one time. No fulmar concentrations comparable to those recorded on MBO Cruise No. 7802 were evident in the Gulf of Maine. Those birds had apparently moved elsewhere.

Great Black-backed and Herring Gulls were common but not abundant during this cruise, as they were in January and February. Two factors probably contributed to this change: (1) fishing in the Gulf of Maine was closed on haddock and cod at this time which restricted commercial fishing operations to almost nil; and (2) breeding adult gulls were probably in attendance at nearby colonies on the Maine, Massachusetts, and maritime provincial coasts.

Black-legged Kittiwakes which were abundant in the Gulf of Maine in January and February had moved out of the area, probably migrating to breeding colonies further north.

Alcids (razorbills, murres, dovekies, and puffins) which were regularly recorded in small numbers earlier in the year in the Gulf of Maine were almost absent. Only one unidentified large alcid was seen. The alcids may have also undertaken a northeast migration to breeding areas.

One final note can be made concerning marine mammals. Blows were frequently observed in the Jeffreys Bank area of the Gulf of Maine, and two individual whales were identified as finbacks. Other mammals sighted were suspected to be of the same species.

TABLE 1.

Seabird Density in Selected Regions from
Fixed-area Transects, 28 March - 02 April 1978.

REGION	NUMBER OF TRANSECTS	TOTAL km^2 SURVEYED (Tkm^2)	TOTAL BIRDS (TB)	MEAN DENSITY (TB/Tkm^2)	DENSITY RANGE (TB/km^2/transect)
North Coastal	4	2.78	9	3.24	0 - 2.59
Gulf of Maine	36	30.56	59	1.93	0 - 15.22

TABLE 2.

Number of Birds per Species in Selected Regions
(Using Fixed-area Transects Only), 28 March - 02 April 1978.

SPECIES	NORTH COASTAL	GULF OF MAINE
Northern Fulmar	---	16
Gannet	1	2
Common Eider	---	11
Oldsquaw	2	---
Great Black-backed Gull	5	16
Herring Gull	1	13
Large alcid	---	1

TABLE 3.

List of Rare or Infrequent Species Sightings
28 March - 02 April 1978.

SPECIES	NUMBER	DATE	LOCATION	REMARKS
Iceland Gull	1	3-28	43°13'N, 70°07'W	Ship following (2W)
Gannet	1	3-28	43°25'N, 69°52'W	Flying near ship
Gannet	1	3-29	43°27'N, 69°15'W	Flying near ship
Gannet	1	3-29	43°28'N, 68°27'W	
Black-legged Kittiwake	1	3-31	43°17'N, 68°38'W	Associated with fishing boat
Unidentified large alcid	1	3-31	43°21'N, 68°37'W	Travelling NE
Gannet	2	3-31	43°11'N, 69°44 W	Flying near ship

TABLE 4.

List of Marine Mammal Sightings
28 March - 02 April 1978.

SPECIES	NUMBER	DATE	LOCATION	REMARKS
Unid. Whale	1	3-29	43°30'N, 68°40'W	One blow, surfacing
Harbor Seal	1	3-30	44°31'N, 67°18'W	Approached ship/ curious
Unid. rorqual	2	3-30	43°22'N, 68°30'W	Two blows, surfacing
Finback Whale	2	3-31	43°18'N, 68°29'W	Diving
Unidentified rorqual	2	3-31	43°23'N, 68°42'W	Four blows, surfacing

TABLE 5.

List of Non-marine Bird Sightings
28 March - 02 April 1978.

SPECIES	NUMBER	DATE	LOCATION	REMARKS
Red-winged Blackbird	2	3-28	43°22'N, 70°06'W	On ship
Dark-eyed Junco	1	3-29	43°27'N, 69°15'W	On ship
Mourning Dove	1	3-29	43°31'N, 69°10'W	On ship
Song Sparrow	1	3-29	43°28'N, 68°27'W	On ship
Dark-eyed Junco	1	3-31	43°18'N, 68°29'W	On ship
Dark-eyed Junco	1	4-02	42°10'N, 70°07'W	On ship

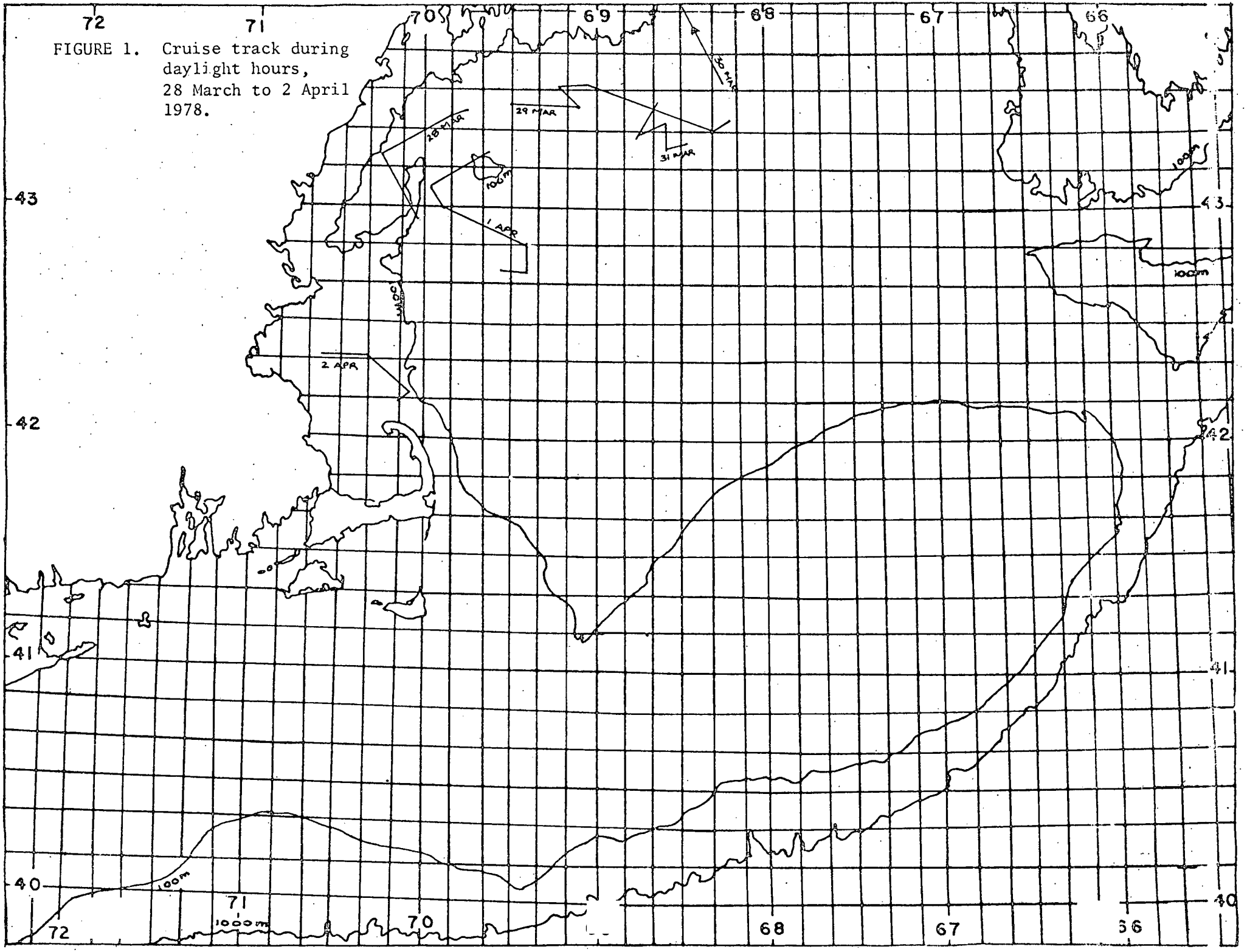

FIGURE 1. Cruise track during daylight hours, 28 March to 2 April 1978.

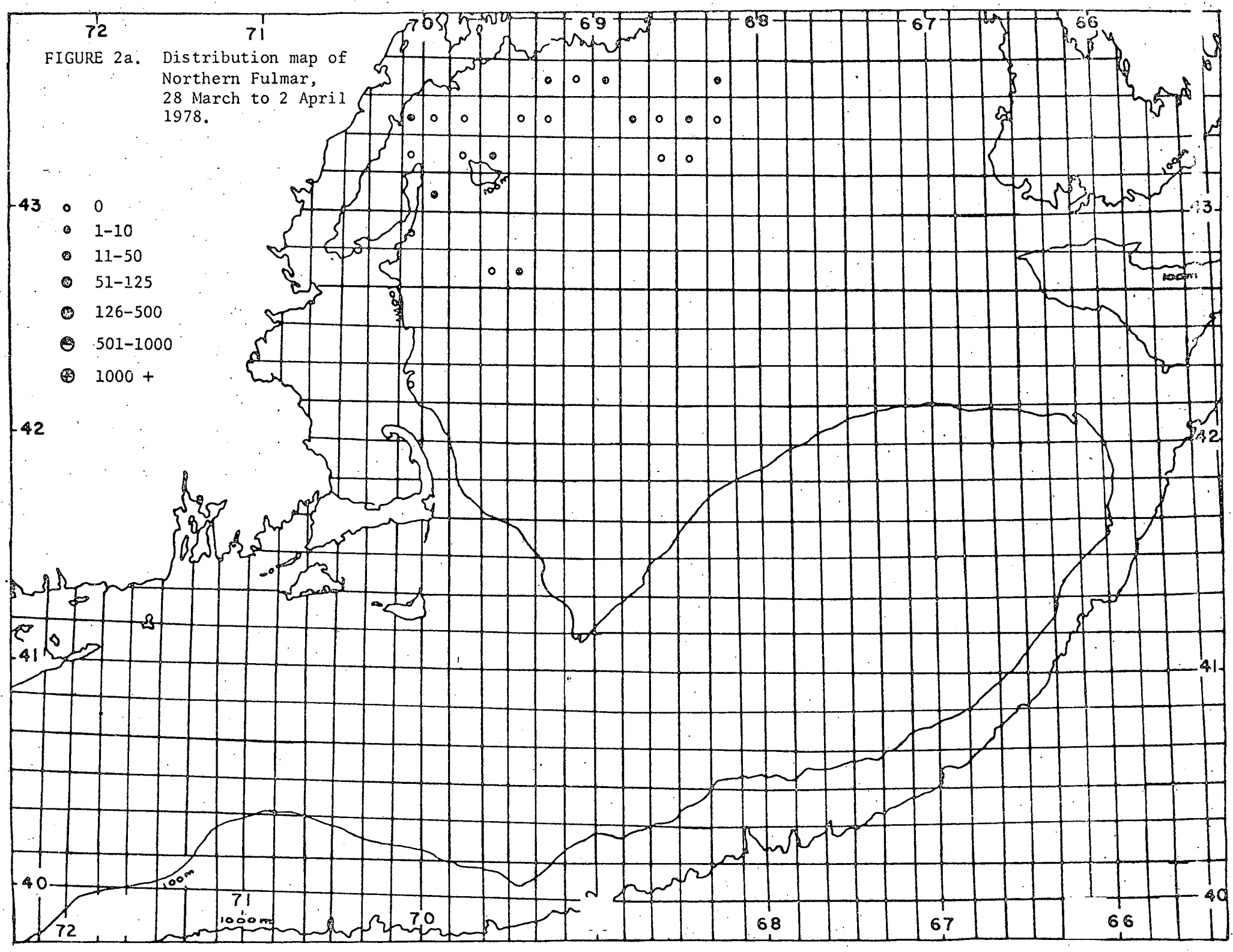

FIGURE 2a. Distribution map of Northern Fulmar, 28 March to 2 April 1978.

Cruise No. 7806

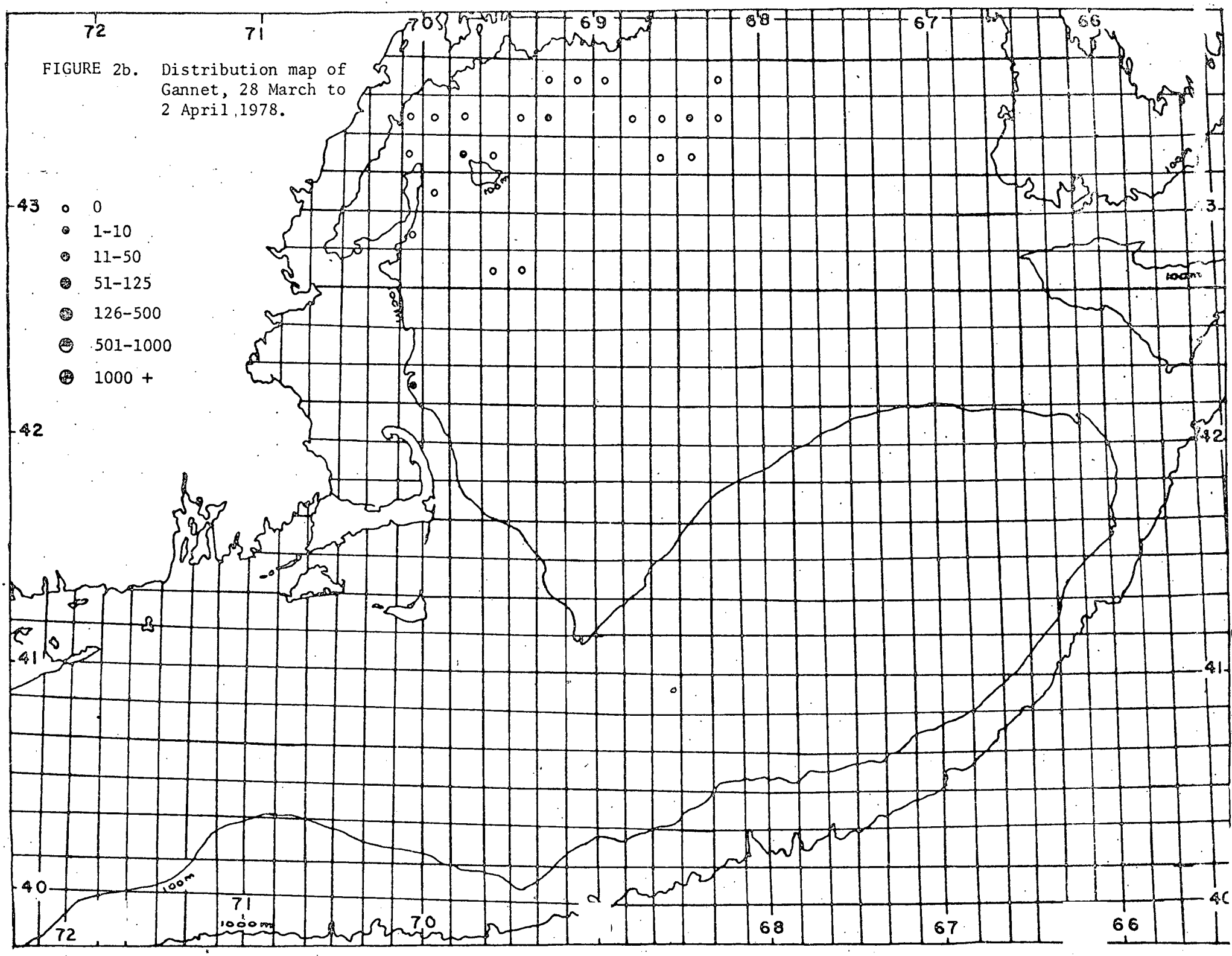

FIGURE 2b. Distribution map of Gannet, 28 March to 2 April 1978.

Cruise No. 7806

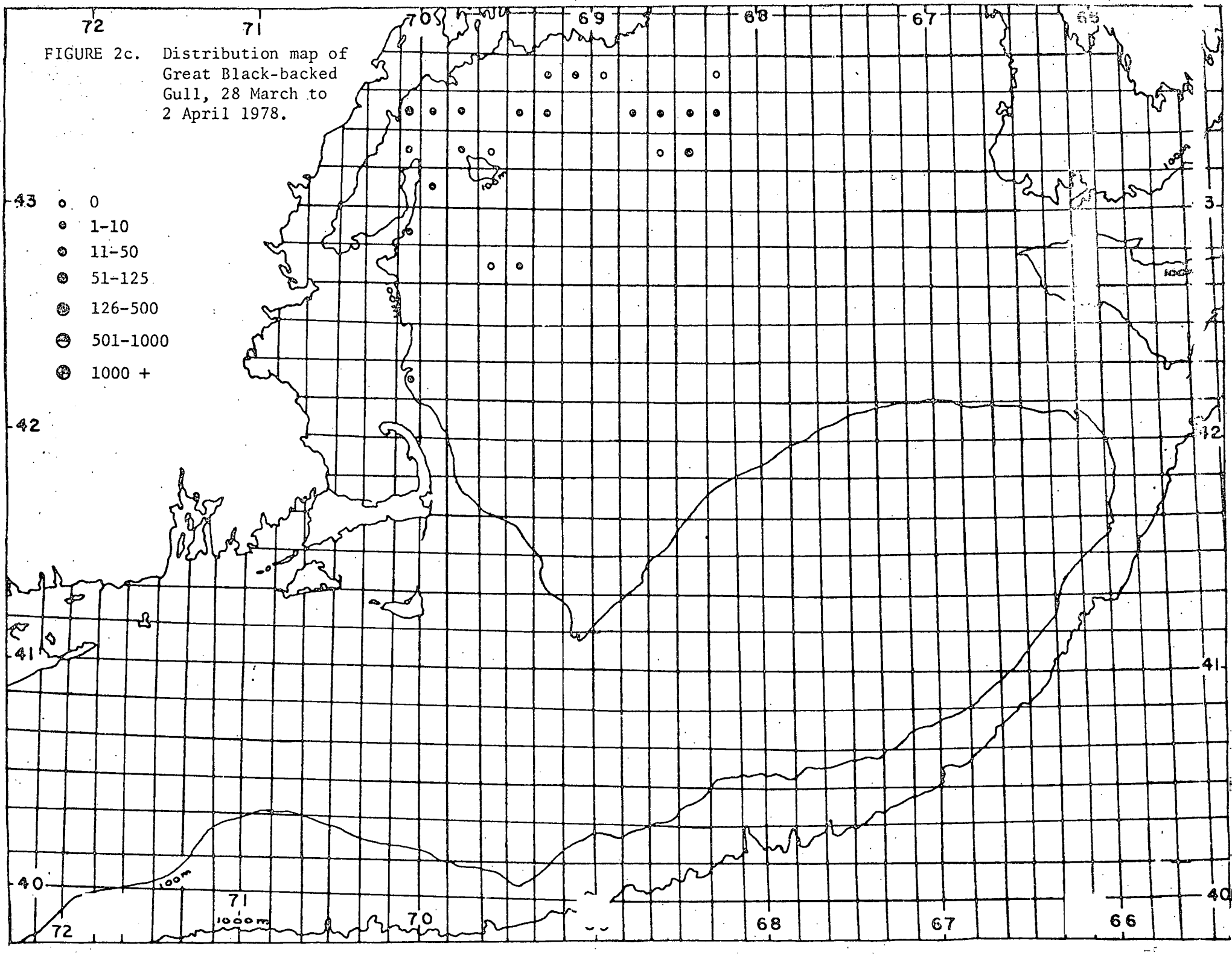

FIGURE 2c. Distribution map of Great Black-backed Gull, 28 March to 2 April 1978.

Cruise No. 7806

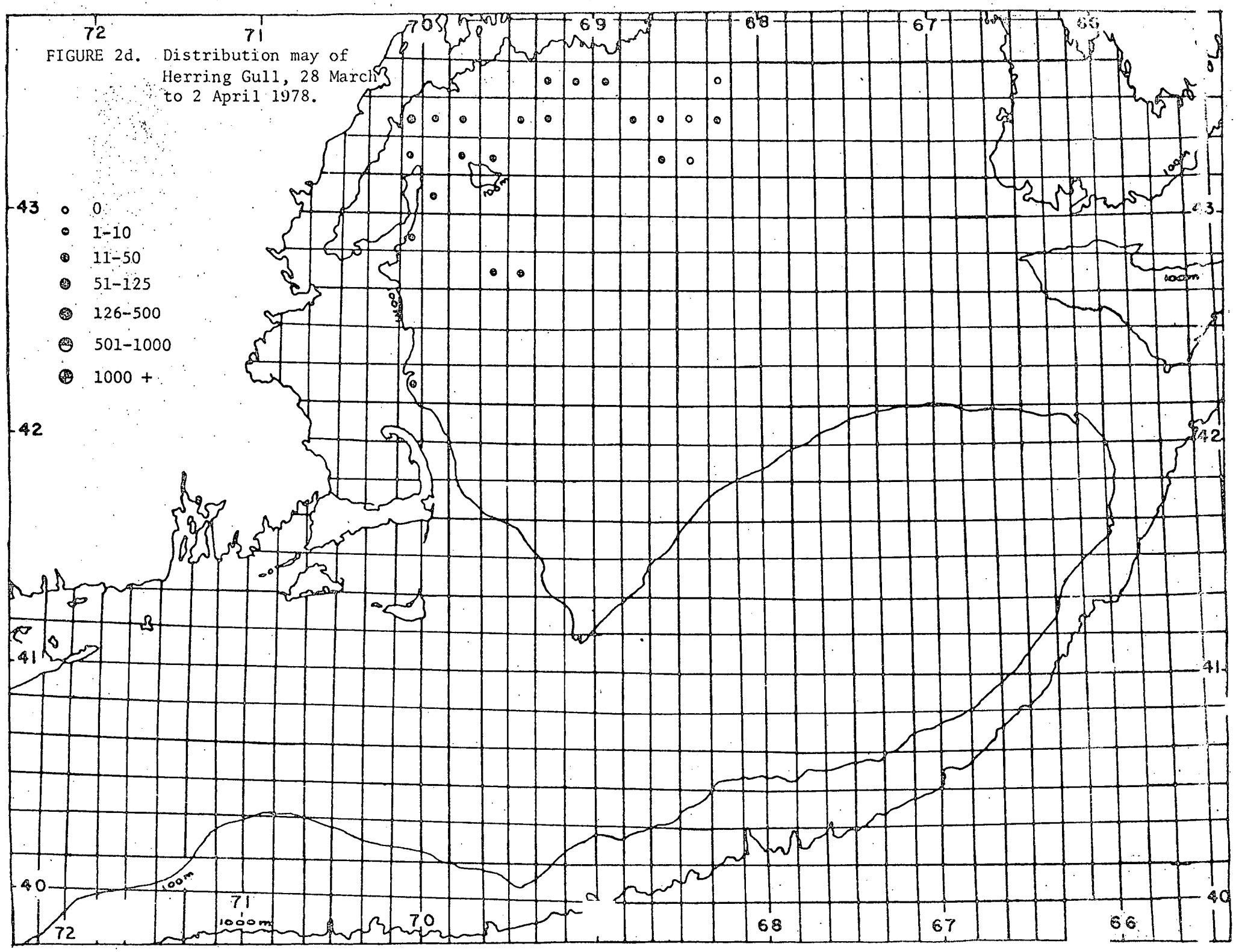

FIGURE 2d. Distribution may of Herring Gull, 28 March to 2 April 1978.

TABLE 6. Summary of Transect or Station Census Data.

USCGC DECISIVE Observers K.D. Powers

Transect ☑ Station ☐ No.	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Date (GMT)	3/28	3/28	3/28	3/28	3/28	3/28	3/29	3/29	3/29	3/29	3/29	3/29	3/29	3/29	3/29
Region*	Gulf of Maine/GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM
Latitude (to nearest min.)	42-59	43-13	43-22	43-22	43-23	43-24	43-27	43-26	43-30	43-31	43-30	43-30	43-29	43-28	43-23
Longitude (to nearest min.)	70-00	70-07	70-06	69-56	69-50	69-45	69-20	69-15	69-15	69-09	68-03	68-50	68-40	68-27	68-12
Water depth (meters)	155	142	128	157	128	112	163	166	146	132	110	102	128	146	190
Total number birds (transect)	2	2	3	0	0	1	0	3	3	3	2	0	4	1	0
Area Sampled (km^2)	0.37	0.65	0.65	0.56	0.37	0.37	1.20	0.74	0.37	0.33	0.83	0.93	1.30	1.30	1.40
Density (Birds / km^2)	5.41	3.08	4.62	0.00	0.00	2.70	0.00	4.05	8.11	3.61	2.41	0.00	3.08	0.77	0.00
Species	Number Observed														
Northern Fulmar F.A.	2		1						1			0	1	0	
Tot.	2		1						1			1	1	1	
Common Eider F.A.		2									2				
tot.		2									2				
I[illegible]and Gull F.A.		0	0												
Tot.		1	1												
Great Black-backed Gull F.A.	0	0	2	0	0	0	0	1	1	1			3	0	0
Tot.	6	4	16	4	5	2	5	6	1	1			4	2	2
Herring Gull F.A.	0	0	0	0	0	1	0	1	1	2		0	0		0
Total	4	4	31	6	1	1	2	1	2	2		1	1		4
Unid. large gull F.A.								0							
Tot.								1							
Gannet F.A.								1						1	
Tot.								1						1	

TABLE 6. Summary of Transect or Station Census Data.

S CGC DECISIVE Observers K.D. Powers

Transect ☑ Station ☐ No.	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030
Date (GMT)	3/30	3/30	3/30	3/30	3/30	3/30	3/30	3/30	3/30	3/30	3/31	3/31	3/31	3/31	3/31
Region*	GOM	GOM	GOM	GOM	N. Coastal NC	NC	NC	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM
Latitude (to nearest min.)	44-18	44-18	44-20	44-23	44-30	44-30	44-28	44-26	44-24	43-31	43-18	43-17	43-21	43-20	43-22
Longitude (to nearest min.)	67-31	67-29	67-28	67-28	67-16	67-20	67-26	67-31	67-35	68-17	68-29	68-32	68-37	68-40	68-43
Water depth (meters)	102	102	101	49	79	55	55	79	75	183	174	192	165	139	110
Total number birds (transect only)	0	7	0	2	0	2	0	0	0	0	3	0	1	0	1
Area Sampled (km^2)	0.46	0.46	0.74	0.74	0.65	0.93	0.83	0.74	0.46	1.67	0.65	0.83	1.11	1.11	1.30
Density (Birds/km^2)	0.00	15.22	0.00	2.70	0.00	2.15	0.00	0.00	0.00	0.00	4.62	0.00	0.90	0.00	0.77
Species	Number Observed														
Northern Fulmar F.A.										0				0	
Tot.										1				1	
Gannet F.A.															
Tot.															
Common Eider F.A.		6.		1				0							
tot.		6		1				2							
Oldsquaw F.A.						2									
Tot.						2									
Great Black-backed Gull F.A.		1		1							3		0		0
Tot.		1		1							11		1		3
Herring Gull F.A.	0	0	0	0	0	0	0	0	0			0	0	0	1
tot.	11	3	1	3	3	1	1	1	5			2	3	1	2
Unidentified large alcid F.A.													1		
Tot.													1		

TABLE 6. Summary of Transect or Station Census Data.

Sl USCGC DECISIVE Observers K.D. Powers

Transect ☑ Station ☐ No.	031	032	033	034	035	036	037	038	039	040
Date(GMT)	3/31	3/31	4/1	4/1	4/1	4/1	4/1	4/1	4/1	4/2
Region*	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	GOM	NC
Latitude(to nearest min.)	43-23	43-27	43-13	43-11	43-08	43-00	42-45	42-45	42-43	42-10
Longitude(to nearest min.)	68-42	68-39	69-38	69-44	69-50	69-52	69-24	69-27	69-33	70-07
Water depth(meters)	110	101	137	137	174	205	157	192	238	47
Total number transect birds	0	2	1	0	3	1	6	8	0	7
Area Sampled(km^2)	1.30	1.30	1.02	1.02	0.83	0.83	0.46	0.83	0.83	0.37
Density (Birds/km^2)	0.00	1.54	0.98	0.00	3.61	1.20	13.04	9.64	0.00	2.59
Species	Number Observed									
Northern Fulmar F.A.	0					1	3	7		
Tot.	2					1	4	7		
Gannet F.A.				0						1
Tot.				2						1
Common Eider F.A.										
Tot.										
Great Black-backed Gull F.A.		2	0	0	0		1			5
Tot.		3	3	2	1		1			5
Herring Gull F.A.	0	0	1	0	3		2	1	0	1
Tot.	1	1	5	3	5		3	4	4	1

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 3 - 13 April 1978

Cruise No. 7807

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Galen L. Pittman, Staff Biologist, aboard the R/V ALBATROSS IV from 3 - 13 April 1978. The objective of the cruise was to conduct the spring ground fish survey in waters of mid-Atlantic, southern New England and southern Georges Bank. 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, in addition to Linda Despres, Chief Scientist, and the scientific crew for their assistance aboard ship. Special thanks are given to John Nicolas, NMFS, for his assistance in identifying marine mammals. Finally, acknowledgement is extended to H. C. Boyar, Vessel Coordinator for NMFS, for arranging passage aboard ship, and DOE, 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 visibilits 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 2 a-d indicates the distribution of four bird species using the greatest total count of each species per 10-minute square latitude/longitude block surveyed.

Approximately 40 percent of the transects were conducted in sight of land, often as close as 2.5 km of the coastline. The close proximity to shore was the primary factor contributing to the large number of sightings of inshore species such as loons, Ring-billed Gulls and Laughing Gulls, a Horned Grebe and some alcids (Table 3). Also, on April 6 - 8 approximately 1500 sea ducks, mainly three species of scoters and old squaws, were observed.

Kittiwakes were recorded in low numbers in Southern New England waters and were virtually absent on the Georges Bank counts. Alcids were widespread in low numbers. White-winged gulls were infrequent and no jaegars

or skuas were observed. Phalaropes were generally seen far off-shore and only south of 40°00'N. A few small flocks of unidentified storm-petrels were recorded in slope waters south of Nantucket Island. Single Sooty Shearwaters were observed at 39°37'N, 72°41'W and at 40°35'N, 69°02'W.

Gannets (98.5% adults) and Great Black-backed Gulls were present in 58 percent and 60 percent, respectively, of the total bird counts (both tended to be absent nearest shore). Fulmars were recorded in 23 percent of the total counts, being found primarily on Georges Bank and slope waters south of Long Island. Herring Gulls were widespread throughout the areas surveyed being recorded in 88 percent of the counts.

A large localized concentration of birds composed primarily of Herring Gulls plus the other three species just previously mentioned was associated with a Russian fishing fleet on the southeast part of Georges Bank. Counts made in the midst of the fleet and at a point 5 km away indicated a dramatic decrease (ten-fold) in birds present as we moved away from the fleet.

TABLE 1.

Seabird Density in Selected Regions Using Fixed Area Transects,

3 - 13 April 1978

Region	Number of Transects	Total Km^2 Surveyed (Tkm^2)	Total Birds (TB)	Mean Density (TB/Tkm^2)	Density Range (TB/Km^2/Transect)
Southern New England	53	52.34	280	5.35	0.00 - 63.04
South Coastal	14	13.79	204	14.79	0.00 - 63.08
Georges Bank	12	9.16	92	10.04	0.00 - 103.57
Middle Atlantic	4	4.36	9	2.06	0.00 - 7.21
Off Continental Shelf	1	1.02	8	7.84	

Cruise No. 7807

TABLE 2.

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

3 - 13 April 1978

Species	Southern New England	South Coastal	Georges Bank	Middle Atlantic	Off Continental Shelf
Common Loon	7			1	
Unidentified Loon		2			
Northern Fulmar	22		8		
Sooty Shearwater	1				
Gannet	58	1	17		3
Surf Scoter		12			
Common Scoter		5			
Unidentified Scoter		125		7	
Unidentified Duck		40			
Red Phalarope	1				
Unidentified Phalarope	19				
Ring-billed Gull		2			
Herring Gull	95	13	12	1	3
Great Black-backed Gull	46	1	5		
Glaucous Gull	1				
Laughing Gull		2			
Black-legged Kittiwake	2				2
Unidentified Gull	16	1	50		
Dovekie	1				
Unidentified Murre	1				
Unidentified Small Alcid	3				
Unidentified Large Alcid	3				
Unidentified Alcid	1				

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

3 - 13 April 1978

Species	Number	Date	Location	Remarks
Common Loon	1	4-3	41°17'N,70°53'W	Escaping GBBG
Common Loon	1	4-6	39°33'N,74°07'W	Flying S.
Common Loon	1	4-6	39°38'N,73°38'W	
Common Loon	1	4-7	40°32'N,73°35'W	Sitting
Sooty Shearwater	1	4-5	39°37'N,72°41'W	Ship following (SF)
Sooty Shearwater	1	4-11	40°35'N,69°02'W	Flying
Unidentified Storm Petrel	6	4-11	39°57'N,69°31'W	Milling near ship
Unidentified Storm Petrel	25	4-11	40°00'N,69°30'W	Flying E in flock
Great Cormorant (?)	9	4-10	41°06'N,70°44'W	Flying NE
Red Phalarope	1	4-5	39°52'N,72°44'W	Flushed by ship
Northern Phalarope	1	4-5	39°20'N,72°20'W	Surface flying
Unidentified Phalarope	4	4-5	39°22'N,72°17'W	Flying S
Unidentified Phalarope	1	4-5	39°19'N,72°21'W	
Unidentified Phalarope	11	4-5	39°18'N,72°22'W	Surface flying
Unidentified Phalarope	1	4-5	39°41'N,72°42'W	
Unidentified Phalarope	3	4-5	39°52'N,72°44'W	Flushed by ship
Unidentified Phalarope	11	4-6	39°29'N,74°08'W	Flying
Unidentified Phalarope	40	4-11	40°23'N,69°15'W	Flying NW in flock
Ring-billed Gull	1	4-8	40°33'N,72°03'W	SF
Ring-billed Gull	2	4-8	40°48'N,72°26'W	Circling ship

Cruise No. 7807

TABLE 3 (continued)

Species	Number	Date	Location	Remarks
Glaucous Gull	1	4-8	40°33'N,72°03'W	Flying
Iceland Gull	1	4-5	39°27'N,72°31'W	SF
Iceland Gull	1	4-10	40°41'N,70°17'W	SF
Laughing Gull	1	4-5	39°34'N,72°40'W	SF
Laughing Gull	3	4-6	39°27'N,74°09'W	SF
Laughing Gull	2	4-6	39°38'N,73°42'W	Flying
Laughing Gull	3	4-6	39°42'N,73°51'W	SF
Black-legged Kittiwake	2	4-4	40°07'N,71°16'W	SF
Black-legged Kittiwake	4	4-4	40°01'N,71°13'W	SF
Black-legged Kittiwake	2	4-4	39°52'N,71°36'W	Meandering
Black-legged Kittiwake	1	4-11	40°05'N,69°26'W	
Dovekie	3	4-11	40°34'N,69°03'W	Flushed by ship
Unid. Murre	1	4-4	39°59'N,71°21'W	Flying S
Unid. small Alcid	2	4-3	40°51'N,71°01'W	Flying
Unid. small Alcid	3	4-10	41°08'N,70°30'W	Flying NNW
Unid. large Alcid	3	4-3	40°49'N,71°01'W	Flying
Unid. large Alcid	1	4-4	40°01'N,71°13'W	Diving
Unid. large Alcid	3	4-8	40°36'N,72°10'W	Flying N
Unid. Alcid	1	4-8	40°36'N,72°10'W	Flying N
Unid. Alcid	3	4-13	40°21'N,68°39'W	Flushed--flying SW

TABLE 4.

List of Marine Mammal Sightings,

3 - 13 April 1978

Species	Number	Date	Location	Remarks
Possible Pilot Whale	1	4-4	39°58'N,71°31'W	Surfacing
Pilot Whale	10	4-4	39°55'N,71°35'W	"Bumping" trawl net
Pilot Whale	1	4-4	39°48'N,71°44'W	Surfacing
Pilot Whale	4	4-5	39°20'N,72°21'W	Surfacing
Unid. Rorqual	1	4-9	40°50'N,71°21'W	Surfacing
Unid. Whale	1	4-9	40°54'N,71°22'W	Surfacing
Unid. Whale	1	4-10	41°06'N,70°44'W	Surfacing
Common Dolphin	15	4-11	39°56'N,69°21'W	Circled bow

TABLE 5.

List of Non-Marine Bird Sightings,

3 - 13 April 1978

Species	Number	Date	Location	Remarks
Brown-headed Cowbird	1	4-4	39°51'N,71°40'W	On ship for at least 5 days
Common Flicker	1	4-5	39°24'N,72°16'W	Circling ship
Dark-eyed Junco	1	4-7	40°20'N,73°54'W	On ship
Common Grackle	1	4-8	40°32'N,72°53'W	On ship
Wood Duck	2	4-8	40°48'N,72°27'W	Pair flushed by ship
Redwing Blackbird	1	4-9	40°38'N,71°45'W	On ship
Brown-headed Cowbird	4	4-11	40°07'N,69°34'W	Two pair, on ship
Song Sparrow	1	4-11	40°07'N,69°34'W	On ship
Dark-eyed Junco	1	4-11	40°24'N,69°30'W	On ship
Belted Kingfisher	1	4-12	40°40'N,67°50'W*	On ship

* Location to 10-minute latitude/longitude block only

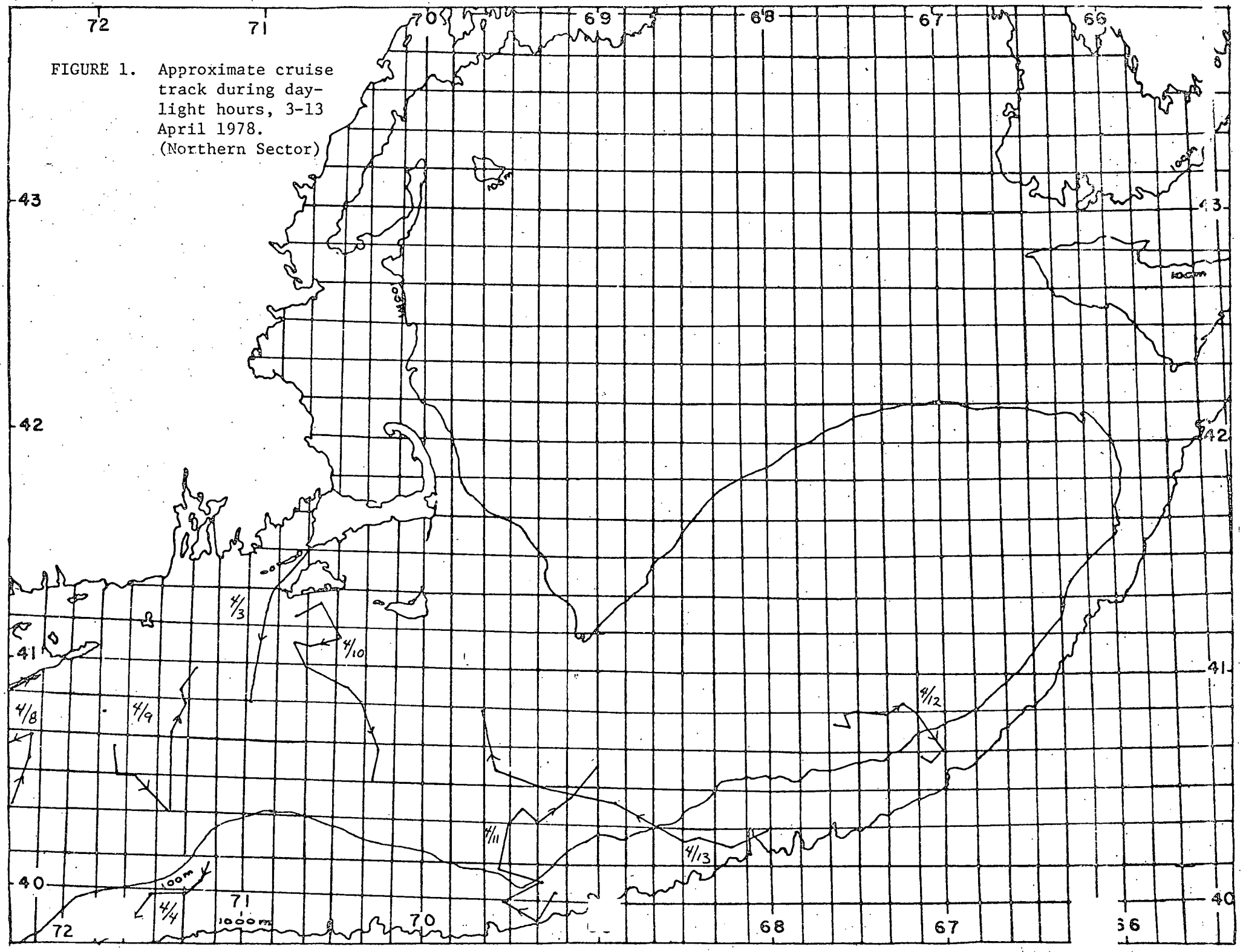

FIGURE 1. Approximate cruise track during daylight hours, 3-13 April 1978. (Northern Sector)

Cruise No. 7807

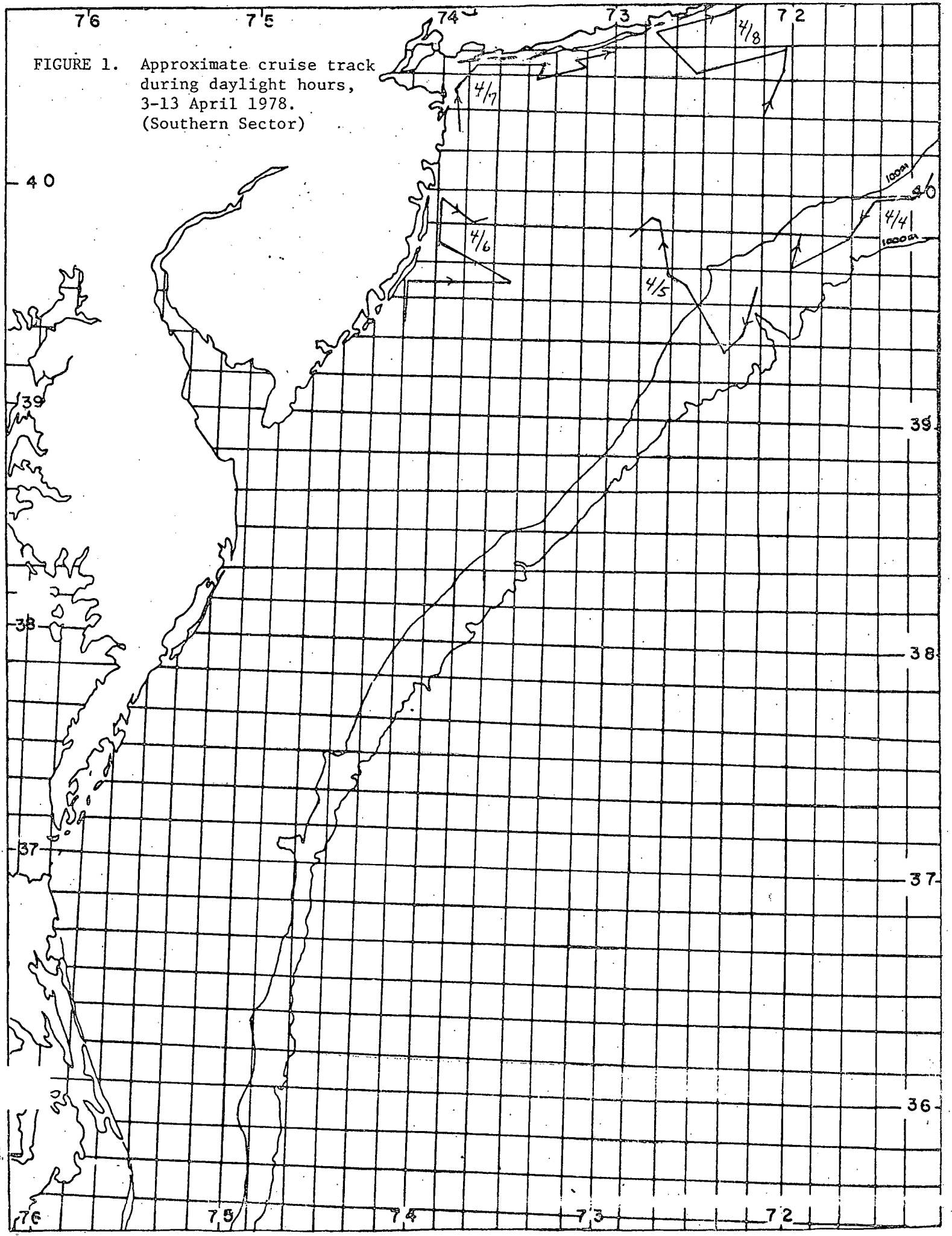

FIGURE 1. Approximate cruise track during daylight hours, 3-13 April 1978. (Southern Sector)

Cruise No. 7807

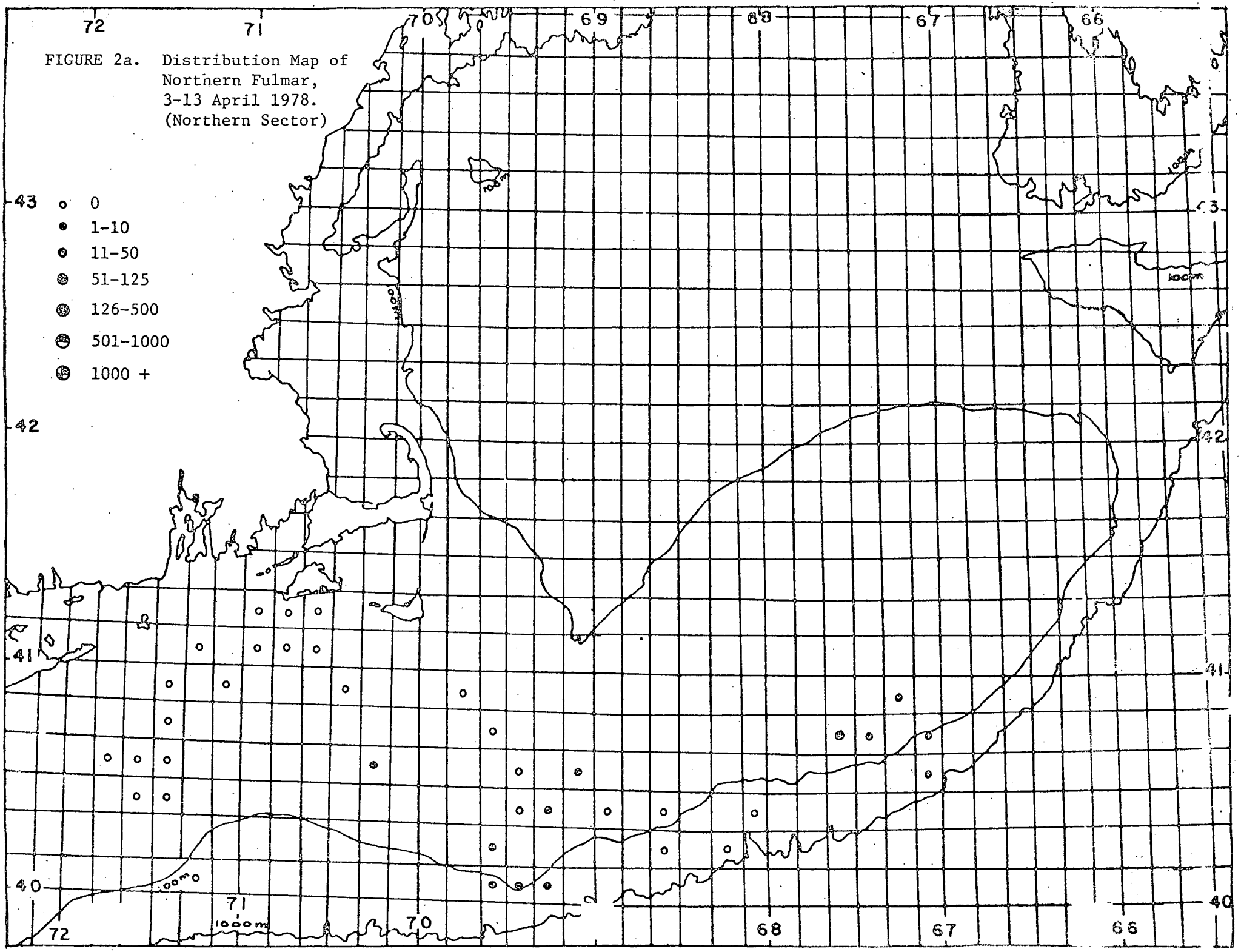

FIGURE 2a. Distribution Map of Northern Fulmar, 3-13 April 1978. (Northern Sector)

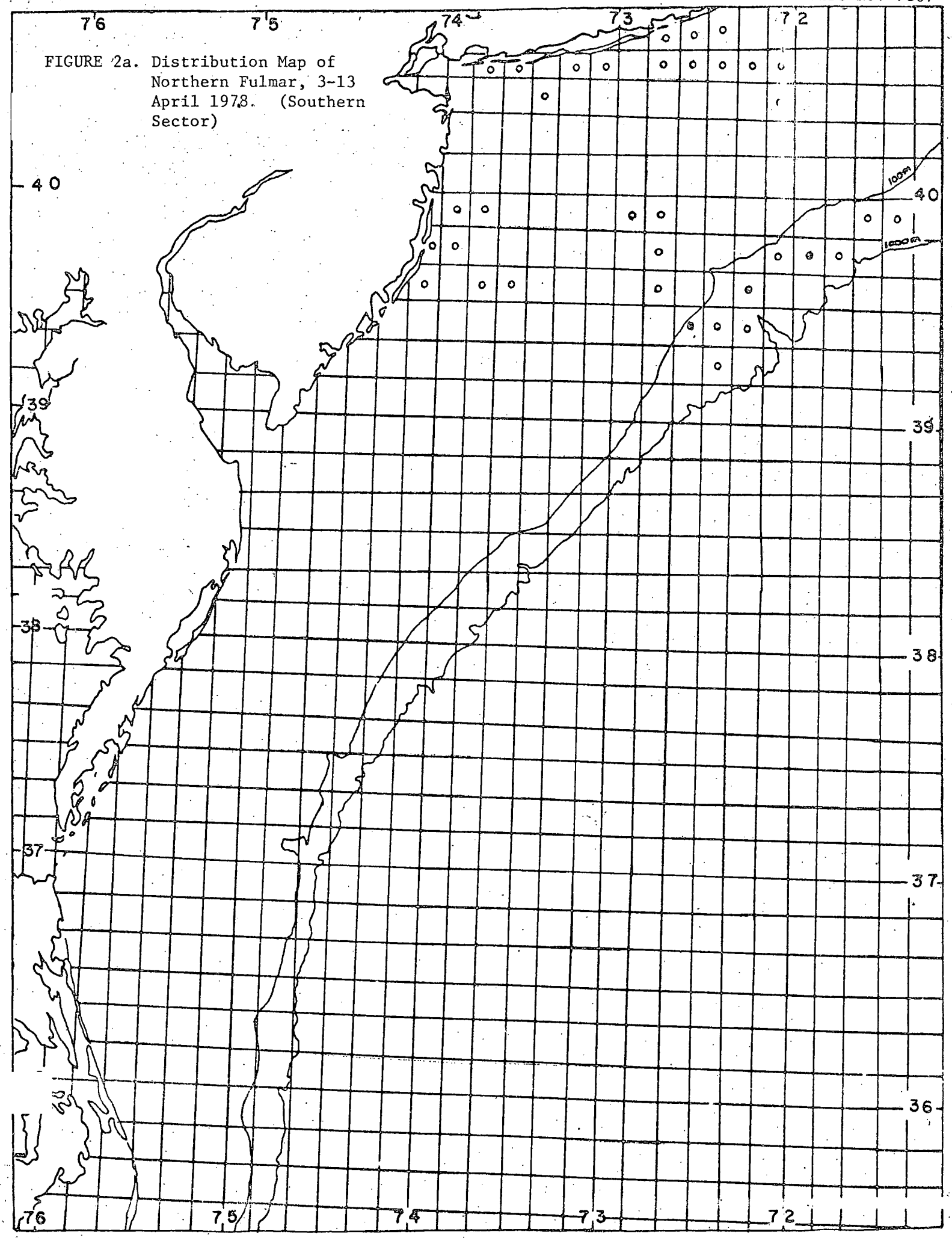

FIGURE 2a. Distribution Map of Northern Fulmar, 3-13 April 1978. (Southern Sector)

Cruise No. 7807

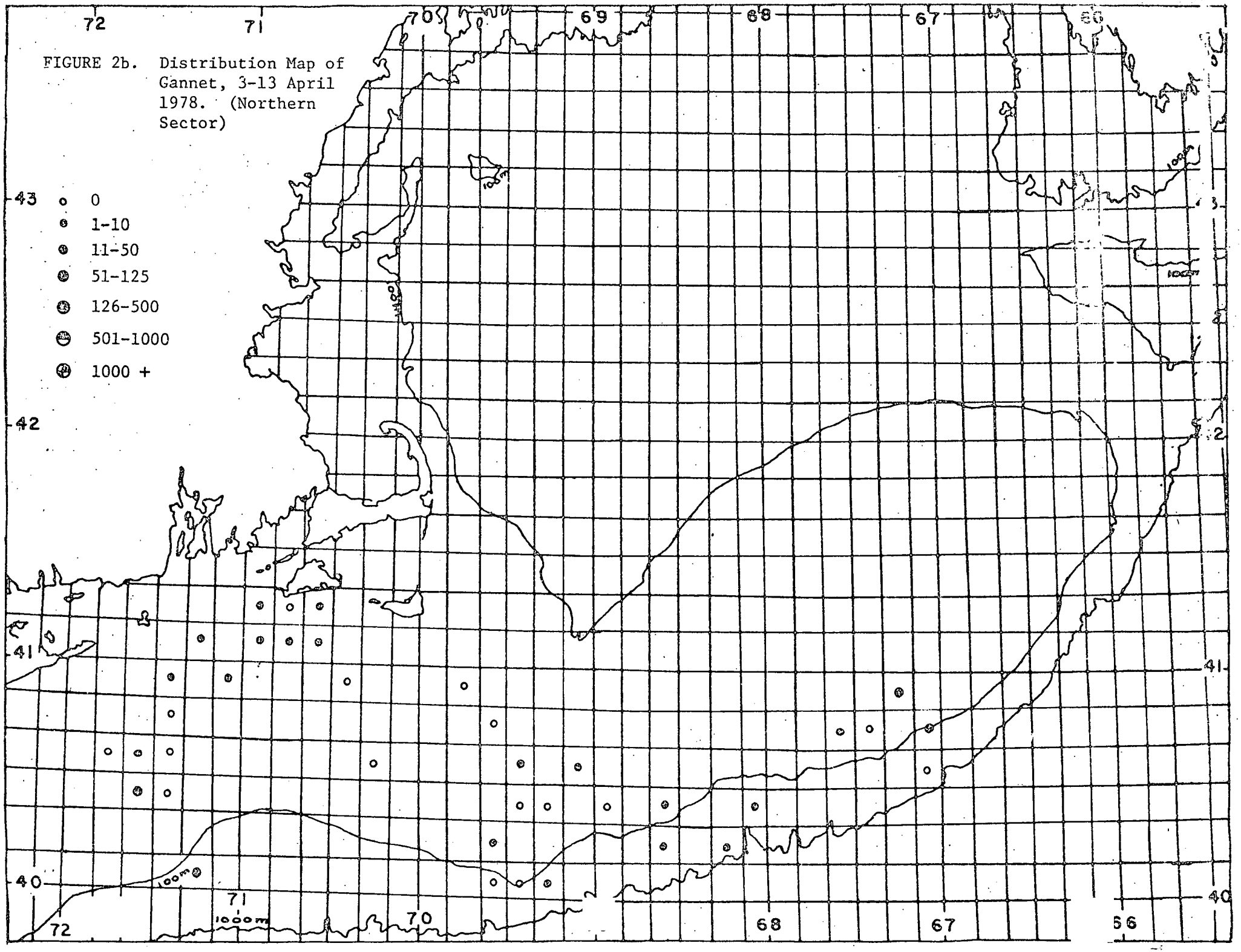

FIGURE 2b. Distribution Map of Gannet, 3-13 April 1978. (Northern Sector)

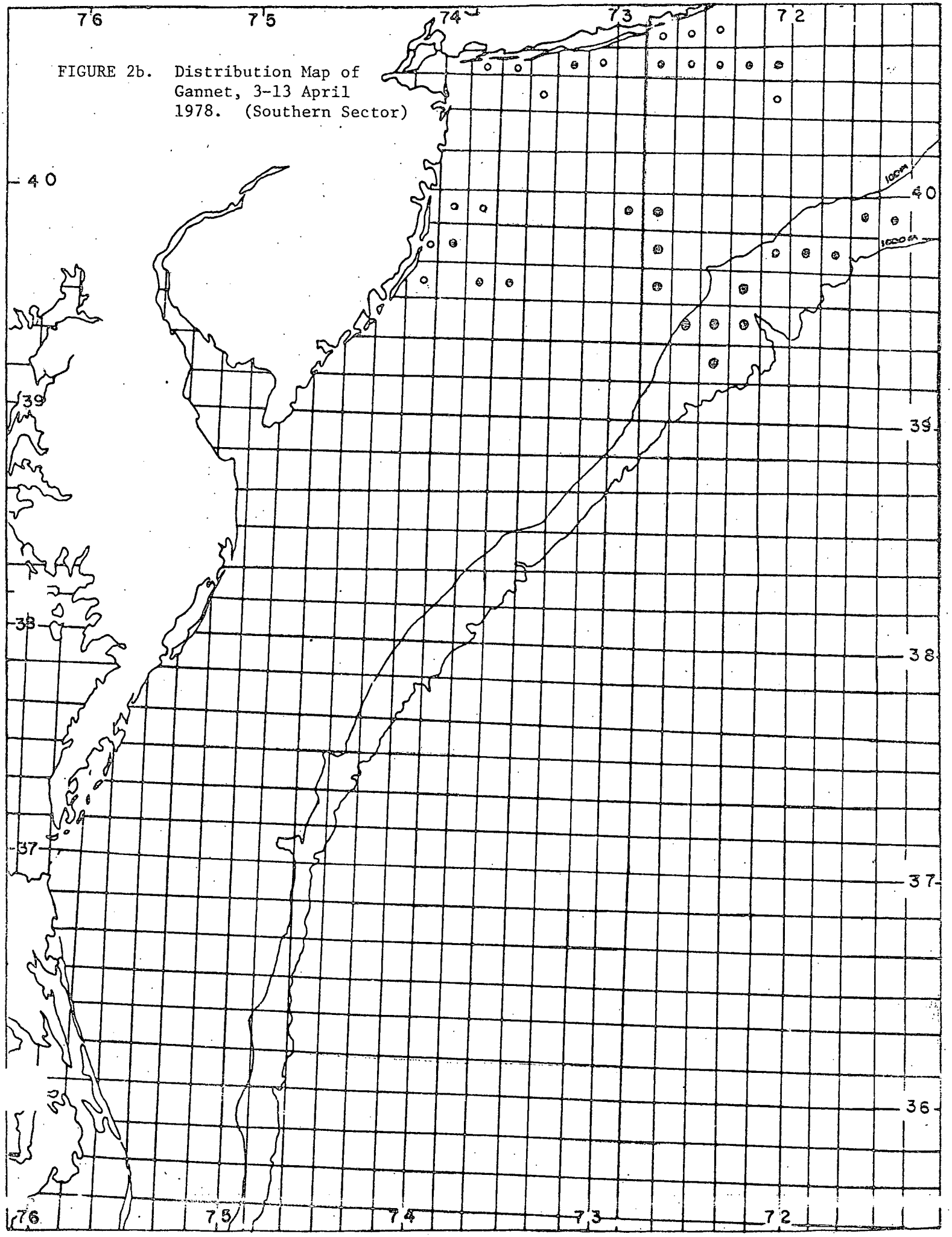

FIGURE 2b. Distribution Map of Gannet, 3-13 April 1978. (Southern Sector)

Cruise No. 7807

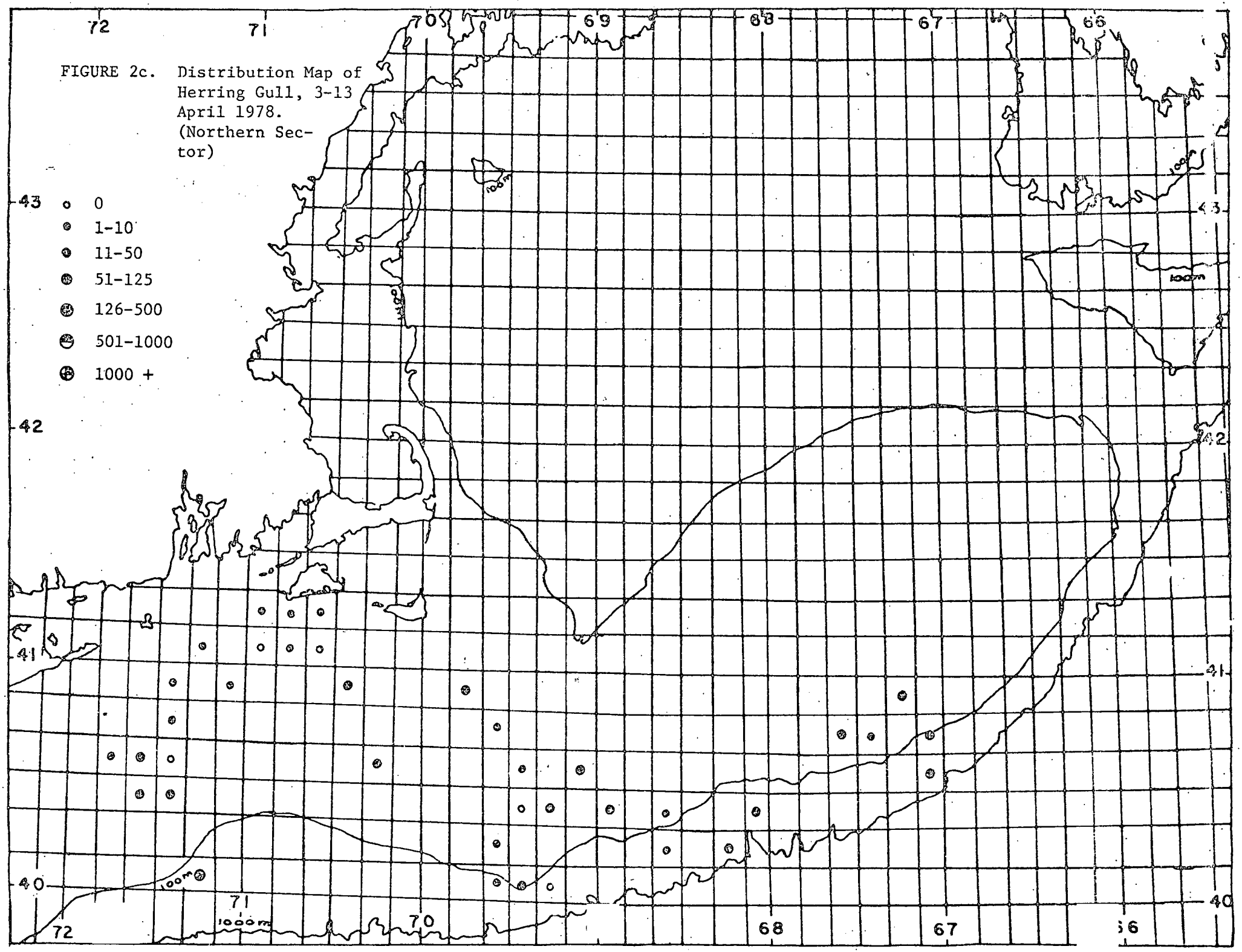

FIGURE 2c. Distribution Map of Herring Gull, 3-13 April 1978. (Northern Sector)

Cruise No. 7807

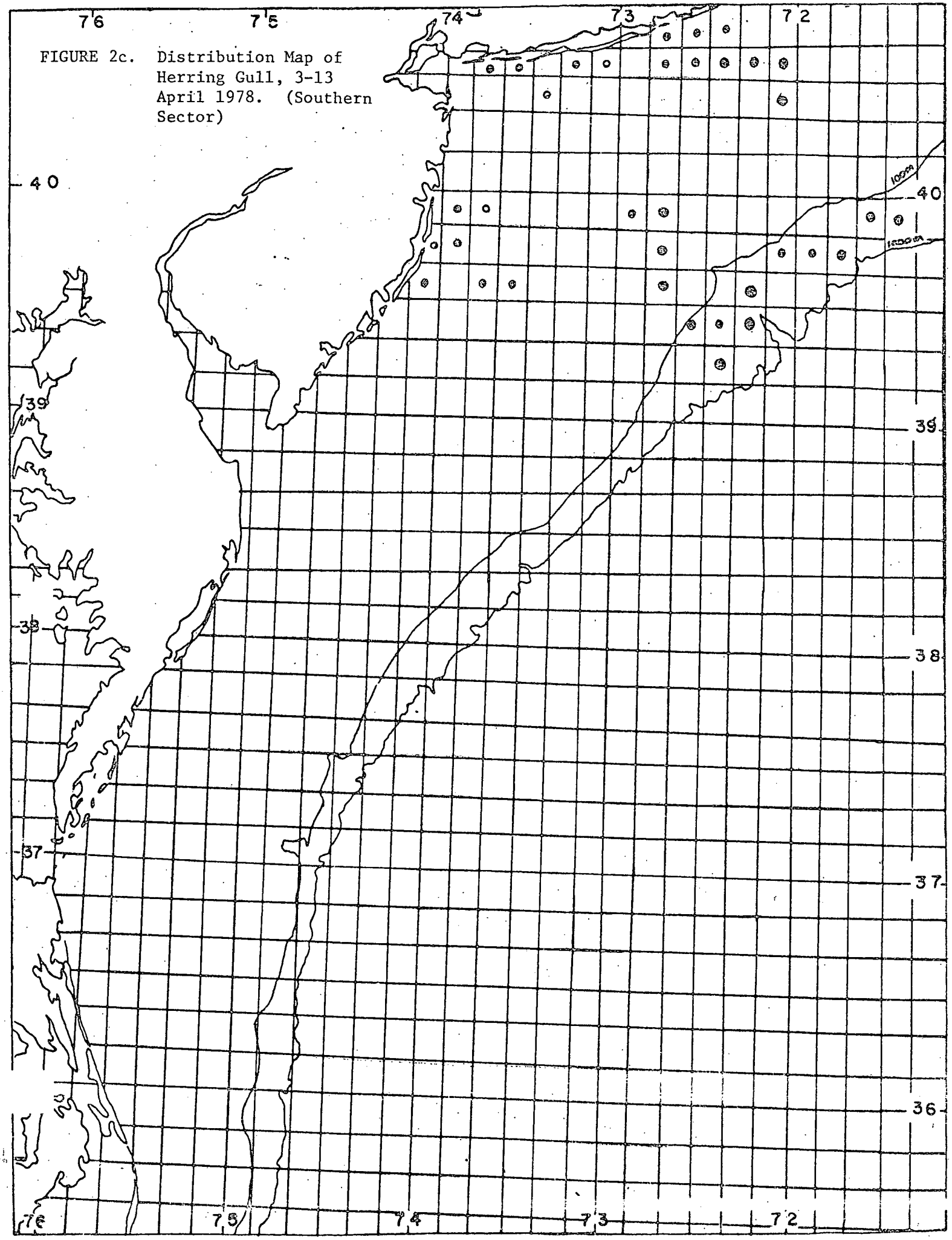

FIGURE 2c. Distribution Map of Herring Gull, 3-13 April 1978. (Southern Sector)

Cruise No. 7807

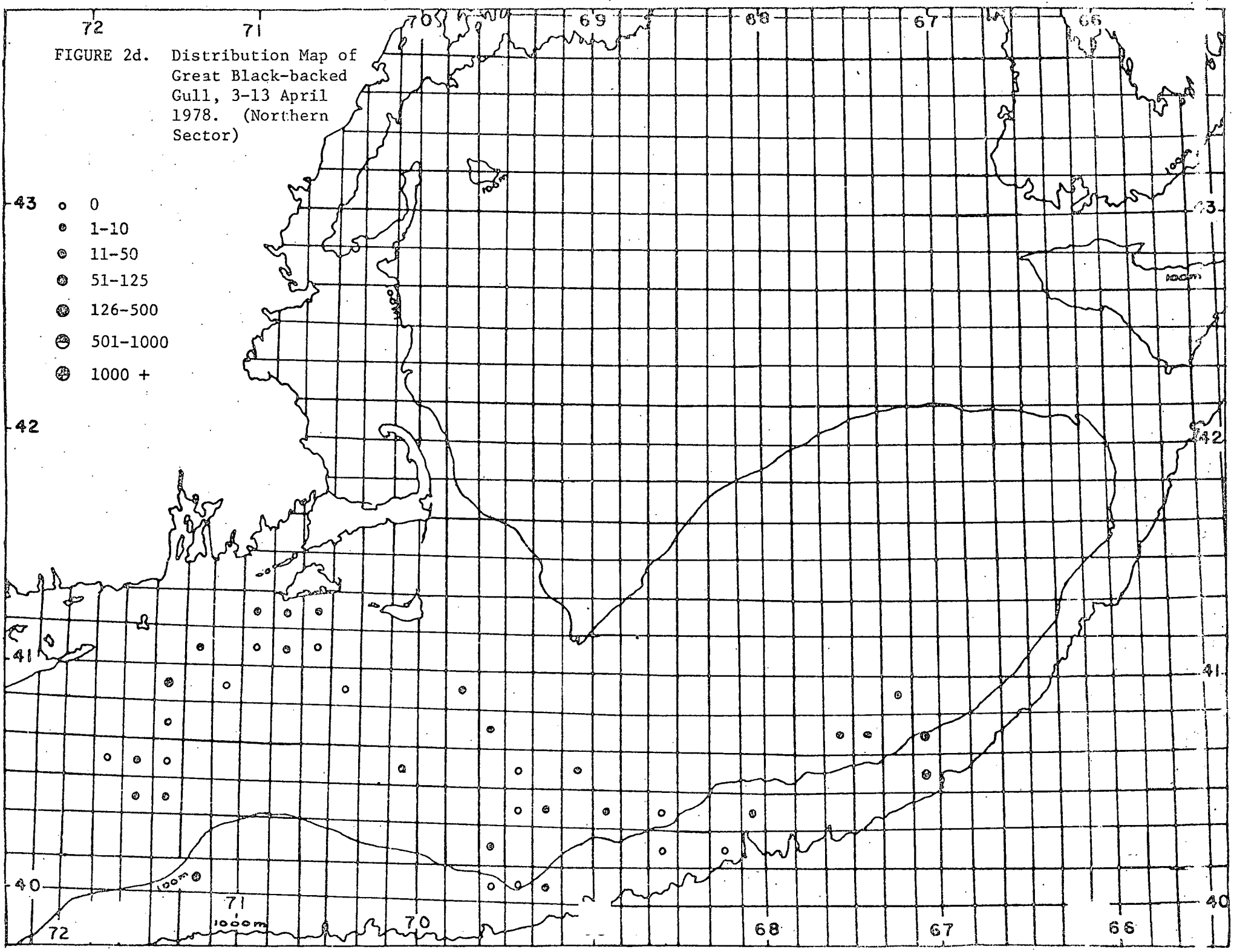

FIGURE 2d. Distribution Map of Great Black-backed Gull, 3-13 April 1978. (Northern Sector)

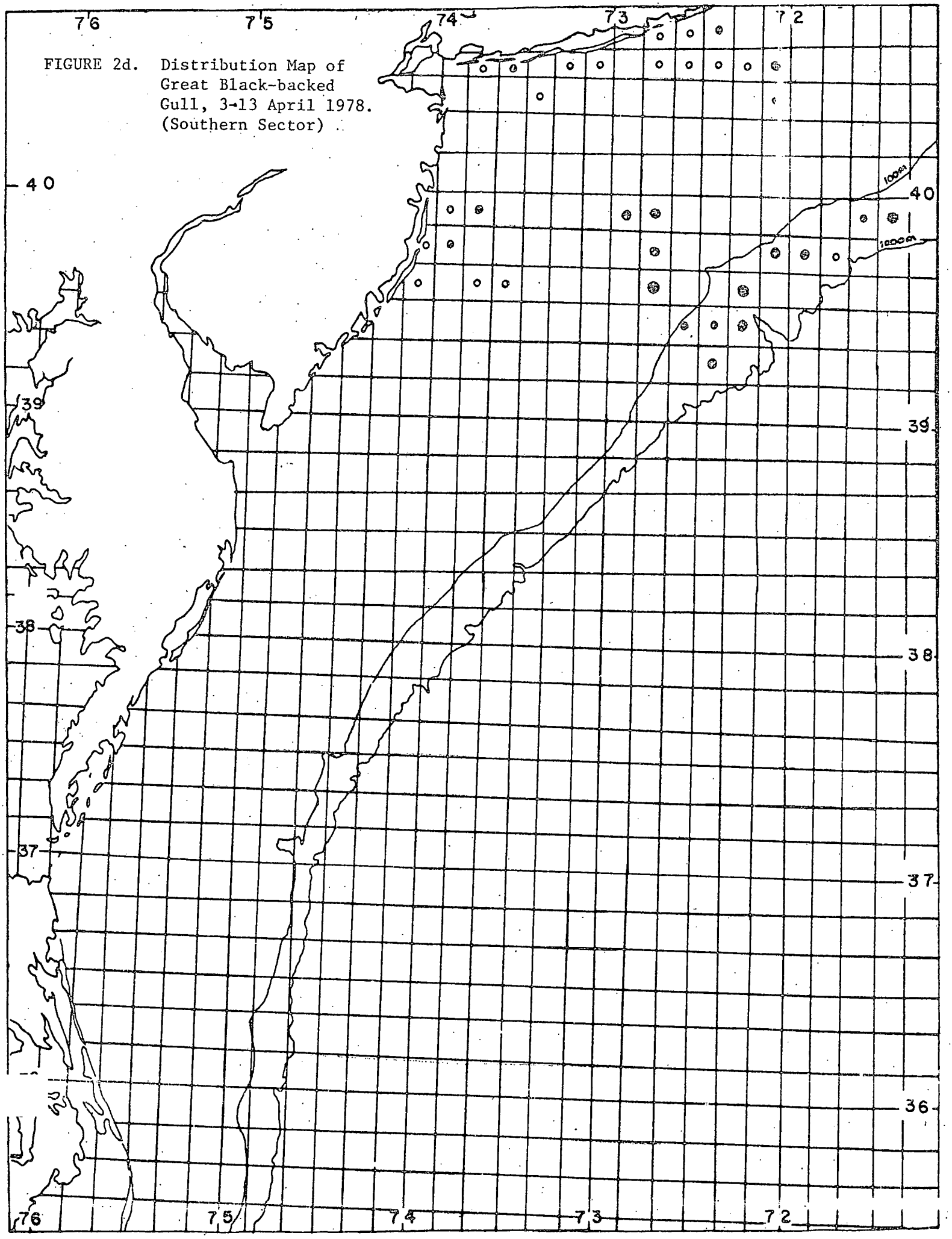

FIGURE 2d. Distribution Map of Great Black-backed Gull, 3-13 April 1978. (Southern Sector)

Cruise No. 7807

TABLE 6. Summary of Transect or Station Census Data.

Sl ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	1		2		3		4		5		6		7	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	3		3		3		3		3		4		4	
Region*	SNE		SNE		SNE		SNE		SNE		SNE		SNE	
Latitude(to nearest min.)	41-17		41-13		41-07		41-01		40-56		40-02		39-59	
Longitude(to nearest min.)	70-53		70-57		70-57		70-59		71-00		71-17		71-21	
Water depth(meters)	29		27		31		44		51		154		148	
Number of Birds	3	(5)	2	(5)	8	(12)	0	(12)	3	(3)	7	(118)	4	(42)
Area Sampled(km^2)	1.11		1.07		1.10		1.11		1.11		1.11		1.11	
Birds per km^2	2.70		1.87		7.27		0.00		2.70		6.31		3.60	
Species	Number Observed													
Common Loon	0	(1)			7	(7)	0	(11)						
Gannet	2	(2)	1	(3)	1	(5)			2	(2)	7	(12)	0	(3)
Herring Gull	1	(1)	1	(2)					1	(1)	0	(65)	2	(12)
Great Black-backed Gull	0	(1)									0	(41)	1	(26)
Unidentified Gull							0	(1)						
Unidentified Murre													1	(1)

TABLE 6. Summary of Transect or Station Census Data.

Sh ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	8		9		10		11		12		13		14	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	4		4		4		4		5		5		5	
Region*	SNE		OO		SNE		SNE		SNE		SNE		SNE	
Latitude(to nearest min.)	39-52		39-48		39-41		39-48		39-31		39-22		39-18	
Longitude(to nearest min.)	71-36		71-44		72-00		71-57		72-14		72-17		72-22	
Water depth(meters)	329		560		161		146		375		207		165	
Number of Birds	6	(26)	8	(30)	11	(26)	12	(36)	4	(164)	6	(106)	14	(219)
Area Sampled(km^2)	1.07		1.02		1.07		1.02		1.07		0.65		0.65	
Birds per Km^2	5.61		7.84		10.28		11.76		3.74		9.23		21.54	
Species	Number Observed													
Northern Fulmar							1	(1)	1	(1)				
Gannet	2	(9)	3	(10)	3	(10)	2	(10)	3	(33)	0	(23)	1	(46)
Unidentified Phalarope											4	(4)	11	(11)
Herring Gull	3	(12)	3	(19)	5	(5)	4	(19)	0	(65)	2	(52)	1	(76)
Great Black-backed Gull	0	(4)			3	(11)	5	(16)	0	(65)	0	(27)	1	(46)
Black-legged Kittiwake	1	(1)	2	(2)										
Unidentified Gull													0	(40)

TABLE 6. Summary of Transect or Station Census Data.

S: ALBATROSS IV Observers Galen L. Pittman

Transect ☐ Station ☐ No.	15		16		17		18		19		20		21	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	5		5		5		5		5		5		6	
Region*	SNE		SNE		SNE		SNE		SNE		SNE		SC	
Latitude(to nearest min.)	39-21		39-27		39-39		39-41		39-52		39-51		39-34	
Longitude(to nearest min.)	72-22		72-31		72-41		72-42		72-44		72-51		74-06	
Water depth(meters)	146		717		69		71		55		55		15	
Number of Birds	0	(52)	11	(64)	4	(160)	1	(104)	4	(86)	9	(41)	15	(144)
Area Sampled(km²).	0.65		0.70		0.97		0.97		1.02		0.65		1.11	
Birds per km²	0.00		15.71		4.12		1.03		3.92		13.85		13.51	
Species	Number Observed													
Northern Fulmar			1	(1)										
Sooty Shearwater					0	(1)	0	(1)						
Gannet	0	(22)	5	(27)	3	(28)	0	(27)	0	(12)	8	(9)		
Surf Scoter													1	(1)
C mon Scoter													5	(5)
Unidentified Scoter													8	(135)
Red Phalarope									1	(1)				
Unidentified Phalarope							1	(1)	3	(3)				
Herring Gull	0	(9)	1	(26)	0	(20)	0	(25)	0	(25)	0	(6)	0	(1)
Great Black-backed Gull	0	(3)	4	(9)	1	(81)	0	(50)	0	(45)	1	(26)		
Iceland Gull			0	(1)										
Laughing Gull													1	(2)
Unidentified Gull	0	(20)			0	(30)								

TABLE 6. Summary of Transect or Station Census Data.

Sl ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	22		23		24		25		26		27		28	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	6		6		6		6		6		6		6	
Region*	MA		MA		MA		SC		SC		SC		MA	
Latitude(to nearest min.)	39-34		39-38		39-38		39-42		39-49		39-55		39-50	
Longitude(to nearest min.)	73-42		73-38		73-42		73-51		74-00		73-58		73-48	
Water depth(meters)	22		31		22		22		15		16		24	
Number of Birds	8	(11)	1	(7)	0	(11)	55	(62)	41	(193)	0	(4)	0	(1)
Area Sampled(km²)	1.11		1.07		1.07		1.11		0.65		1.07		1.11	
Birds per km²	7.21		0.93		0.00		49.55		63.08		0.00		0.0	
Species	Number Observed													
Common Loon			1	(2)										
Unidentified Loon							2	(2)						
Gannet			0	(1)	0	(8)	0	(1)						
Oldsquaw									0	(2)				
S. & Scoter									1	(1)				
Unidentified Scoter	7	(7)					52	(52)						
Unidentified Duck									40	(190)				
Herring Gull	1	(2)	0	(4)	0	(1)	0	(4)			0	(3)		
Great Black-backed Gull							0	(1)					0	(1)
Laughing Gull					0	(2)	1	(2)						
Unidentified Gull	0	(2)									0	(1)		

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TABLE 6. Summary of Transect or Station Census Data.

Sl ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	29		30		31		32		33		34		35	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	7		7		7		7		7		7		8	
Region*	SC		SC		SC		SC		SC		SC		SNE	
Latitude(to nearest min.)	40-33		40-32		40-29		40-30		40-35		40-37		40-29	
Longitude(to nearest min.)	73-45		73-35		73-23		73-19		73-11		73-08		72-07	
Water depth(meters)	11		13		22		20		20		13		57	
Number of Birds	4	(3)	0	(9)	0	(0)	1	(9)	0	(8)	10	(27)	0	(48)
Area Sampled(km^2)	1.02		1.16		1.07		1.07		0.70		1.07		1.11	
Birds per km^2	3.92		0.00		0.00		0.93		0.00		9.35		0.00	
Species	Number Observed													
Common Loon			0	(1)										
Unidentified Loon							0	(7)						
Gannet									0	(3)			0	(1)
Unidentified seator											9	(9)		
Herring Gull	4	(4)	0	(5)			1	(1)	0	(4)			0	(42)
Great Black-backed Gull			0	(2)									0	(5)
Unidentified Gull	0	(4)	0	(1)			0	(1)	0	(1)	1	(18)		

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TABLE 6. Summary of Transect or Station Census Data.

Ship ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	36		37		38		39		40		41		42	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	8		8		8		8		8		8		8	
Region*	SNE		SNE		SNE		SNE		SNE		SNE		SC	
Latitude(to nearest min.)	40-33		40-37		40-36		40-35		40-32		40-37		40-45	
Longitude(to nearest min.)	72-03		72-02		72-10		72-21		72-35		72-40		72-42	
Water depth(meters)	51		49		46		42		38		33		15	
Number of Birds	8	(59)	1	(64)	5	(22)	1	(11)	5	(5)	2	(5)	2	(44)
Area Sampled(km^2)	1.11		1.02		1.02		1.02		1.07		1.07		0.65	
Birds per km^2	7.21		0.98		4.90		0.98		4.67		1.87		3.08	
Species	Number Observed													
Unidentified Loon											0	(1)		
Gannet	3	(3)	1	(1)	0	(2)								
Unidentified Scoter													0	(40)
Ring-billed Gull	0	(1)												
Herring Gull	4	(44)	0	(46)	1	(16)	1	(11)	5	(5)	2	(2)	2	(4)
Greater Black-backed Gull			0	(17)										
Glaucous Gull	1	(1)												
Unidentified Gull	0	(10)									0	2		
Unidentified Large Alcid					3	(3)								
Unidentified Alcid					1	(1)								

TABLE 6. Summary of Transect or Station Census Data.

Sh ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	43		44		45		46		47		48		49	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	8		8		9		9		9		9		9	
Region*	SC		SC		SNE		SNE		SNE		SNE		SNE	
Latitude(to nearest min.)	40-48		40-48		40-31		40-30		40-27		40-21		40-34	
Longitude(to nearest min.)	72-33		72-26		71-46		71-37		71-35		71-27		71-28	
Water depth(meters)	11		18		60		75		77		71		66	
Number of Birds	61	(103)	9	(78)	0	(12)	7	(27)	3	(56)	25	(26)	0	(0)
Area Sampled(km²)	1.02		1.02		1.07		1.07		1.07		1.07		1.07	
Birds per Km²	5980		8.82		0.00		6.54		2.80		23.36		0.00	
Species	Number Observed													
Unidentified Loon	0	(1)												
Gannet							7	(7)	0	(20)				
Oldsquaw					0	(3)								
Surf Scoter	10	(10)												
C non Scoter			0	(25)										
Unidentified Scoter	50	(90)	6	(46)										
Unidentified Duck					0	(3)								
Ring-billed Gull			2	(2)										
Herring Gull	1	(2)	0	(1)	0	(6)	0	(15)	1	(16)	18	(19)		
Great Black-backed Gull			1	(1)			0	(5)	1	(4)	7	(7)		
Unidentified Gull			0	(3)					1	(16)				

TABLE 6. Summary of Transect or Station Census Data.

S ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	50		51		52		53		54		55		56	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	9		9		9		9		10		10		10	
Region*	SNE		SNE		SNE		SNE		SNE		SC		SNE	
Latitude(to nearest min.)	40-44		40-50		40-54		41-00		41-13		41-14		41-08	
Longitude(to nearest min.)	71-25		71-21		71-22		71-19		70-45		70-35		70-30	
Water depth(meters)	59		57		55		44		27		22			
Number of Birds	2	(4)	0	(47)	16	(20)	6	(15)	5	(17)	6	(18)	3	(5)
Area Sampled(km^2)	1.11		1.11		0.74		0.74		1.07		1.07		1.07	
Birds per km^2	1.80		0.00		21.62		8.11		4.67		5.61		2.80	
Species	Number Observed													
Gannet					2	(2)	0	(3)			1	(1)	0	(1)
Unidentified Scoter			0	(12)										
Unidentified Duck											0	(3)		
Herring Gull	2	(2)	0	(2)	2	(2)	0	(6)	3	(5)	5	(6)		
G ~~&~~ Black-backed Gull	0	(2)	0	(17)	2	(6)	6	(6)	2	(2)	0	(5)		
Unidentified Gull			0	(16)	10	(10)			0	(10)			0	(1)
Unidentified Small Alcid													3	(3)
Unidentified Bird											0	(3)		

TABLE 6. Summary of Transect or Station Census Data.

Sh ALBATROSS IV Observers Galen L. Pitman

Transect ☒ Station ☐ No.	57		58		59		60		61		62		63	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	T	WT	TOT
Date(GMT) April 1978	10		10		10		10		11		11		11	
Region*	SNE		SNE		SNE		SNE		SNE		SNE		SNE	
Latitude(to nearest min.)	41-06		41-01		40-53		40-39		40-02		39-56		40-05	
Longitude(to nearest min.)	7040		7041		70-27		70-17		69-15		69-21		69-26	
Water depth(meters)	42		44		46		49		124		293		101	
Number of Birds	7	(9)	1	(6)	4	(13)	1	(17)	5	(5)	6	(6)	29	(29)
Area Sampled(km^2)	1.07		0.83		1.11		1.11		1.11		1.11		0.46	
Birds per km^2	6.54		1.20		3.60		0.90		4.50		5.41		63.04	
Species	Number Observed													
Northern Fulmar							1	(1)	2	(2)	4	(4)	8	(8)
Gannet			0	(1)					1	(1)	1	(1)		
Herring Gull	6	(6)	0	(4)	4	(13)	0	(15)			1	(1)	16	(16)
Great Black-back Gull	1	(1)	1	(1)			0	(1)	2	(2)			4	(4)
Bl-Legged Kittiwake													1	(1)
Unidentified Gull	0	(2)												

TABLE 6. Summary of Transect or Station Census Data.

Sl ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	64		65		66		67		68		69		70	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	11		11		11		11		11		12		12	
Region*	SNE		SNE		SNE		SNE		SNE		GB		GB	
Latitude(to nearest min.)	40-09		40-13		40-25		40-27		40-35		40-46		40-49	
Longitude(to nearest min.)	69-36		69-33		69-27		69-10		69-02		67-32		67-34	
Water depth(meters)	91		82		69		79		73		79		75	
Number of Birds	1	(5)	11	(14)	1	(1)	6	(42)	5	(35)	6	(78)	0	(25)
Area Sampled(km^2)	0.46		1.11		1.02		1.07		1.02		0.70		0.74	
Birds per Km^2	2.17		9.91		0.98		5.61		4.90		8.57		0.00	
Species	Number Observed													
Norther Fulmar	0	(1)	1	(1)			5	(5)	0	(3)	5	(20)	0	(10)
Sooty Shearwater									1	(1)				
Gannet			1	(1)					2	(3)	1	(7)	0	(2)
Herring Gull	1	(4)	7	(9)			0	(20)	0	(26)	0	(40)	0	(11)
G - Black-backed Gull			2	(3)			0	(6)	1	(2)	0	(1)	0	(2)
Unidentified Gull					1	(1)	0	(10)			0	(10)		
Dovekie							1	(1)						

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TABLE 6. Summary of Transect or Station Census Data.

S ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	71		72		73		74		75		76		77	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	12		12		12		12		12		12		13	
Region*	GB		GB		GB		GB		GB		GB		GB	
Latitude(to nearest min.)	40-49		40-53		40-47		40-43		40-40		40-37		40-20	
Longitude(to nearest min.)	67-21		67-18		67-06		67-06		67-04		67-08		68-06	
Water depth(meters)	90		82		93		99		143		179		176	
Number of Birds	2	(6)	1	(34)	3	(26)	12	(32)	58	(53)	1	(61)	2	(42)
Area Sampled(km^2)	0.46		0.70		0.70		0.70		0.56		0.65		1.07	
Birds per Km^2	4.35		1.43		4.29		17.14		103.57		1.54		1.87	
Species	Number Observed													
Northern Fulmar	0	(2)	0	(1)	1	(1)	0	(1)	1	(4)	1	(1)		
Gannet			0	(13)	1	(1)	3	(5)	5	(20)			2	(5)
Herring Gull	2	(2)	1	(18)	0	(23)	6	(11)	1	(38)	0	(24)	0	(22)
Great Black-backed Gull	0	(2)	0	(2)	1	(1)	3	(5)	1	(41)	0	(36)	0	(5)
Unidentified Gull							0	(10)	50	(550)			0	(10)

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TABLE 6. Summary of Transect or Station Census Data.

Ship ALBATROSS IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	78		79		80		81		82		83		84	
	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT	WT	TOT
Date(GMT) April 1978	13		13		13		13		13		13		13	
Region*	GB		GB		GB		SNE		SNE		SNE		SNE	
Latitude(to nearest min.)	40-16		40-18		40-20		40-26		40-31		40-40		40-50	
Longitude(to nearest min.)	68-18		68-31		68-33		68-55		69-28		69-39		69-41	
Water depth(meters)	256		91		99		79		59		48		35	
Number of Birds	2	(27)	2	(3)	3	(5)	1	(25)	0	23	0	(4)	4	(23)
Area Sampled(km^2)	1.02		0.93		0.93		0.93		0.97		1.07		1.02	
Birds per km^2	1.96		2.15		3.23		1.08		0.00		0.00		3.92	
Species	Number Observed													
Gannet	2	(2)	1	(2)	2	(2)			0	(1)				
Herring Gull	0	(25)	1	(1)	1	(3)	0	(17)	0	(22)	0	(3)	0	(15)
Great Black-backed Gull							1	(2)			0	(1)	0	(4)
Unidentified Gull							0	(6)					4	(4)

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 3 - 19 April 1978

Cruise No. 7808

INTRODUCTION

The following report summarizes bird and mammal observations made by Albert W. Nickerson, Staff Biologist, Manomet Bird Observatory, on continental shelf waters of New England aboard U. S. Coast Guard Cutter VIGILANT 3-19 April 1978. The mission of the Coast Guard patrol was off-shore law enforcement, search and rescue. The observer was aboard on a non-interference basis primarily to collect information on distribution, abundance, behavior and oiling of seabirds.

Manomet Bird Observatory gratefully acknowledges the cooperation of the U. S. Coast Guard for allowing an observer to join the patrol. The observer thanks Cmdr. Ian S. Cruickshank, the officers and crew of USCGC VIGILANT for their generous assistance aboard ship. Financial support for M.B.O. Seabird Studies is provided by the U. S. Department of Energy (DOE Contract No. EE-78-S-02-4706).

METHODS

Information was collected and put into four major field sets: event data, location data, environmental 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 4 knots or faster, and that visibility be at least 1 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, group size, 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-h indicate the distribution of six bird species and two species groups observed using the greatest total bird count of each species per 10-minute square latitude/longitude block surveyed.

The primary mission of the Coast Guard patrol was fisheries law enforcement, and seven of the sixteen days at sea were spent in or near "Fishing Area Five", near the Southeast part of Georges Bank (see Figure 1) where the Russian fleet was fishing. Large concentrations of fulmar, Gannets and Great Black-backed and Herring Gulls were observed in association with the trawlers. Flocks of several thousand fulmars and both large gull species, in addition to approximately 500 Gannets were recorded at 40°36'N, 67°07'W. Sightings in this area also included 15 Wilson's, Leach's and 8 unidentified storm-petrels, 7 Sooty Shearwaters and 1 Manx Shearwater.

Northern Fulmar was the most abundant and widely distributed species. Counts were highest in the vicinity of the Soviet fleets, and flocks of several hundred fulmars were recorded with fishing activities on the Northern edge, but this species was also seen in sections of Georges Bank where no fishing was in progress.

Razorbills, Common and Thick-billed Murres, and Common Puffins were sighted. Murres were distributed over most areas surveyed, but generally only 1-5 birds were recorded per sighting.

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TABLE 1.

Seabird Density in Selected Regions Using Fixed Area Transects
3 - 19 April 1978

Region	Number of Transects	Total Km^2 Surveyed (Tkm^2)	Total Birds (TB)	Mean Density (TB/Tkm^2)	Density Range (TB/Km^2/Transect)
Southern New England	16	14.57	32		0 - 23.66
Georges Bank	115	107.75	2787		0 - 958
Gulf of Maine	2	1.85	31	16.76	3.92 - 32.53
Southern Coastal	1	0.93	1	1.08	
Off Continental Shelf	5	5.19	114	21.96	0 - 32.37

Cruise No. 7808

TABLE 2.

Number of Birds per Species in Selected Regions (Using Fixed-area Transects Only)

3 - 19 April 1978

Species	Southern New England	Georges Bank	Gulf of Maine	Southern Coastal	Off Continental Shelf
Northern Fulmar	5	1341			22
Sooty Shearwater		1			
Wilson's Storm-Petrel		4			
Gannet	3	308			10
Phalarope Spp.			26		
Great Black-backed Gull	5	381			17
Herring Gull		661	2	1	4
Black-legged Kittiwake		27			1
Razorbill	1	2			
Common Murre		1			
Thick-billed Murre		12			
Murre Spp.		20	2		
Common Puffin		4	1		
Alcid Spp.	19	21			1

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

3 - 19 April 1978

Species	Number	Date	Location	Remarks
Sooty Shearwater	1	4-5	40°38'N,67°14'W	Flying
	1	4-5	40°33'N,67°36'W	Flying
	1	4-5	40°18'N,67°32'W	Flying near trawlers
	1	4-6	40°33'N,67°10'W	Flying near trawlers
	2	4-14	40°22'N,67°15'W	In fishing fleet
	1	4-15	40°41'N,67°06'W	In fishing fleet
Manx Shearwater	1	4-5	40°18'N,67°32'W	Flying near trawlers
Leach's Storm-Petrel	1	4-5	40°18'N,67°32'W	Flying alone
Wilson's Storm-Petrel	1	4-5	40°18'N,67°32'W	Flying
	5	4-15	40°41'N,67°06'W	In fishing fleet
	2	4-17	40°29'N,67°38'W	Flying
	7	4-17	40°27'N,67°42'W	Flying
Phalarope spp.	26	4-13	40°44'N,68°34'W	Sitting, flew
	2	4-13	40°40'N,68°26'W	Sitting, flew
Pomarine Jaeger	1	4-17	40°32'N,67°34'W	Ad., light phase
Glaucous Gull	1	4-13	41°25'N,69°35'W	First winter plumage
Iceland Gull	1	4-12	40°38'N,69°14'W	Flying
	1	4-12	40°36'N,69°17'W	Flying
	1	4-14	40°22'N,67°15'W	In fishing fleet
	1	4-18	40°36'N,67°33'W	Sitting

TABLE 3. (continued)

Species	Number	Date	Location	Remarks
Thick-billed Murre	1	4-7	40°57'N,67°40'W	Sitting
	1	4-14	40°22'N,67°15'W	In fishing fleet
	2	4-16	40°36'N,67°16'W	Sitting, dove
	7	4-17	40°29'N,67°38'W	Sitting, dove
	14	4-18	40°36'N,67°33'W	Sitting
Common Murre	1	4-11	41°11'N,67°08'W	Sitting, dove
	1	4-11	42°00'N,67°14'W	Sitting, dove
Razorbill	1	4-3	40°58'N,70°34'W	Sitting
	2	4-17	40°29'N,67°38'W	Traveling 130°
Common Puffin	2	4-7	41°10'N,67°02'W	Sitting
	1	4-13	40°44'N,68°34'W	Sitting, flew
	1	4-17	40°29'N,67°38'W	Sitting
	1	4-18	40°38'N,67°40'W	Adult, sitting, dove

TABLE 4.

List of Marine Mammal Sightings

Species	Number	Date	Location	Remarks
Unid. dolphin	2	4-3	41°03'N,70°44'W	Traveling S
Whale Spp.	3	4-4	40°17'N,68°25'W	Traveling SE together
Probable Humpback	1	4-10	41°25'N,67°07'W	Low, bushy spout 4X
Humpback Whale	1	4-10	41°25'N,67°07'W	Low, bushy spout--showed white on underside of flukes
Unid. dolphin	2	4-11	41°40'N,67°05'W	Traveling S
Whale Spp.	1	4-13	41°17'N,69°20'W	Low, bushing spout--once
Unid. dolphin	5	4-14	40°29'N,67°13'W	Traveling NE
Whale Spp.	1	4-17	40°31'N,67°10'W	Two spouts
Unid. dolphin	5	4-17	40°27'N,67°42'W	Traveling SE
Unid. dolphin	2	4-18	40°39'N,69°20'W	Still on surface, dorsal fin exposed

TABLE 5.

List of Non-Marine Bird Sightings

Species	Number	Date	Location	Remarks
White-winged Scoter	2	4-3	41°10'N,71°00'W	Traveling S
Common Flicker	1	4-5	40°17'N,67°31'W	Flying low
Starling	1	4-5	40°18'N,67°32'W	Flying S
Redwinged Blackbird	3	4-6	40°24'N,67°25'W	Flying N
Brown-headed Cowbird	2	4-7	41°10'N,69°02'W	Circling ship
Belted Kingfisher	1	4-8	41°45'N,68°16'W	Flying NE
Brown-headed Cowbird	1	4-8	41°45'N,68°16'W	On ship
Sparrow Spp.	1	4-8	41°47'N,68°18'W	Circling ship
Brown-headed Cowbird	2	4-10	41°40'N,67°03'W	On ship
Brown-headed Cowbird	7	4-11	42°01'N,67°03'W	On ship
Dark-eyed Junco	1	4-11	41°25'N,67°05'W	On ship
Glossy Ibis	1	4-12	40°28'N,69°26'W	On ship

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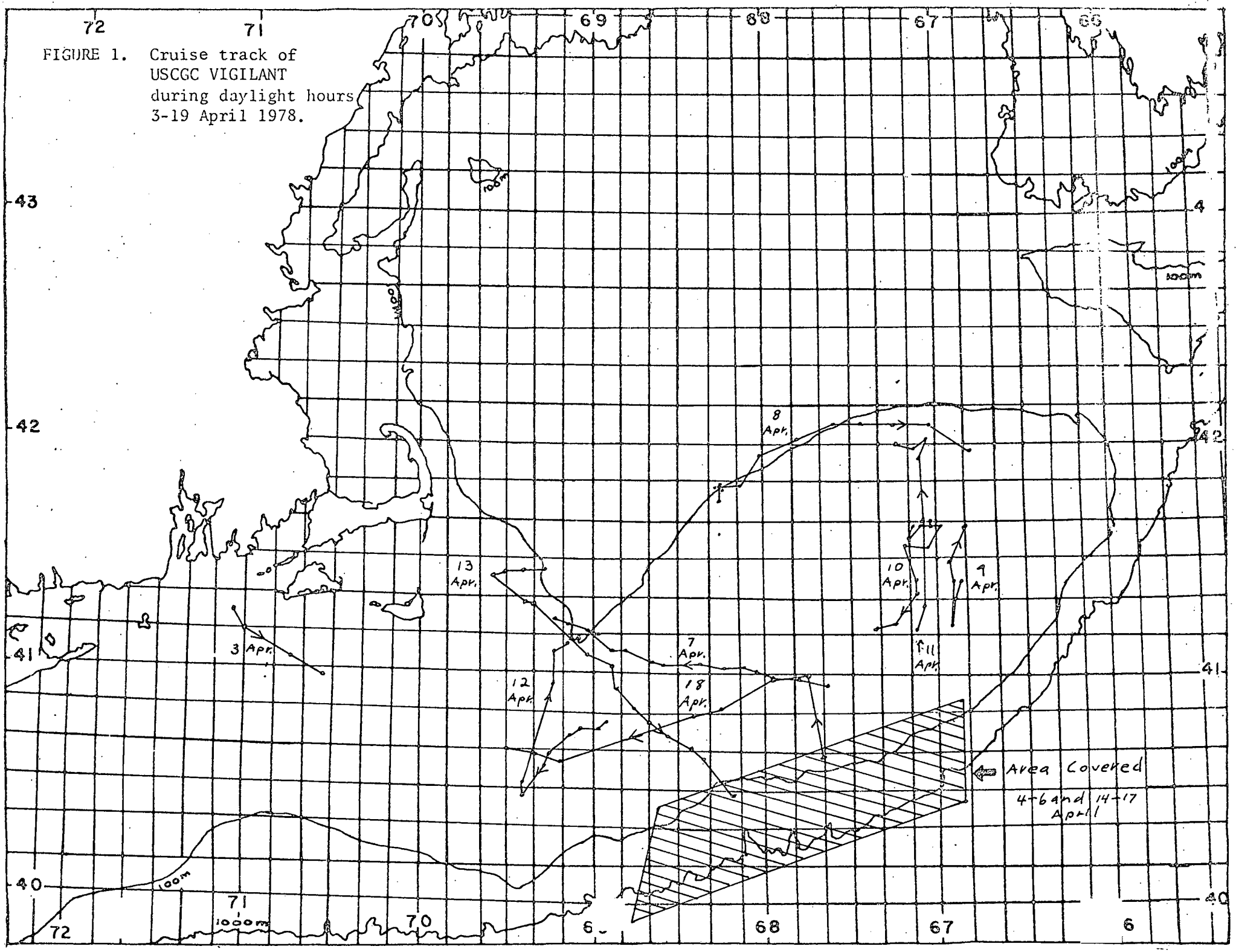

FIGURE 1. Cruise track of USCGC VIGILANT during daylight hours 3-19 April 1978.

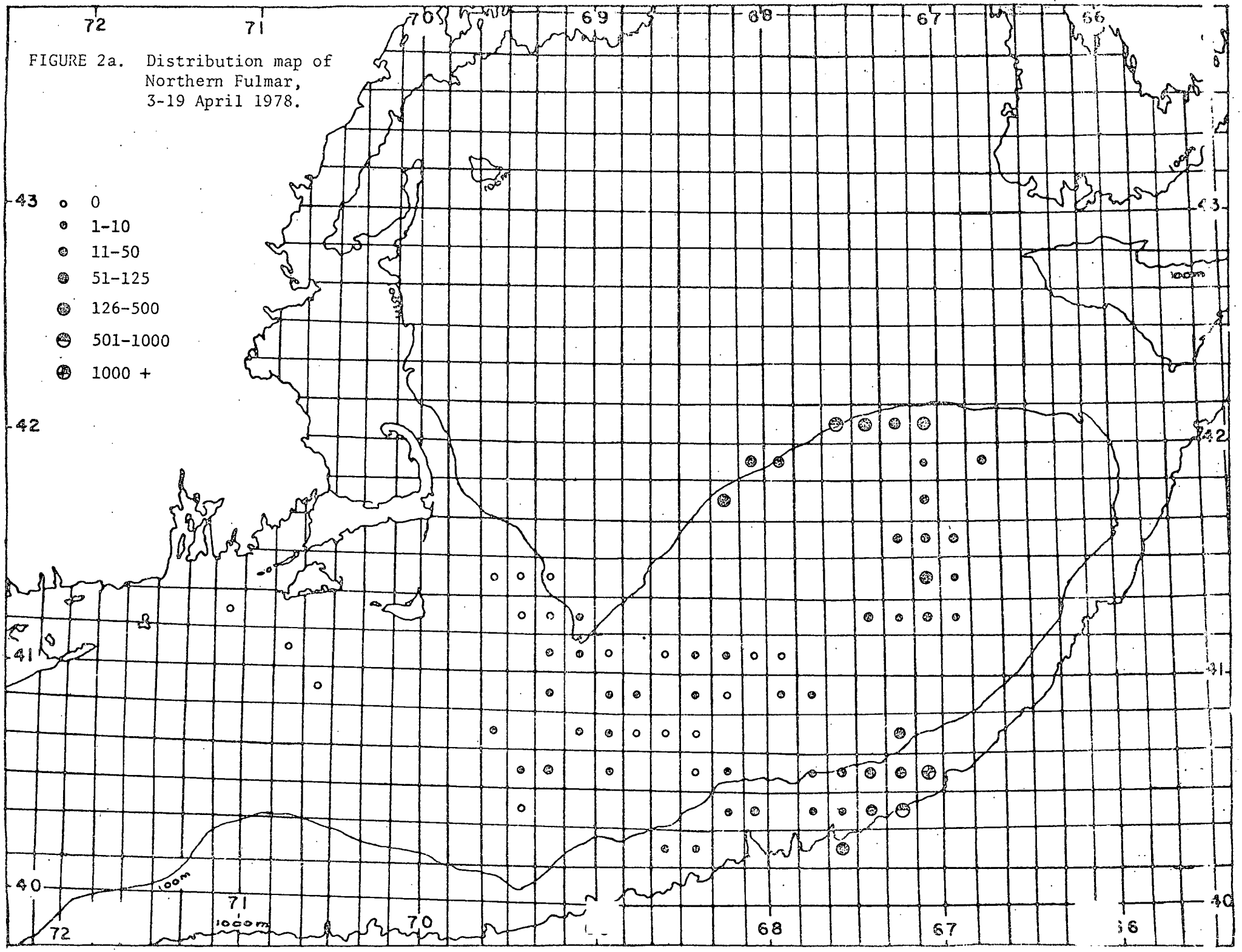

FIGURE 2a. Distribution map of Northern Fulmar, 3-19 April 1978.

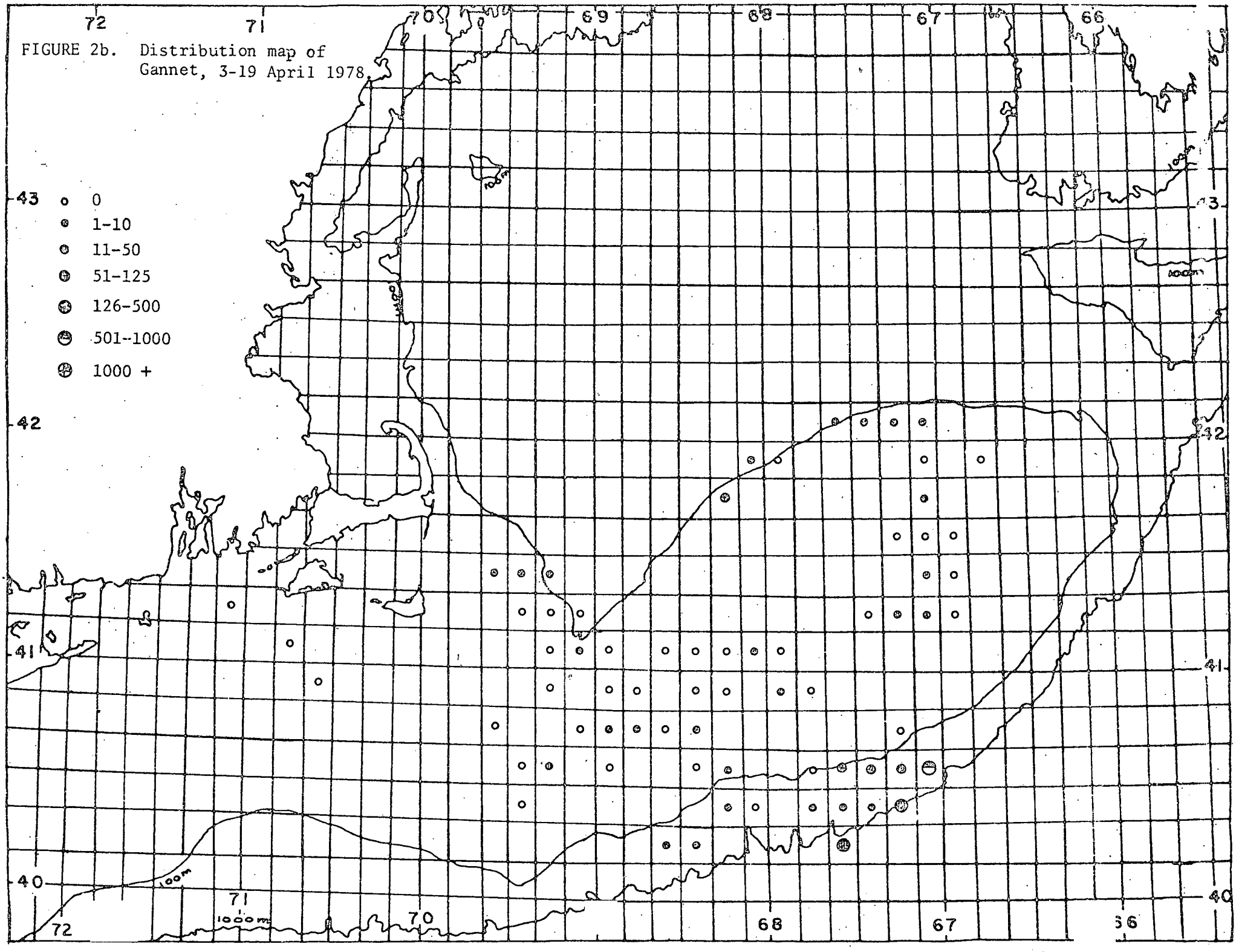

FIGURE 2b. Distribution map of Gannet, 3-19 April 1978.

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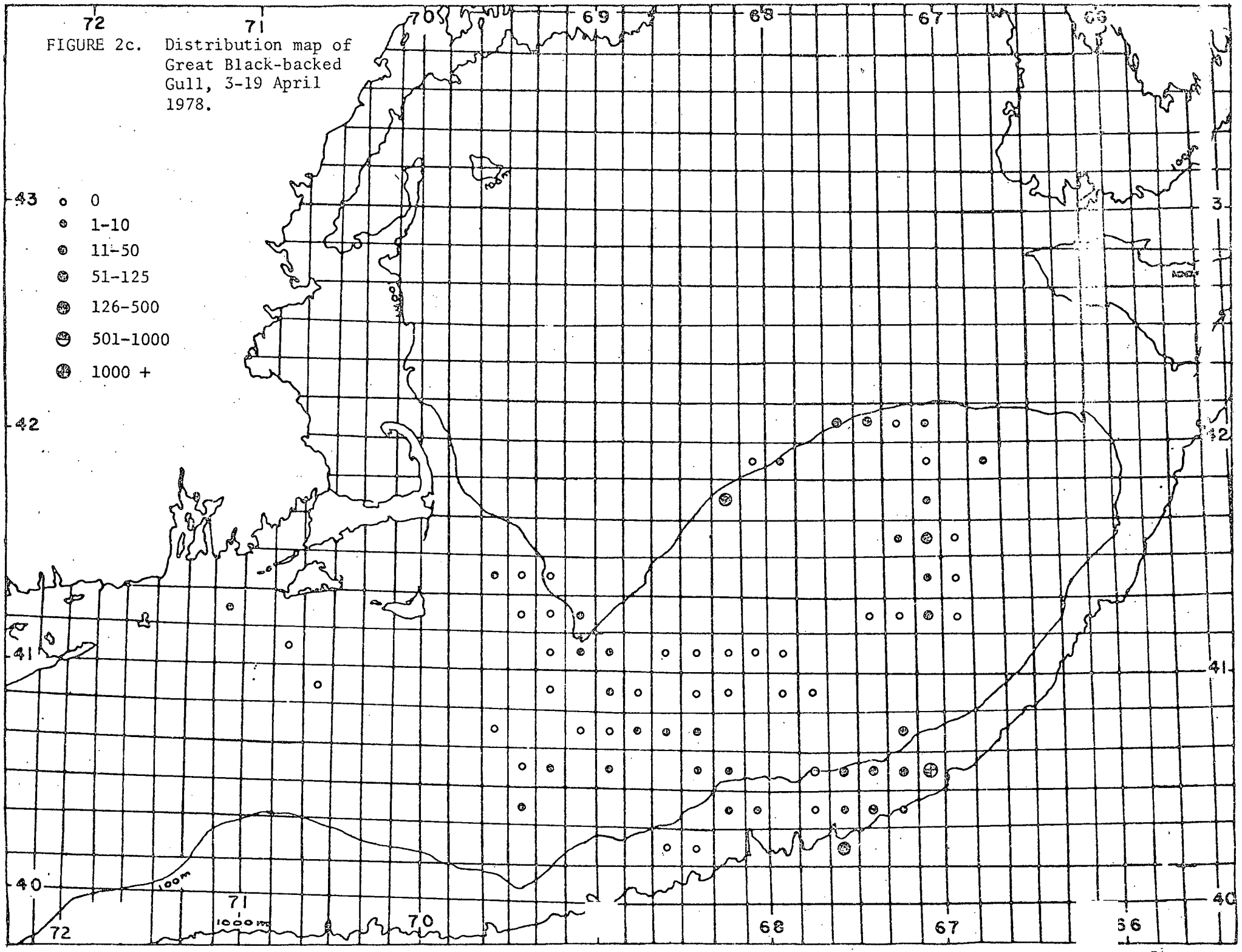

FIGURE 2c. Distribution map of Great Black-backed Gull, 3-19 April 1978.

Cruise No. 7808

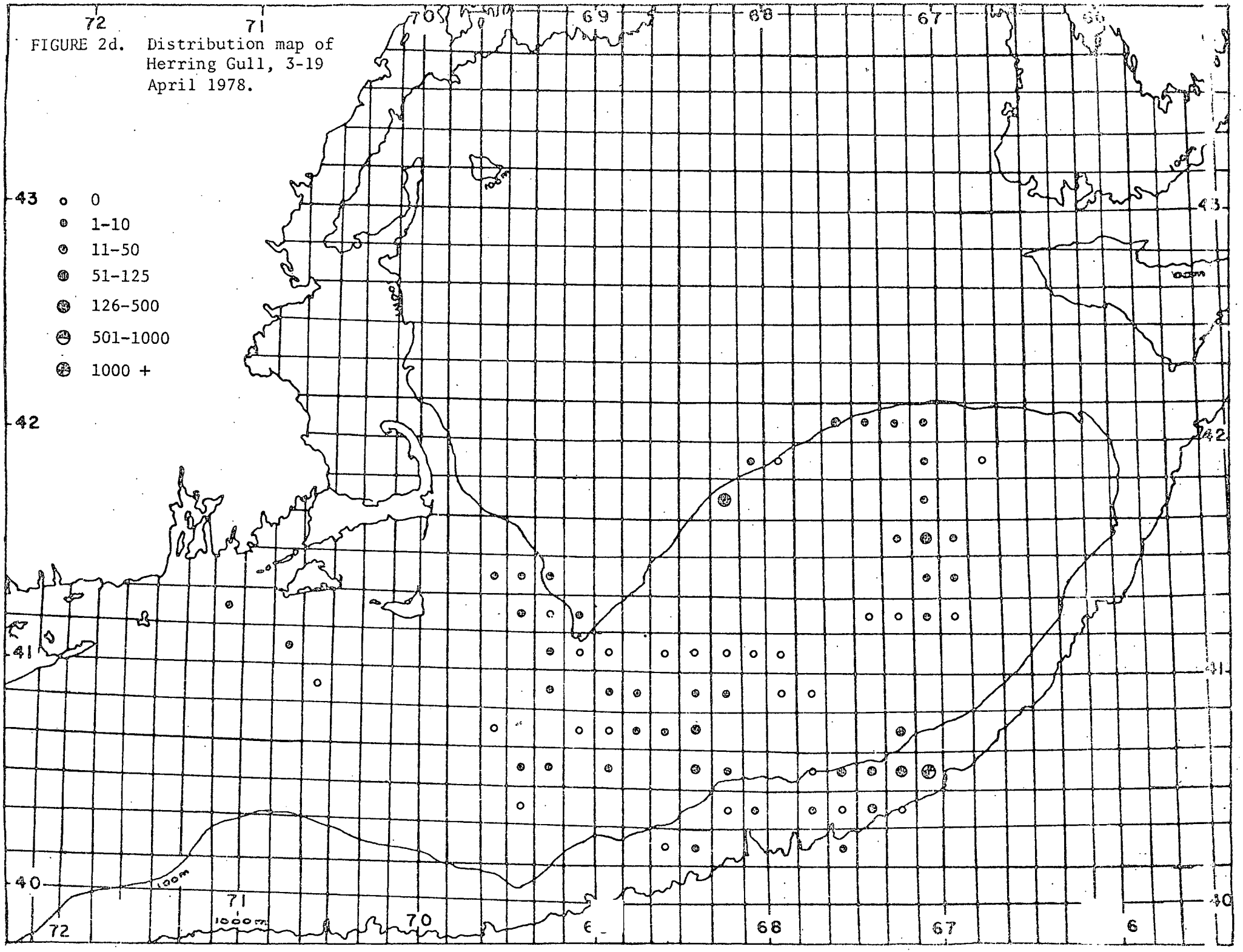

FIGURE 2d. Distribution map of Herring Gull, 3-19 April 1978.

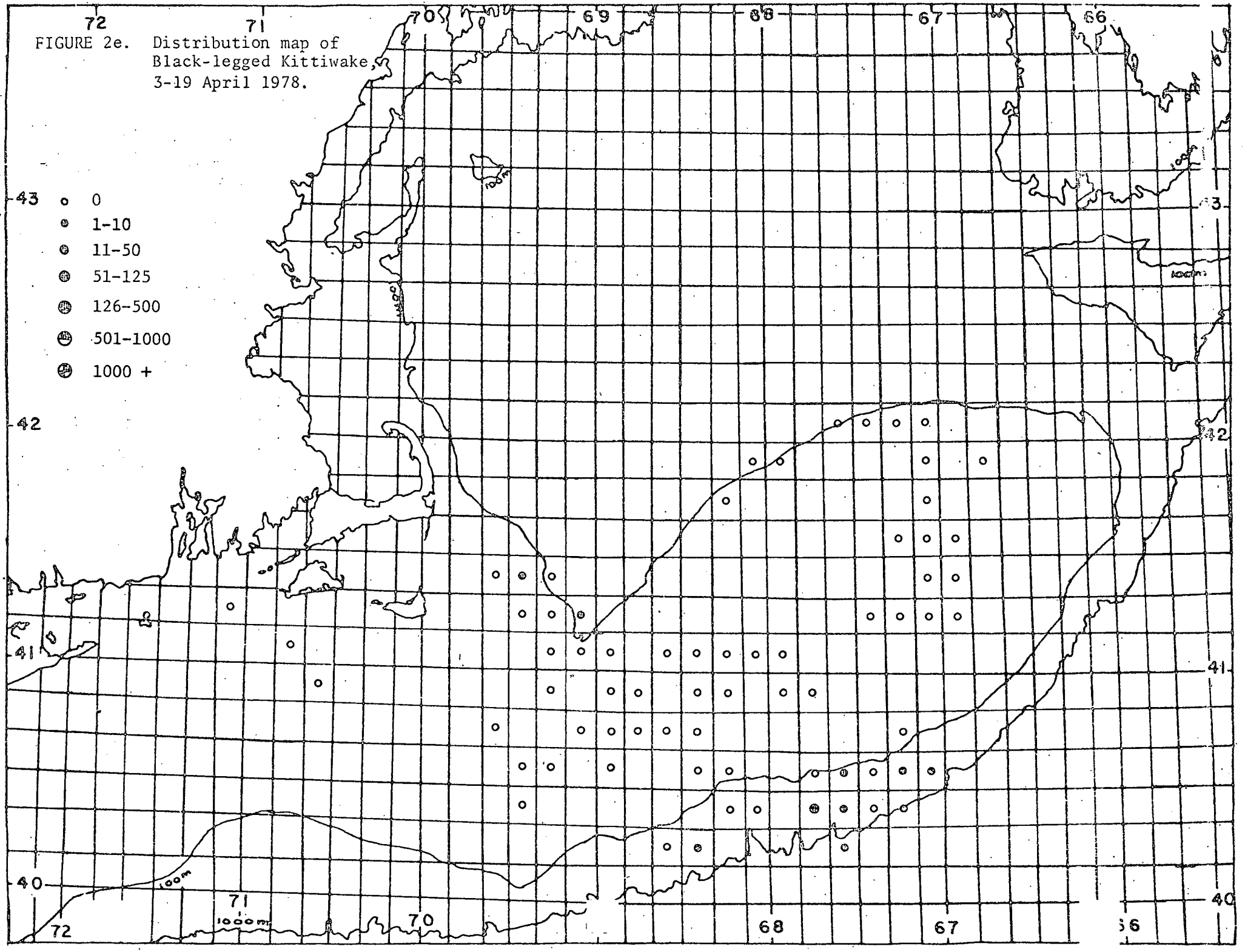

FIGURE 2e. Distribution map of Black-legged Kittiwake, 3-19 April 1978.

Cruise No. 7808

Cruise No. 7808

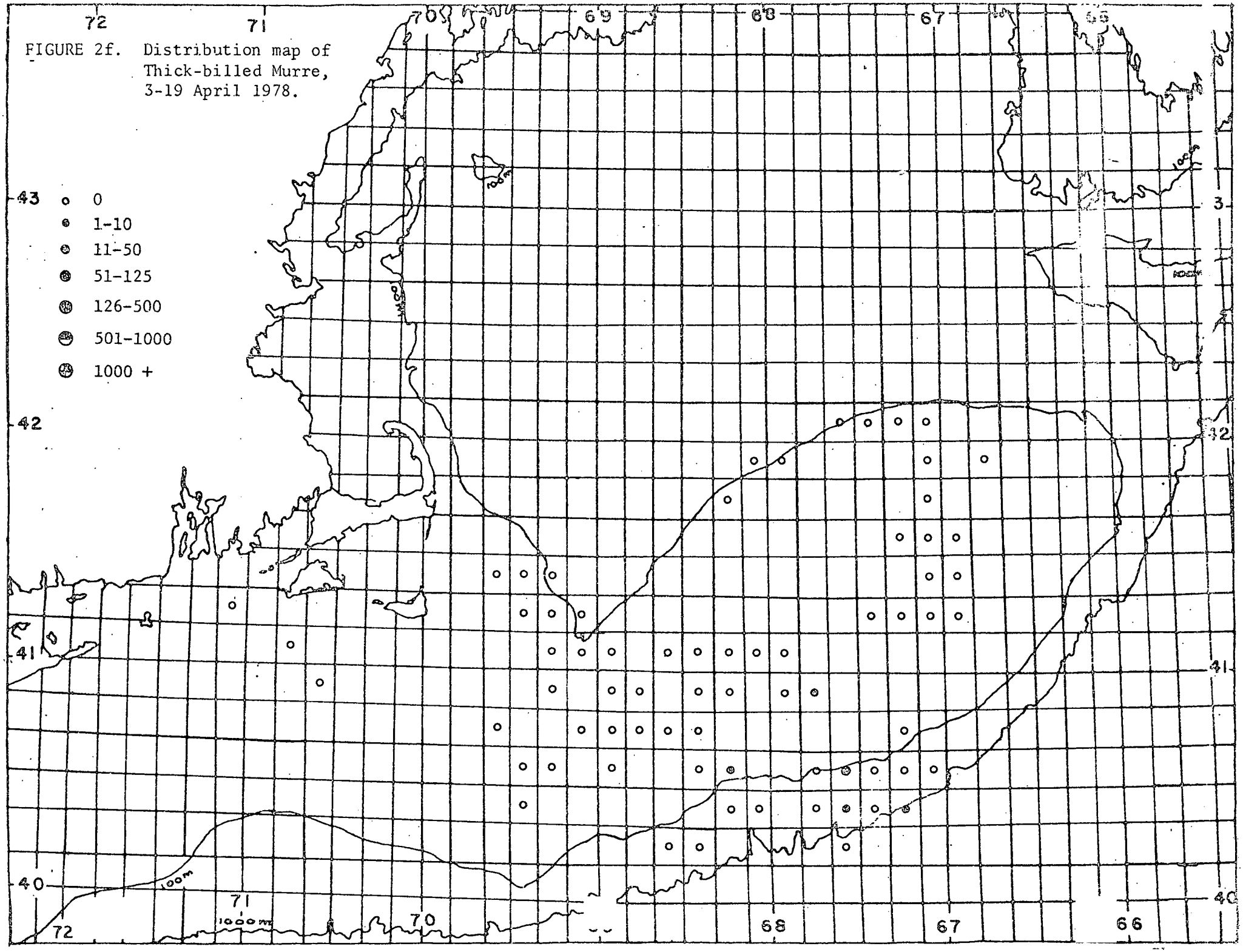

FIGURE 2f. Distribution map of Thick-billed Murre, 3-19 April 1978.

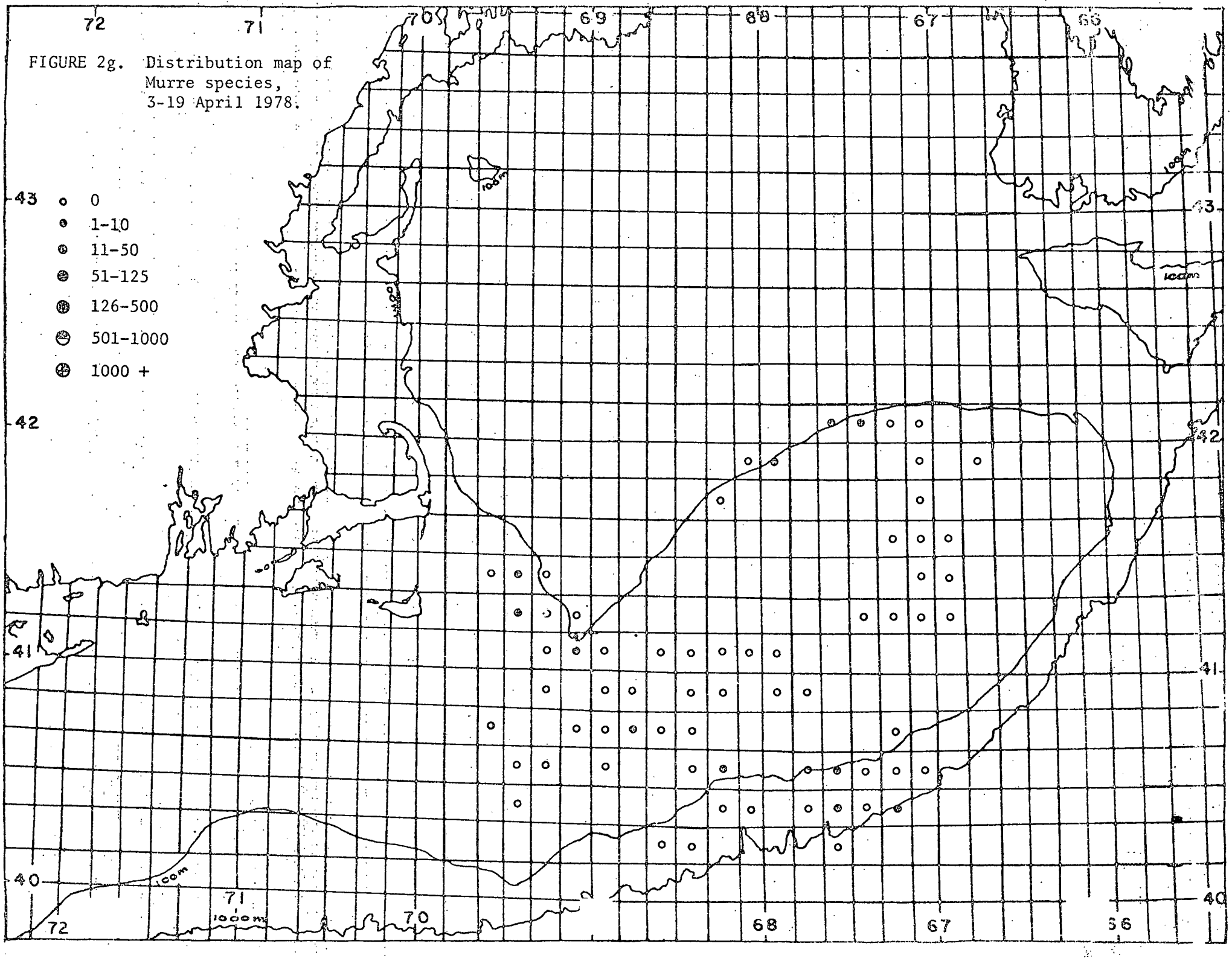

FIGURE 2g. Distribution map of Murre species, 3-19 April 1978.

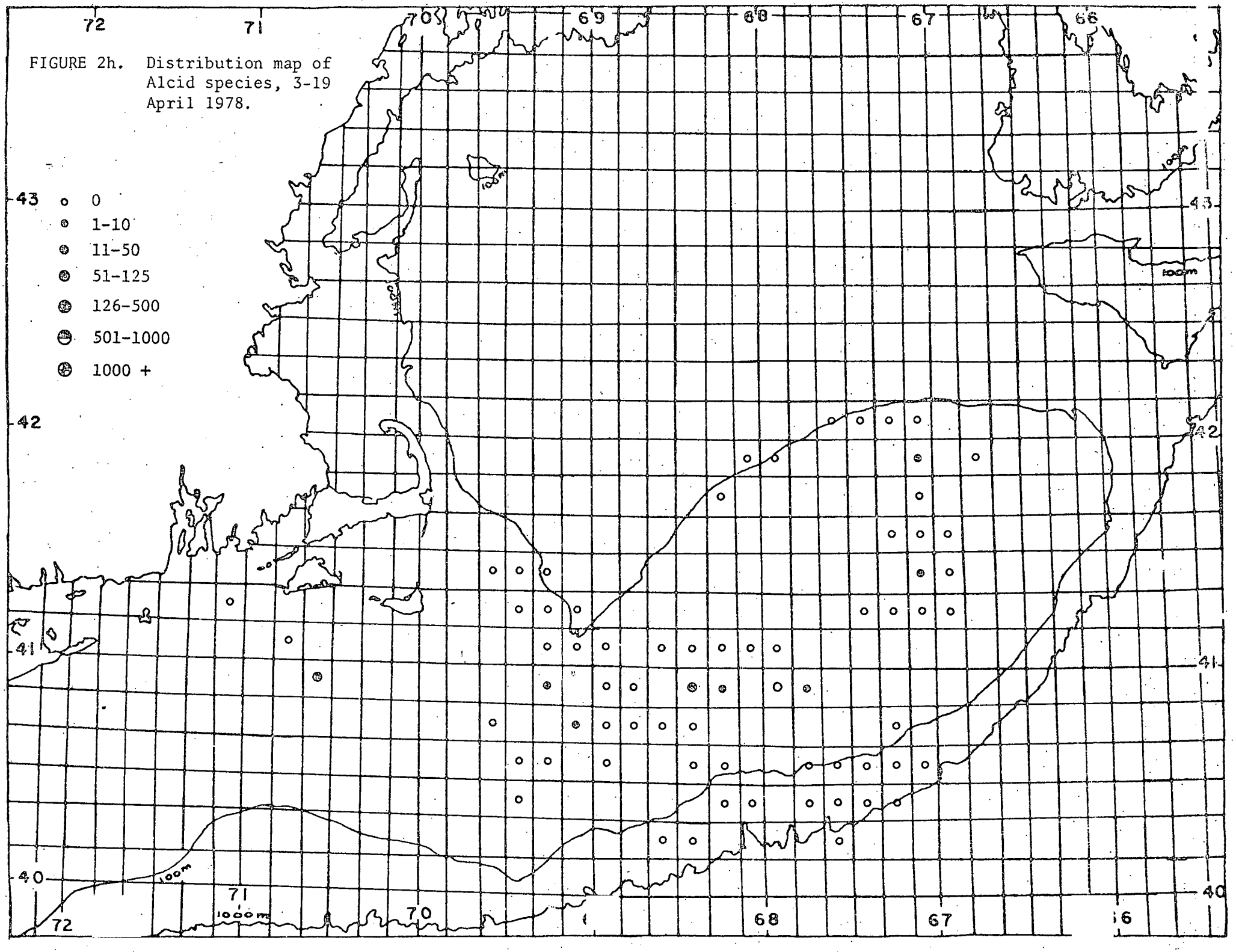

FIGURE 2h. Distribution map of Alcid species, 3-19 April 1978.

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TABLE 6. Summary of Transect or Station Census Data.

USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	1		2		3		4		5		6		7	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1978	3		3		3		3		4		4		4	
Region*	S.N.E.		S.C.		S.N.E.		S.N.E.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	41-14		41-10		41-03		40-58		40-14		40-17		40-20	
Longitude(to nearest min.)	71-07		71-00		70-44		70-34		68-31		68-25		68-19	
Water depth(meters)	33		33		46		49		201		137		137	
Total Birds in F.A.	1		1		0		20		2		6		7	
Area Sampled(km^2)	.74		.93		1.21		1.30		.83		.83		.93	
Birds per Km^2	1.35		1.08		0		15.39		2.41		7.23		7.23	
Species	Number Observed													
Northern Fulmar									1	1	1	1	5	5
Gannet									1	18	3	9	2	4
White-winged Scoter														
Great Black-backed Gull	1	2							0	1				
Herring Gull	0	2	1	1	0	1					1	1		
Black-legged Kittiwake											1	2		
Gull Spp.							0	8						
Razorbill							1	1						
Alcid Spp.							19	19						

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TABLE 6. Summary of Transect or Station Census Data.

Sl USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	8		9		10		11		12		13		14		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.		F.A.	Tot.	
Date(GMT) April 1978	4		4		4		4		4		5		5		
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		
Latitude(to nearest min.)	40-25		40-26		40-25		40-25		40-27		40-43		40-48		
Longitude(to nearest min.)	68-11		68-00		67-48		67-38		67-32		67-16		67-14		
Water depth(meters)	132		141		165		139		139		183		101		
Total Birds in F.A.	3		17		18		2		9		1		37		
Area Sampled(km^2)	1.11		1.39		1.48		1.39		1.39		0.37		0.93		
Birds per km^2.	2.70		12.23		12.16		1.44		6.48		2.70		39.79		
Species	Number Observed														
Northern Fulmar			15	15	2	3	0	6	1	1	1	3	25	91	
Gannet	5	9			1	1	2	2	5	5	0	2			
Great Bl.-bk. Gull	0	3	2	3					2	2			4	12	
Herring Gull			0	1					0	1			8	48	
Bl. -legged Kittiwake					15	15			1	1					

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TABLE 6. Summary of Transect or Station Census Data.

Sh USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	15		16		17		18		19		20		21	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1978	5		5		5		5		6		6		6	
Region*	G.B.		G.B.		O.S.		O.S.		G.B.		O.S.		G.B.	
Latitude(to nearest min.)	40-37		40-33		40-17		40-19		40-33		40-24		40-34	
Longitude(to nearest min.)	67-15		67-26		67-31		67-32		67-10		67-25		67-24	
Water depth(meters)	137		128		1097		914		161		914		137	
Total Birds in F.A.	121		155		2		45		18		12		18	
Area Sampled(km^2)	0.41		1.48		1.48		1.39		1.21		1.21		1.21	
Birds per km^2.	295		104.7		1.35		32.37		14.88		9.92		14.88	
Species	Number Observed													
Northern Fulmar	35	85	45	60			20	222	1	19	2	72	15	15
Sooty Shearwater									1	1				
Leach's Storm-Petrel							0	1						
Gannet	20	50	35	45			10	160	4	14	4	59	1	2
Gr. Bl.-bk. Gull	16	34	35	35	0	3	14	194	2	3	3	43	2	2
Herring Gull	50	100	40	50	1	1			10	29	3	48		
Black-legged Kittiwake							1	1						
Alcid Spp.					1	1								

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TABLE 6. Summary of Transect or Station Census Data.

Sh USCGC VIGILANT Observers A. W. Hickerson

ransect ☑ Station ☐ No.	22		23		24		25		26		27		28	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
ate(GMT) April 1978	6		6		7		7		7		7		7	
egion*	G.B.		G.B.		G.B		G.B.		G.B.		G.B.		G.B.	
atitude(to nearest min.)	40-37		40-35		40-57		40-58		40-59		41-00		41-01	
ongitude(to nearest min.)	67-12		67-31		67-40		67-50		67-57		68-03		68-09	
ater depth(meters)	91		101		55		55		55		46		46	
Total Birds in F.A.	8		6		2		1		0		0		0	
rea Sampled(km^2)	1.21		1.21		0.37		1.39		0.93		0.83		0.93	
Birds per Km^2.	6.61		4.96		5.41		0.72		0		0		0	
Species	Number Observed								NO BIRDS				NO BIRDS	
Northern Fulmar	1	1	2	2	1	3	0	3						
Gannet	1	2	4	9			1	5			0	1		
Great Bl.-bk. Gull	6	9	0	1										
Herring Gull	0	2												
Th. billed Murre					1	1								

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TABLE 6. Summary of Transect or Station Census Data.

Sh USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	29		30		31		32		33		34		35	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
ate(GMT) April 1978	7		7		7		7		7		7		7	
egion*	G.B.		G.B		G.B.		G.B.		G.B.		G.B.		G.B.	
atitude(to nearest min.)	41-01		41-02		41-02		41-03		41-06		41-06		41-10	
ongitude(to nearest min.)	68-15		68-23		68-34		68-39		68-50		68-54		69-02	
ater depth(meters)	51		49		49		55		55		101		101	
Total Birds in F.A.	1		1		0		0		1		0		5	
rea Sampled(km²)	0.83		0.83		0.83		0.83		0.83		0.56		1.30	
Birds per km².	1.21		1.21		0		0		1.21		0		3.85	
Species					NO BIRDS		NO BIRDS		Number Observed		NO BIRDS			
Northern Fulmar	1	1	1	1										
Gannet														
Great Bl.-bk. Gull									1	1			2	3
Black-legged Kittiwake													1	1
Co. m Puffin													2	2

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TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	36		37		38		39		40		41		42	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1978	7		7		8		8		8		8		8	
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	41-12		41-14		41-45		41-48		41-47		41-47		41-48	
Longitude(to nearest min.)	69-08		69-13		68-16		68-18		68-18		68-19		68-17	
Water depth(meters)	91		82		73		155		101		155		119	
Total Birds in F.A.	12		0		29		259		709		101		32	
Area Sampled(km^2)	0.83		0.93		0.93		0.74		0.74		0.65		0.37	
Birds per km^2.	14.46		0		31.18		350		958		155.4		86.49	
Species	Number Observed													
Northern Fulmar	1	1	NO BIRDS		26	156	152	402	400	425	28	303	0	20
Gannet					0	25	5	15	41	41	5	55		
Great Bl.-bk. Gull	2	2			2	5	75	190	18	20	25	275	22	22
Herring Gull	7	7			1	8	27	70	250	270	43	288	10	12
Bl. legged Kittiwake	2	2												

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TABLE 6. Summary of Transect or Station Census Data.

St USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	43		44		45		46		47		48		49	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
ate(GMT) April 1978	8		8		8		8		8		8		8	
egion*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.	
atitude(to nearest min.)	41-50		41-56		42-01		42-05		42-05		42-05		42-05	
ongitude(to nearest min.)	68-09		67-50		67-39		67-35		67-26		67-15		67-02	
ater depth(meters)	101		57		91		124		64		64		60	
Total Birds in F.A.	51		49		48		32		36		56		51	
rea Sampled(km^2)	1.21		1.30		1.30		1.30		1.30		1.30		.93	
Birds per km^2.	42.15		37.69		36.92		24.62		27.69		43.08		54.84	
Species	Number Observed													
Northern Fulmar	45	56	45	100	20	71	27	612	26	257	52	892	50	230
Gannet	5	6			1	7	5	5	4	6	2	2	1	9
Great Bl.-bk. Gull			1	5	13	47			4	12				
Herring Gull	1	4			7	29	0	6	2	8	2	2		
Gull Spp.					0	300					0	300	0	250
Murre Spp.			3	3	10	10	0	1	0	1				

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TABLE 6. Summary of Transect or Station Census Data.

S: USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	50		51		52		53		54		55		56	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1978	8		9		9		9		9		9		9	
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	41-58		41-24		41-20		41-13		41-25		41-29		41-39	
Longitude(to nearest min.)	66-48		66-51		66-54		66-55		66-53		66-56		66-50	
Water depth(meters)	60		67		68		66		66		64		64	
Total Birds in F.A.	21		3		0		5		2		0		2	
Area Sampled(km^2)	0.93		0.65		0.65		0.46		1.02		1.30		0.37	
Birds per km^2.	19.53		4.62		0		10.87		1.96		0		5.41	
Species	Number Observed													
Northern Fulmar	20	45	2	6	0	2	5	5	2	2	0	4	2	6
Great Bl.-bk. Gull	1	2												
Herring Gull			1	1									0	2

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TABLE 6. Summary of Transect or Station Census Data.

Sh USCGC VIGILANT Observers A.W. Wickerson

Transect ☑ Station ☐ No.	57		58		59		60		61		62		63		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) April 1978	10		10		10		10		10		10		10		
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		
Latitude(to nearest min.)	41-39		41-36		41-39		41-39		41-39		41-40		41-33		
Longitude(to nearest min.)	67-09		67-10		67-07		66-59		67-03		67-03		67-03		
Water depth(meters)	59		53		51		58		60		58		62		
Total Birds in F.A.	15		0		3		16		2		3		16		
Area Sampled(km^2)	0.65		0.74		0.74		0.83		0.83		1.11		0.83		
Birds per km^2.	23.08		0		4.05		19.28		2.41		2.70		19.28		
Species	Number Observed														
Northern Fulmar	7	38	0	13	2	5	15	40	2	2	3	13	16	39	
Great Bl.-bk. Gull	5	61			1	1									
Herring Gull	3	55	0	1			1	1							

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TABLE 6.. Summary of Transect or Station Census Data.

Ship: USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	64		65		66		67		68		69		70		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) April 1978	10		10		10		10		10		11		11		
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		
Latitude(to nearest min.)	41-34		41-25		41-21		41-13		41-11		41-11		41-17		
Longitude(to nearest min.)	67-11		67-07		67-07		67-15		67-21		67-08		67-05		
Water depth(meters)	58		57		58		53		53		62		60		
Total Birds in F.A.	3		8		5		2		10		4		5		
Area Sampled(km^2)	0.74		1.11		0.74		0.74		0.74		1.21		1.21		
Birds per km^2.	4.05		7.21		6.76		2.70		13.51		3.31		4.13		
Species	Number Observed														
Northern Fulmar	3	5	6	13	1	201	2	2	10	30	1	14	1	18	
Gannet			1	1			0	1			0	1			
Great Bl.-bk. Gull	0	1	1	1	1	3					2	12	4	8	
Herring Gull			0	1	2	3							0	1	
Common Murre											1	1			
Alcid Spp.					1	1									

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	71		72		73		74		75		76		77	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1977	11		11		11		11		11		11		12	
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		S.N.E.	
Latitude(to nearest min.)	41-17		41-40		41-56		42-01		41-59		42-00		40-49	
Longitude(to nearest min.)	67-05		67-05		67-07		67-03		67-09		67-14		68-55	
Water depth(meters)	60		59		57		60		67		51		66	
Total Birds in F.A.	4		2		0		1		11		10		2	
Area Sampled(km^2)	1.21		1.21		1.39		0.83		0.83		0.74		0.65	
Birds per km^2	3.31		1.65		0		1.21		13.25		13.51		3.08	
Species	Number Observed													
Northern Fulmar	4	15	1	6	0	1	1	4	7	7	7	12	1	2
Gannet			1	1									1	1
Great Bl.-bk. Gull	0	14	0	2			0	1						
Herring Gull	0	1	0	2	0	1	0	1	4	4	3	4		
A d Spp.									0	1				

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	78		79		80		81		82		83		84	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1978	12		12		12		12		12		12		12	
Region*	S.N.E.		S.N.E.		S.N.E.		S.N.E.		S.N.E.		S.N.E.		S.N.E.	
Latitude(to nearest min.)	40-47		40-46		40-44		40-38		40-36		40-28		40-32	
Longitude(to nearest min.)	68-59		69-04		69-08		69-14		69-17		69-26		69-24	
Water depth(meters)	70		79		60		55		60		64		56	
Total Birds in F.A.	0		0		0		0		2		1		2	
Area Sampled(km²)	0.65		0.65		0.65		0.65		0.65		0.74		0.74	
Birds per km².	0		0		0		0		3.08		1.35		2.70	
Species	Number Observed													
Northern Fulmar	1	1			0	1							1	1
Gannet									1	1				
Iceland Gull							0	1	0	1				
Great Bl.-bk. Gull							0	2	0	3	1	1		
H. ing Gull							0	5	1	6			1	1
Alcid Sp.			0	1										

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

Sh USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	85		86		87		88		89		90		91	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1978	12		12		12		13		13		13		13	
Region*	S.N.E.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	40-57		41-05		41-08		41-27		41-27		41-26		41-26	
Longitude(to nearest min.)	69-12		69-12		69-09		69-17		69-24		69-30		69-30	
Water depth(meters)	66		53		95		75		64		40		38	
Total Birds in F.A.	1		4		1		2		1		2		1	
Area Sampled(km^2)	0.74		0.74		0.74		0.83		0.83		0.65		0.65	
Birds per km^2.	1.35		5.41		1.35		2.41		1.21		3.08		1.54	
Species	Number Observed													
Northern Fulmar	1	1	3	3	1	5								
Gannet							2	2	1	1			0	2
Great Bl.-bk. Gull													0	2
Herring Gull	0	1	1	2	0	2	0	6			2	5	1	1
G " Spp.									0	300				
Alcid Spp.	0	1												

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

Sl USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	92		93		94		95		96		97		98		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) April 1977	13		13		13		13		13		13		13		
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		
Latitude(to nearest min.)	41-25		41-22		41-17		41-09		41-05		41-01		40-56		
Longitude(to nearest min.)	69-35		69-22		69-20		69-07		69-01		68-54		68-51		
Water depth(meters)	29		33		71		68		88		66		68		
Total Birds in F.A.	1		1		1		0		1		0		2		
Area Sampled(km²)	0.74		1.02		1.21		1.02		1.02		1.02		1.02		
Birds per km².	1.35		0.98		0.83		0		0.98		0		1.96		
Species	Number Observed										NO BIRDS				
Gannet							0	1							
Great Bl.-bk. Gull	0	1							0	3			1	10	
Herring Gull	1	3	0	1	0	5	0	5	0	3			1	10	
Black-legged Kittiwake			1	1											
M e Spp.			0	2	1	1			1	1					

Cruise No. 7808

TABLE 6.. Summary of Transect or Station Census Data.

Sh USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	99		100		101		102		103		104		105	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1977	13		13		13		13		13		13		14	
Region*	G.B.		G.M.		G.M.		G.B.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	40-51		40-47		40-48		40-40		40-38		40-29		40-22	
Longitude(to nearest min.)	68-46		68-45		68-34		68-28		68-22		68-08		67-15	
Water depth(meters)	68		64		51		63		73		141		150	
Total Birds in F.A.	0		4		27		2		0		3		0	
Area Sampled(km²)	1.02		1.02		0.83		0.83		0.83		0.65		1.30	
Birds per km².	0		3.92		32.53		2.41		0		4.62		0	
Species	Number Observed													
Northern Fulmar	0	1											0	1000
Sooty Shearwater													0	2
Gannet			0	1			2	2					0	200
Phalarope Spp.					26	26	0	2						
I. and Gull													0	1
Great Bl.-bk. Gull	0	5	0	5	0	5	0	2	0	2				
Herring Gull	0	9	2	10	0	8	0	15	0	15	3	3		
Thick-billed Murre													0	1
Murre Spp.			2	2									0	2
Common Puffin					1	1								
Gull Spp.													0	3000

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

Sl USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	106		107		108		109		110		111		112	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) April 1978	14		14		14		14		14		15		15	
Region*	G.B.		G.B.		O.S.		G.B.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	40-30		40-36		40-29		40-32		40-34		40-29		40-36	
Longitude(to nearest min.)	67-10		67-07		67-13		67-30		67-36		67-17		67-11	
Water depth(meters)	157		130		168		123		101		155		146	
Total Birds in F.A.	21		201		0		6		3		11		22	
Area Sampled(km^2)	1.30		1.30		1.11		1.11		0.46		1.21		0.93	
Birds per km^2.	16.15		154.6		0		5.41		1.38		9.09		23.66	
Species	Number Observed													
Northern Fulmar	5	20	79	4029			4	4	2	6	9	11	10	14
Gannet	1	6	10	510			1	1			1	1	5	6
Great Bl.-bk. Gull	3	18	50	2450			0	1			1	2	2	4
Herring Gull	12	32	62	3062			1	1	1	1			5	9
Sea Bird Spp.													0	1000

NO BIRDS

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

Sh: USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	113		114		115		116		117		118		119		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) April 1977	15		16		16		16		16		16		16		
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		
Latitude(to nearest min.)	40-39		40-28		40-34		40-33		40-36		40-35		40-34		
Longitude(to nearest min.)	67-06		67-47		67-34		67-34		67-33		67-23		67-19		
Water depth(meters)	128		139		122		119		91		102		131		
Total Birds in F.A.	143		0		31		28		10		7		7		
Area Sampled(km^2)	0.93		1.11		0.37		0.37		0.65		0.65		0.56		
Birds per km^2.	153.8		0		83.78		75.68		6.50		10.77		12.50		
Species	Number Observed														
Northern Fulmar	29	339			9	19	15	40	1	10	4	6			
Gannet	10	161			5	7	2	12	1	1	1	2	4	4	
Great Bl.-bk. Gull	39	411			12	19	1	3	1	3	0	1	1	4	
Herring Gull	65	595	0	9	5	15	10	28	7	7	2	3	2	7	

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	120		121		122		123		124		125		126		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	[illegible]	F.A.	Tot.	
Date(GMT) April 1978	16		16		16		16		16		16		16		
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		
Latitude(to nearest min.)	40-36		40-33		40-33		40-34		40-36		40-37		40-38		
Longitude(to nearest min.)	67-16		67-14		67-09		67-06		67-02		66-59		66-55		
Water depth(meters)	109		159		182		182		182		190		193		
Total Birds in F.A.	7		10		2		1		5		2		4		
Area Sampled(km^2)	0.83		0.56		0.56		0.56		0.56		0.46		0.37		
Birds per km^2	8.43		5.60		3.57		1.79		8.93		4.35		10.81		
Species	Number Observed														
Northern Fulmar	0	1	4	5	2	2	1	2	2	5	1	3	1	2	
Gannet			2	2									0	2	
Great Bl.-bk. Gull			2	6					2	3			3	3	
Black-legged Kittiwake									0	2					
Th[illegible]-billed Murre	2	2													
M[illegible]e Spp.	5	5													
Seabird Spp.			0	300	0	1000									
Herring Gull			2	4					1	1	1	1			

ruise No. 7808

ABLE 6. Summary of Transect or Station Census Data.

Sh USCGC VIGILANT Observers A.W. Nickerson

ransect ☑ Station ☐ No.	127		128		129		130		131		132		133		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
ate(GMT) April 1978	17		17		17		17		18		18		18		
egion*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		
atitude(to nearest min.)	40-31		40-34		40-29		40-27		40-36		40-36		40-38		
ongitude(to nearest min.)	67-10		67-14		67-38		67-42		67-33		67-38		67-40		
ater depth(meters)	148		128		110		132		99		77		70		
Total Birds in F.A.	2		7		15		2		6		20		2		
rea Sampled(km^2)	1.11		1.11		0.74		1.11		0.93		0.46		0.46		
Birds per km^2.	1.80		6.31		20.27		1.80		6.45		43.48		4.35		
Species	Number Observed														
Northern Fulmar	0	1	3	4	3	4			2	7	1	1	1	9	
Wilson's Storm-Petrel					2	2	2	2							
Great Bl.-bk. Gull	2	2							2	2	13	13			
Herring Gull	0	1							0	1	4	4			
Bla -legged Kittiwake			4	4							2	2			
Razorbill					2	2									
Thick-billed Murre					7	7			2	14					
Murre Spp.					0	2			0	10					
Common Puffin					1	1							1	1	
Seabird Spp.	0	100													

2

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

ip USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	134		135		136		137		138		139		140		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) April 1978	18		18		18		18		18		18		18		
Region*	G.B.		G.B.		G.B.		G.B.		S.N.E.		S.N.E.		S.N.E.		
Latitude(to nearest min.)	40-59		41-00		40-53		40-50		40-37		40-38		40-39		
Longitude(to nearest min.)	67-46		67-57		68-16		68-25		69-10		69-20		69-20		
Water depth(meters)	55		55		46		49		73		46		49		
Total Birds in F.A.	0		0		5		19		1		0		1		
Area Sampled(km^2)	1.39		1.30		1.30		1.39		1.30		1.30		1.30		
Birds per km^2.	0		0		3.85		13.67		0.77		0		0.77		
Species	Number Observed														
Northern Fulmar							4	4	1	1	0	1			
Gannet													1	1	
Herring Gull					0	1	0	2							
Alcid Spp.	0	2	0	10	5	5	15	15							

Cruise No. 7808

TABLE 6. Summary of Transect or Station Census Data.

Ship USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	141		
	F.A.	Tot.	
Date(GMT) April 1978	18		
Region*	S.N.E.		
Latitude(to nearest min.)	40-40		
Longitude(to nearest min.)	69-30		
Water depth(meters)	48		
Total Birds in F.A.	0		
Area Sampled(km^2)	1.30		
Birds per km^2.	0		
Species	Number Observed		
None			

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

- - -

Cruise Report, 17 April - 3 May 1978

MBO Cruise No. 7809

INTRODUCTION

The following cruise report is a summary of bird and mammal observations made by Kevin D. Powers, Staff Biologist, aboard the R/V ALBATROSS IV from 17 April - 3 May 1978. The objective of the cruise was to determine the spring seasonal distribution and relative abundance of fish and invertebrate species found on the continental shelf. Georges Bank, the Gulf of Maine and Scotian Shelf were the primary areas of interest on this cruise. The observer was aboard the vessel on a non-interference basis to primarily 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, Walter E. Beatteay, officers, and crew of the R/V ALBATROSS IV, in addition to Linda Depres, Chief Scientist, and the scientific crew for their assistance aboard ship. Finally, acknowledgement is extended to H.C. Boyar, Vessel Coordinator for NMFS, for arranging passage aboard ship and to 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 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-g indicate the distribution of six bird species and one species group observed using the greatest total bird count of each species per 10-minute square latitude/longitude block surveyed.

The species composition, distribution, and abundance of birds on Georges Bank was undergoing a seasonal change, primarily because of migration. Spring migrants such as Common Loons, Gannets, Red and Northern Phalaropes, and Pomarine Jaegers, were observed. Alcids (Razorbills, murres, Dovekies, and puffins), which are winter visitors, were still evident. Northern Fulmar, Great Black-backed Gull, and Herring Gull numbers appeared to be increasing

on the fishing banks. The return of summer visitors, Wilson's Storm-Petrels and Greater and Sooty Shearwaters, from the Southern Hemisphere was noted.

Loons were observed traveling N to NE in areas west of 68° W. Gannets were widespread and observed moving northerly in most areas surveyed. Gannet sightings generally involved 1-3 adult birds. Phalaropes were also widespread on Georges Bank and southern Gulf of Maine. Although Red and Northern Phalaropes were recorded, identification to species was often difficult. Most unidentified phalarope sightings were believed to be Northerns because of grey not dark or red plumages; however, their molt schedule needs further investigation before specific inferences are justified. Eleven sightings of single individuals and one sighting of a pair of Pomarine Jaegers were recorded in slope waters of eastern Georges Bank. All jaegers, except one, were adult and were usually observed traveling N and NE.

Murres and Dovekies were still present in the Northeast Channel and Peak areas of Georges Bank, but there appeared to be a northeast movement of alcids over the Bank from waters south of Cape Cod.

Northern Fulmar were abundant and widespread and concentrations of several hundred birds were found in areas being fished, i.e. Northern Edge of Georges Bank and Georges Basin of the southern Gulf of Maine. Great Black-backed and Herring Gulls were widespread and usually 25-50 birds of each species followed the ship after a trawl was hauled on deck. Flocks exceeding 100 of both gull species were recorded on Little Georges Bank in the vicinity of domestic fishing activities.

Single Leach's Storm-Petrels were recorded on the Northeast Peak and Northeast Channel. Wilson's Storm-Petrels and Sooty Shearwaters were recorded in slope waters near Corsair Canyon. One sighting of a Greater Shearwater was made in the same area.

TABLE 1.

Seabird Density in Selected Regions Using Fixed-area Transects

18 April - 3 May 1978

Region	Number of Transects	Total Km^2 Surveyed (Tkm^2)	Total Birds (TB)	Mean Density (TB/Tkm^2)	Density Range ($TB/Km^2/Transect$)
Southern New England	1	1.11	3	2.70	
Georges Bank	83	78.96	964	12.21	0.00 - 270.27
Gulf of Maine	40	39.58	398	10.06	0.00 - 124.51
W. Nova Scotia	11	6.46	21	3.25	0.00 - 15.79
Off Continental Shelf	7	7.05	88	9.69	3.92 - 23.53

TABLE 2.

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

18 April - 3 May 1978

Species	Southern New England	Georges Bank	Gulf of Maine	W. Nova Scotia	Off Continental Shelf
Common Loon		5	4		
Unidentified Loon			3		
Northern Fulmar	3	698	306	13	20
Sooty Shearwater		1	1		
Leach's Storm-Petrel		1	1		
Wilson's Storm-Petrel		34			26
Unid. Storm-Petrel		1			
Gannet		29	34	2	3
Red Phalarope		2	3		8
Unid. phalarope		4	14		9
Pomarine Jaeger		1			1
Great Black-backed Gull		50	9	2	
Herring Gull		51	8	3	3
Black-legged Kittiwake		31	2	1	
Unid. ducks		13			
Razorbill		7			
Thick-billed Murre		3	1		
Unid. murre		5			3
Unid. large alcid		15	10		
Dovekie		11	2		15
Common Puffin		1			
Unid. alcid		1			

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

28 April - 3 May 1978

Species	Number	Date	Location	Remarks
Pomaine Jaeger	1	4-19	41°06'N,67°07'W	Circling Ship
Pomaine Jaeger	1	4-19	41°00'N,66°57'W	Ship following
Pomaine Jaeger	1,2	4-19	40°48'N,66°47'W	Traveling NE
Pomaine Jaeger	1	4-19	40°51'N,66°38'W	Circled ship
Pomaine Jaeger	1	4-22	41°15'N,66°15'W	Traveling NE
Pomaine Jaeger	1	4-22	41°10'N,66°17'W	Traveling N
Pomaine Jaeger	1	4-22	41°10'N,66°17'W	Circled ship, traveling NE
Pomaine Jaeger	1	4-22	41°18'N,66°09'W	Traveling NE
Pomaine Jaeger	1	4-22	41°22'N,66°02'W	Flying
Pomaine Jaeger	1	4-22	41°22'N,66°02'W	Traveling NE
Pomaine Jaeger	1	4-22	41°34'N,65°59'W	Traveling NE
Iceland Gull	1	4-18	41°00'N,69°01'W	Ship following (3W)
Common Puffin	1	4-18	41°00'N,68°40'W	Sitting, dove
Razorbill	4,6	4-18	41°01'N,68°33'W	Traveling E
Kumlien's Gull	1	4-19	41°29'N,67°39'W	Ship follower (ad)
Leach's Storm-Petrel	1	4-19	40°50'N,66°47'W	Flying
Greater Shearwater	1	4-19	40°50'N,66°47'W	Flying
Iceland Gull	1	4-19	40°48'N,66°43'W	Ship follower (2W)
Dovekie	2	4-23	42°25'N,66°07'W	Traveling NNE
Red Phalarope	2	4-23	42°23'N,66°18'W	Traveling W (alt. plu.)
Red Phalarope	5	4-23	42°15'N,67°00'W	Sitting, flushed (alt.plu.)
Dovekie	10	4-23	42°11'N,67°13'W	Traveling N
Dovekie	3	4-23	42°10'N,67°23'W	Traveling N
Red Phalarope	1	4-23	42°10'N,67°21'W	Sitting, flushed (alt. plu.)
Leach's Storm-Petrel	1,1	4-22	41°33'N,66°22'W	Flying
Dovekie	14	4-22	41°32'N,66°20'W	Sitting, flushed
Dovekie	2,2,1	4-22	41°27'N,66°19'W	Sitting, flushed
Leach's Storm-Petrel	1	4-22	41°27'N,66°19'W	Flying

TABLE 3 (continued)

Species	Number	Date	Location	Remarks
Red Phalarope	8	4-22	41°27'N,66°19'W	Sitting
Thicked-billed Murre	3	4-22	41°21'N,66°17'W	Sitting, dove
Common Puffin	2	4-22	41°21'N,66°17'W	Sitting (parent & imm.)
Dovekie	10	4-22	41°21'N,66°17'W	Sitting, flushed
Dovekie	5	4-22	41°15'N,66°15'W	Sitting, flushed
Common Puffin	1	4-22	41°15'N,66°15'W	Sitting, dove (imm.)
Dovekie	4	4-22	41°22'N,66°02'W	Sitting, flushed
Thick-billed Murre	3	4-22	41°34'N,65°59'W	Traveling NNE
Unid. loon	2	4-24	41°40'N,68°25'W	Traveling ENE
Dovekie	1	4-24	41°33'N,68°28'W	Traveling S
Common Loon	1	4-24	41°35'N,68°34'W	Traveling NE
Common Loon	1	4-24	41°55'N,68°32'W	Traveling NE
Common Loon	1	4-24	42°12'N,68°29'W	Traveling N
Thick-billed Murre	1	4-24	42°13'N,68°29'W	Sitting
Common Loon	3,1	4-25	41°45'N,69°45'W	Traveling NE
Unid. Loon	1	4-25	41°51'N,69°47'W	Traveling W
Common Loon	3	4-25	41°50'N,69°35'W	Sitting, dove
Red Phalarope	1	4-25	41°52'N,68°56'W	Flying
Iceland Gull	1	4-26	41°32'N,66°49'W	Ship following (3 W)
Leach's Storm-Petrel	1	4-26	42°28'N,66°48'W	Flying
Leach's Storm-Petrel	1	4-26	42°04'N,66°45'W	Flying
Leach's Storm-Petrel	1	5-1	42°28'N,66°01'W	Flying
Red Phalarope	2	5-2	41°22'N,66°05'W	Sitting, flushed
Common Loon	1	5-3	41°25'N,69°12'W	Traveling N
Common Loon	1	5-3	41°27'N,69°18'W	Flying
Northern Phalarope	4	5-3	41°28'N,69°22'W	Sitting, flushed
Common Loon	1,1	5-3	41°26'N,69°36'W	Traveling E

TABLE 4.

List of Non-Marine Bird Sightings

28 April - 3 May 1978

Species	Number	Date	Location	Remarks
Dark-eyed Junco	1	4-23	42°08'N,65°54'W	On ship
Yellow-shafted Flicker	1	4-23	42°13'N,65°54'W	On ship
Starling	1	4-23	42°13'N,65°54'W	On ship
Numenius sp.	1	4-22	41°13'N,66°15'W	Flying W
Brown-headed Cowbird	1	4-24	42°41'N,68°20'W	Flying on ship
Starling	1	4-24	41°39'N,68°45'W	On ship
White-throated Sparrow	1	4-24	41°39'N,68°45'W	On ship
Dark-eyed Junco	1	4-25	41°52'N,69°42'W	On ship
Dark-eyed Junco	1	4-26	42°30'N,66°55'W	On ship
Field Sparrow	1	4-26	41°56'N,66°40'W	On ship
White-throated Sparrow	3	5-1	43°00'N,65°58'W	On ship
Barn Swallow	1	5-2	41°16'N,66°31'W	On ship
Barn Swallow	2	5-3	41°26'N,69°36'W	Flying
Common Grackle	1	5-3	41°26'N,69°36'W	Flying

TABLE 5.

List of Marine Mammal Sightings

28 April - 3 May 1978

Species	Number	Date	Location	Remarks
Atlantic Spotted Dolphin	3	4-19	40°51'N,66°38'W	Porpoising (ID by P. Grabhorn)
Harbor Porpoise	1	4-22	41°40'N,66°32'W	Avoided ship
Finback Whale	2	4-23	42°25'N,66°04'W	Prob. mother w/calf
Unid. Whale	1	4-23	42°15'N,67°00'W	Surfacing
Unid. Whale	1	4-23	42°12'N,67°10'W	Diving
Humpback Whale	1	4-25	41°52'N,69°42'W	Sounded
Humpback Whale	4	4-25	41°51'N,69°13'W	Feeding w/dolphins
Unid. dolphins	6	4-25	41°51'N,69°13'W	Feeding w/whales
Unid. dolphins	2	4-26	42°26'N,67°16'W	Playing/traveling (ID by P. Grabhorn)
Unid. dolphins	5	5-2	41°32'N,65°54'W	Surfacing/traveling (ID by Joe Miller)
Humpback Whale	1,5	5-3	41°25'N,69°12'W	Surfacing
Humpback Whale	4	5-3	41°29'N,69°24'W	Feeding w/dolphins
Unid. dolphins	2	5-3	41°29'N,69°24'W	Feeding w/whales
Unid. dolphins	3	5-3	41°26'N,69°34'W	Surfacing/traveling

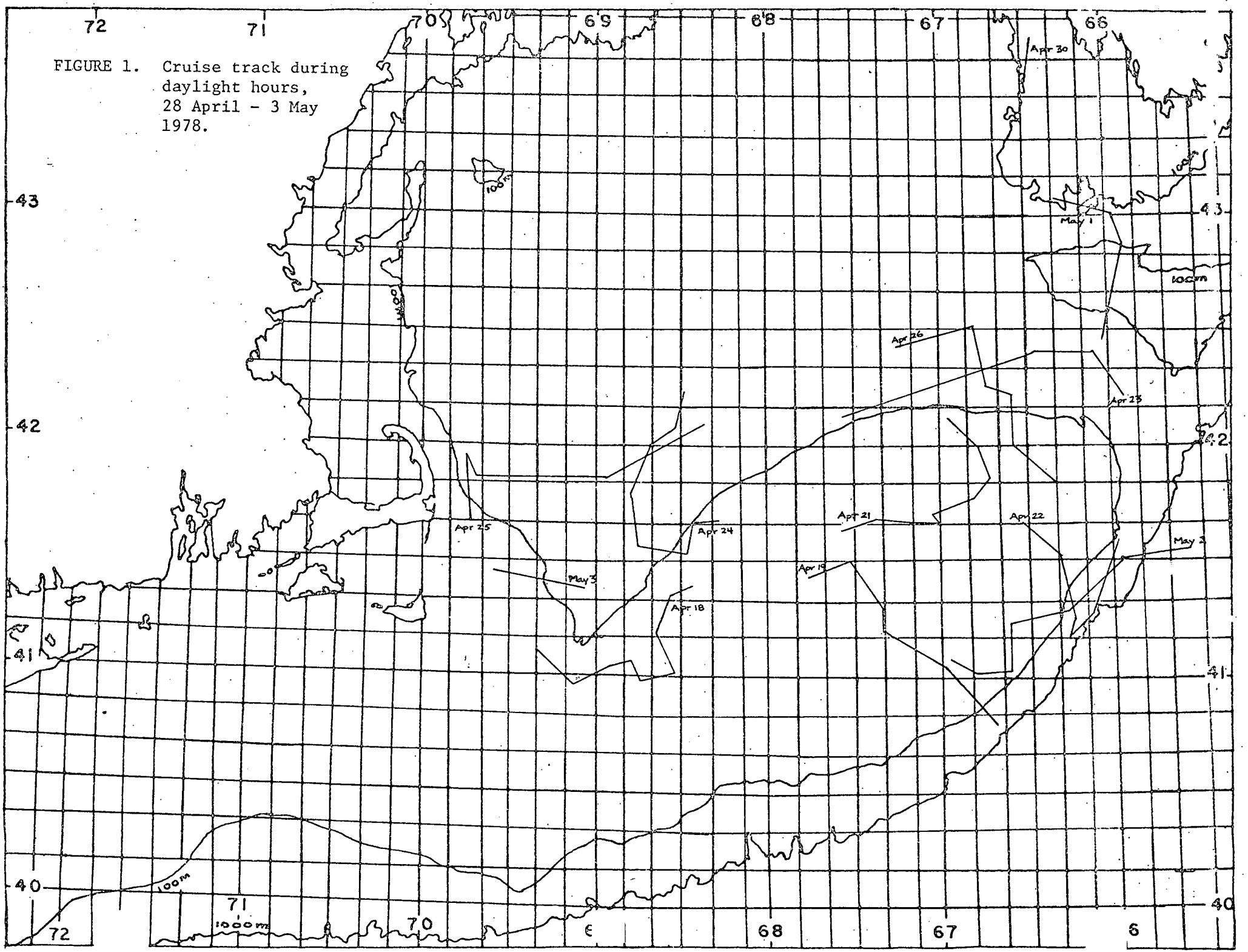

FIGURE 1. Cruise track during daylight hours, 28 April - 3 May 1978.

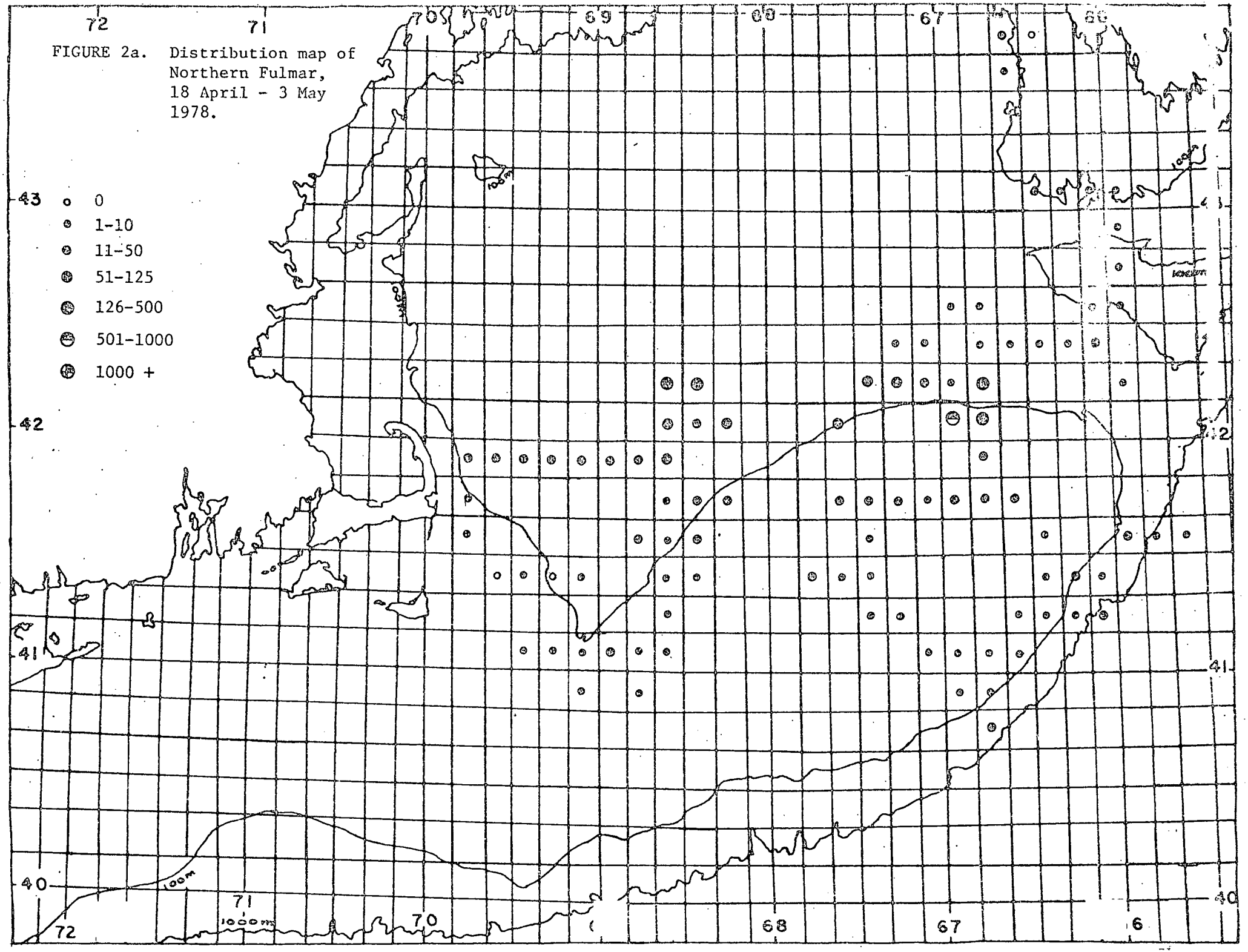

FIGURE 2a. Distribution map of Northern Fulmar, 18 April - 3 May 1978.

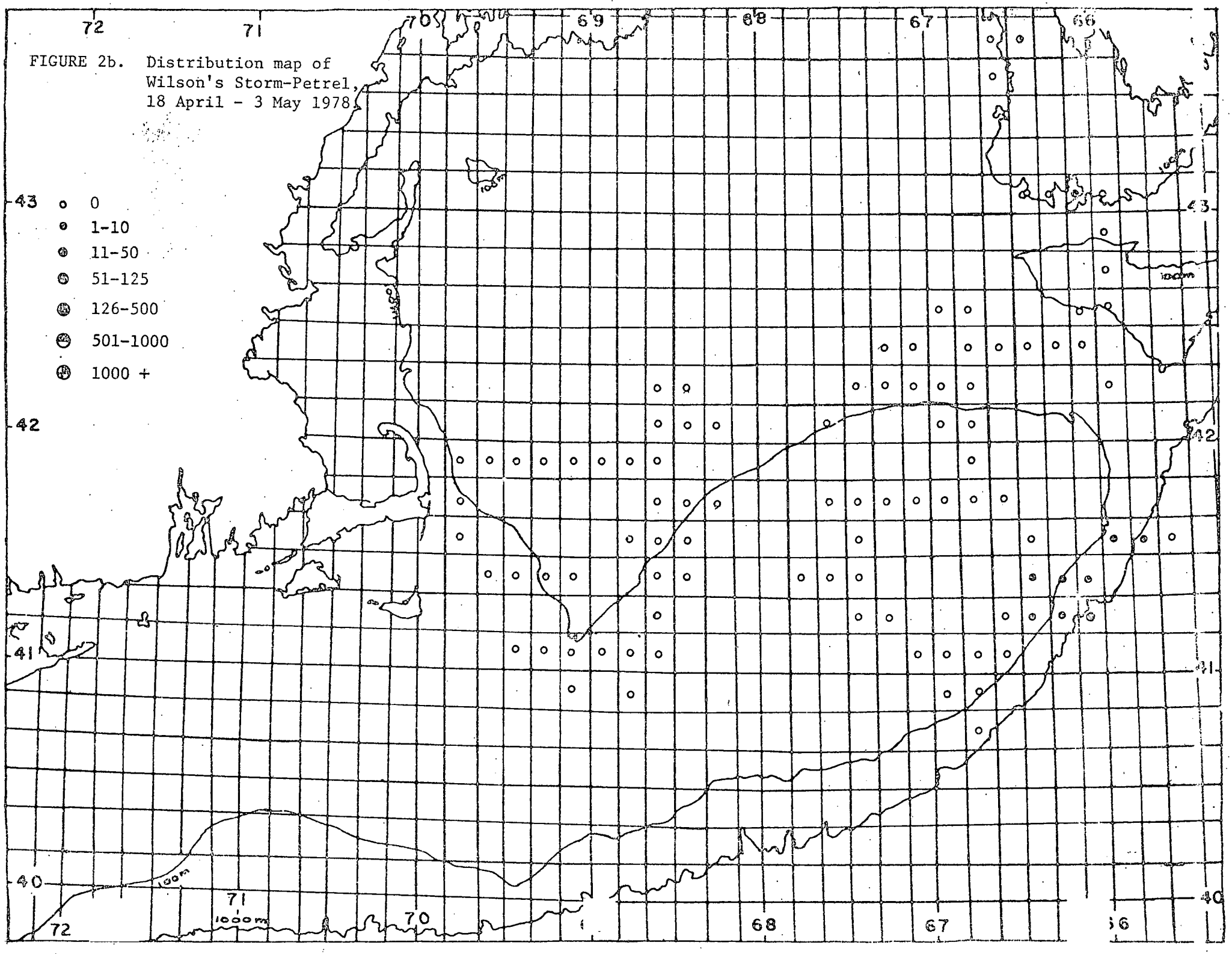

FIGURE 2b. Distribution map of Wilson's Storm-Petrel, 18 April - 3 May 1978.

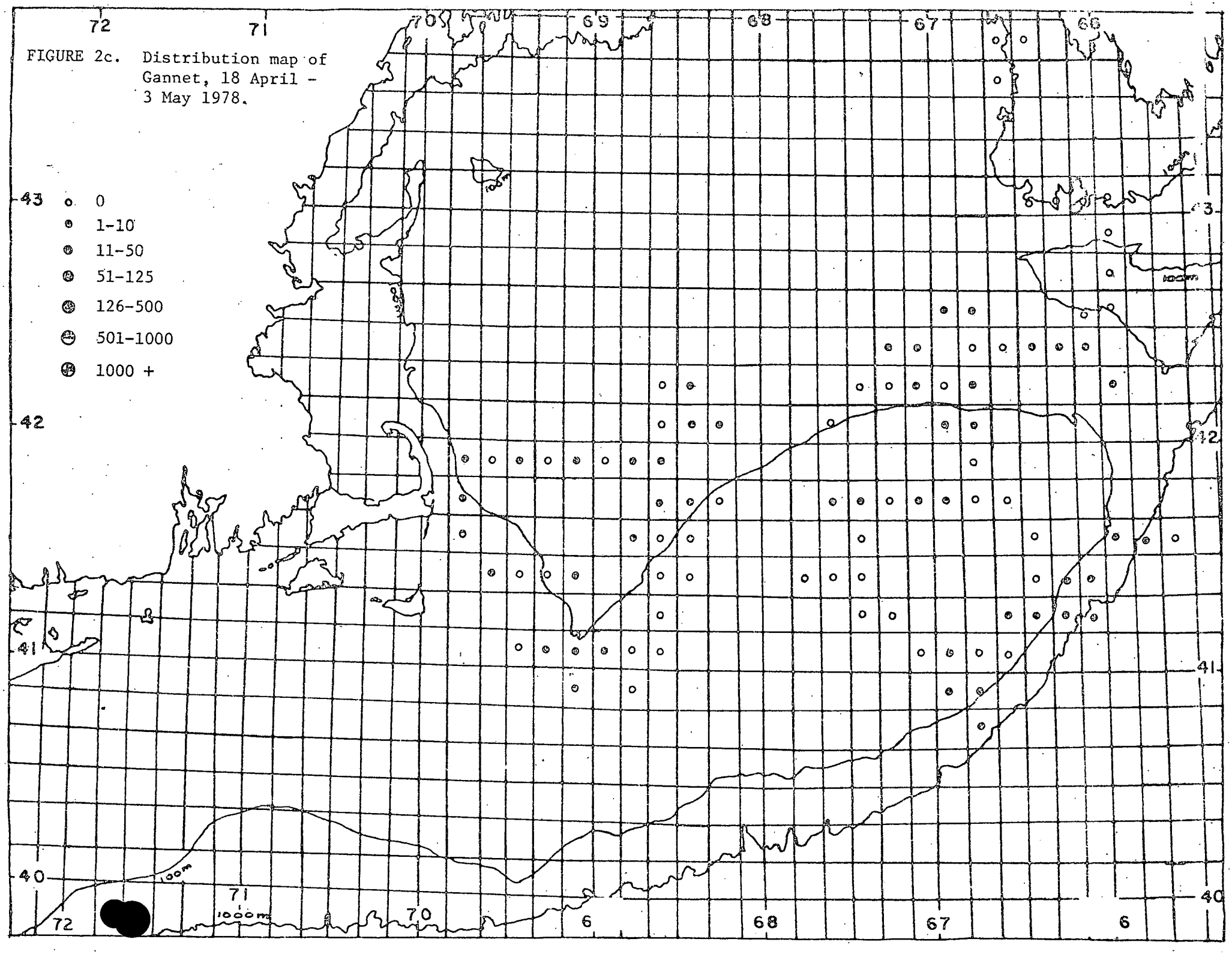

FIGURE 2c. Distribution map of Gannet, 18 April - 3 May 1978.

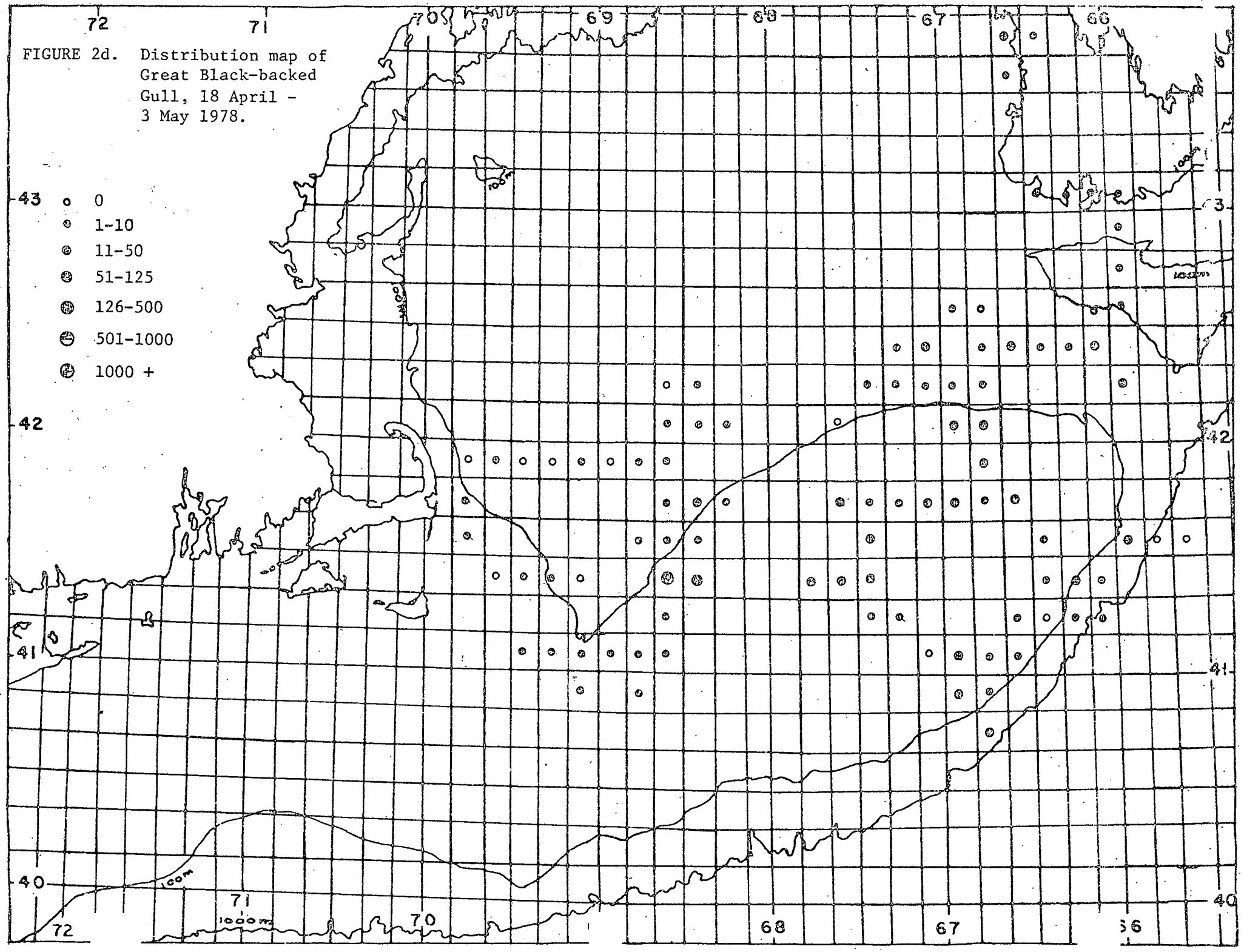

FIGURE 2d. Distribution map of Great Black-backed Gull, 18 April - 3 May 1978.

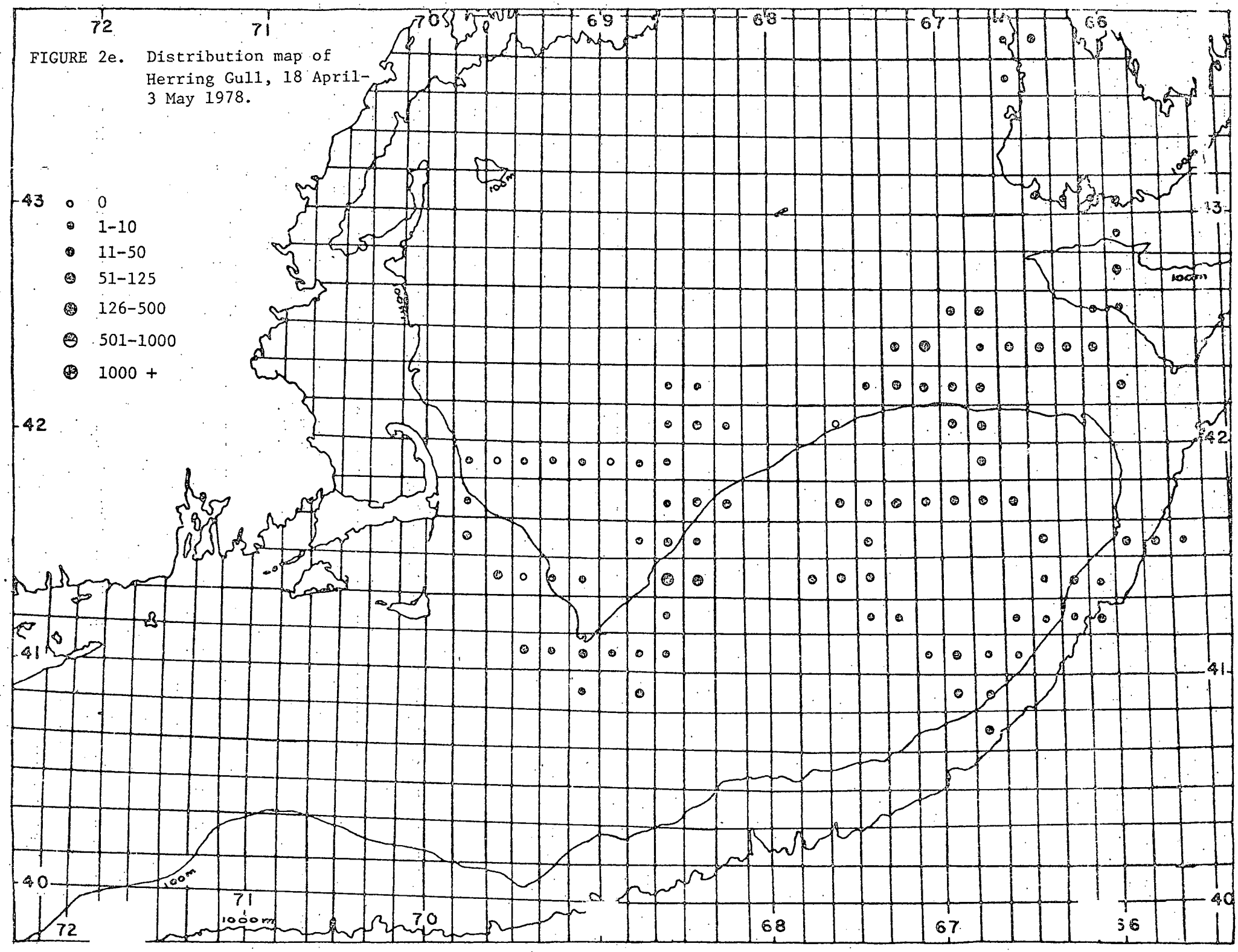

FIGURE 2e. Distribution map of Herring Gull, 18 April-3 May 1978.

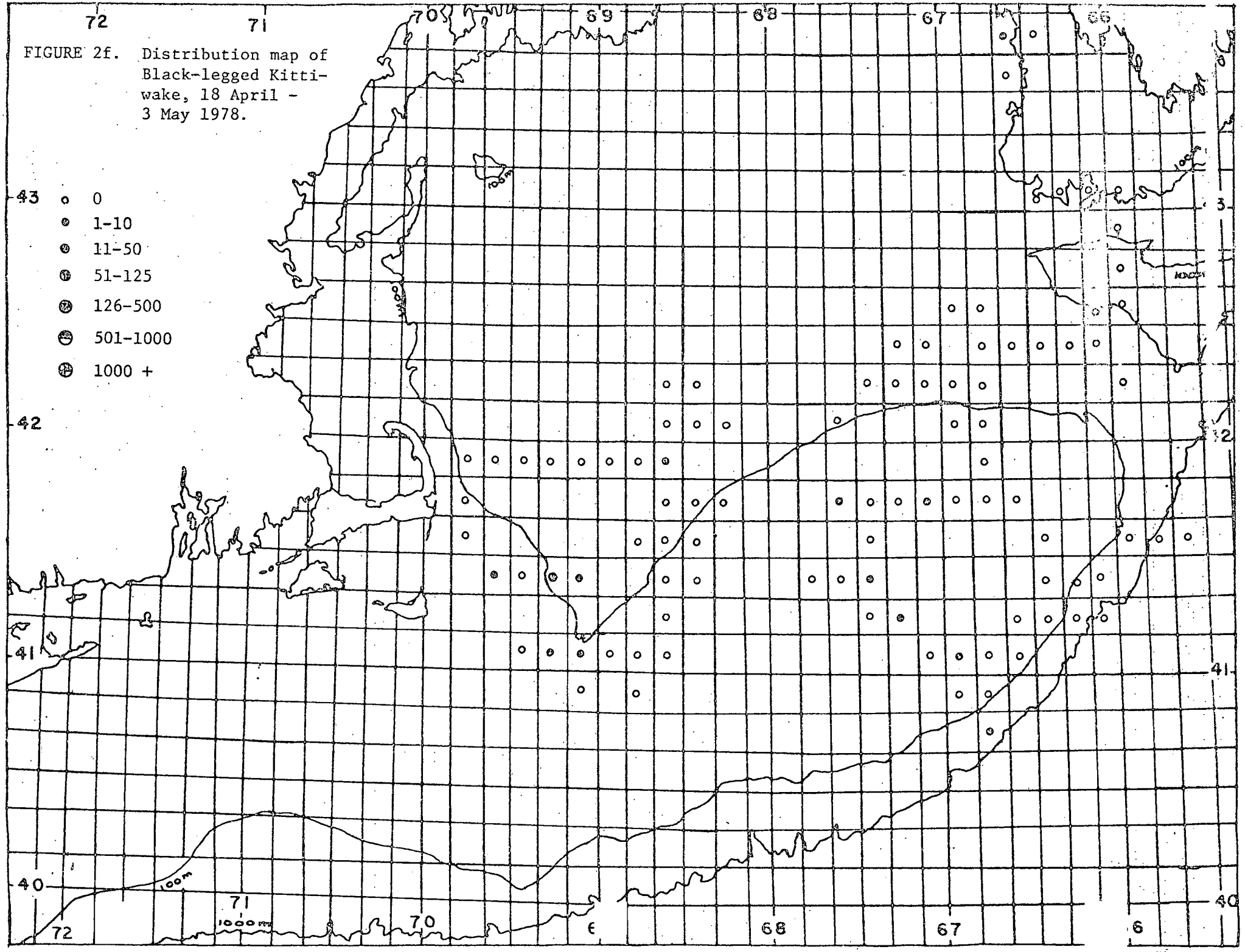

FIGURE 2f. Distribution map of Black-legged Kittiwake, 18 April - 3 May 1978.

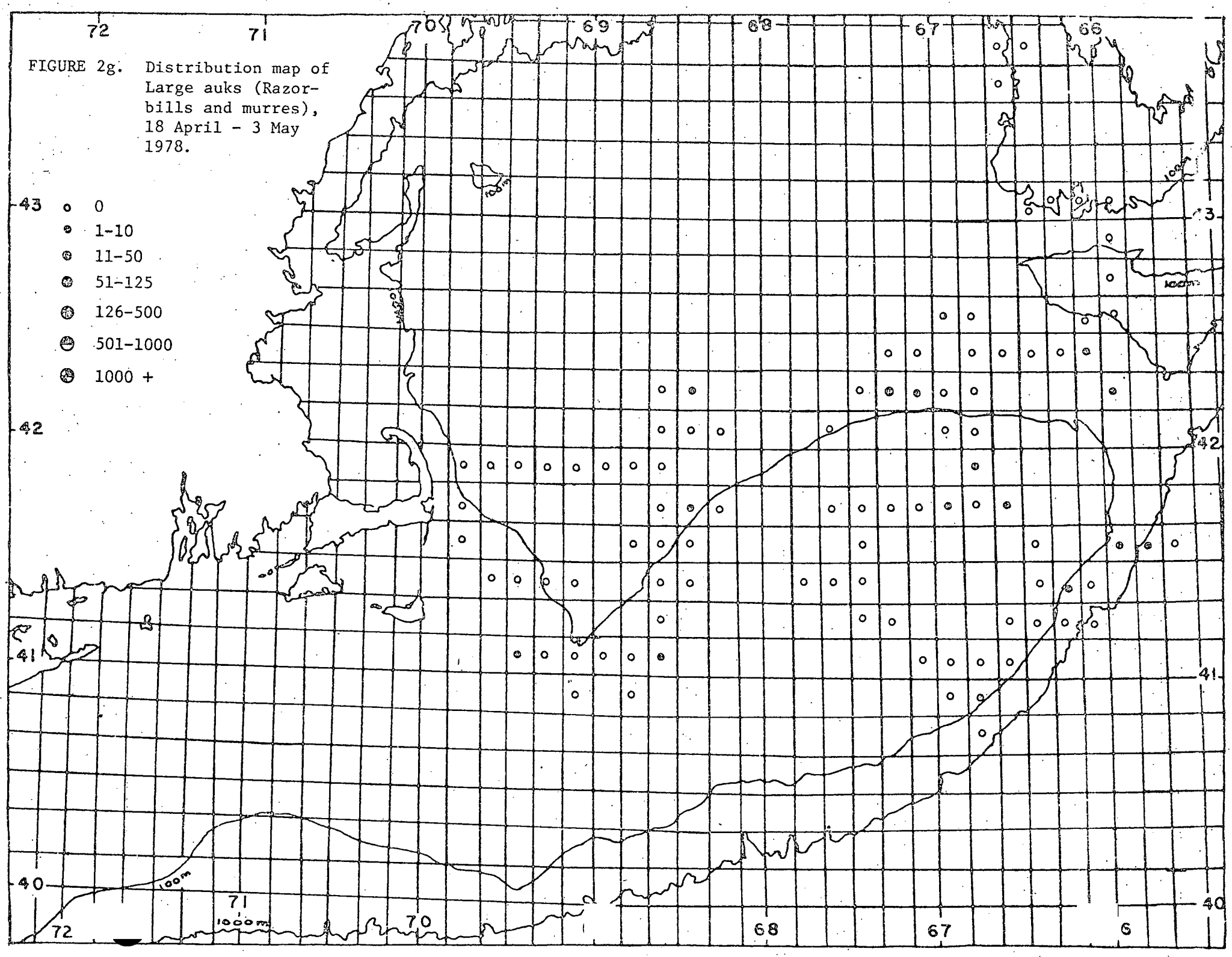

FIGURE 2g. Distribution map of Large auks (Razorbills and murres), 18 April - 3 May 1978.

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TABLE 6. Summary of Transect or Station Census Data.

S R/V ALBATROSS IV Observers K. Powers

Transect ☑ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date(GMT)	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18	4/18
Region*	GB	GB	SNE	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB
Latitude(to nearest min.)	41-07	41-02	40-58	41-00	41-03	41-04	40-59	40-55	41-00	41-01	41-07	41-11	41-05	41-22	41-24
Longitude(to nearest min.)	69-20	69-14	69-09	69-01	68-55	68-48	68-45	68-43	68-40	68-33	68-37	68-39	68-35	68-34	68-27
Water depth(meters)	46	60	58	73	73	51	62	77	64	48	58	58	51	77	69
Total Fixed Area Birds	4	2	3	2	14	6	0	16	3	9	4	3		3	0
Area Sampled(km^2)	1.11	1.02	1.11	1.11	1.11	1.02	1.11	1.11	1.02	1.02	1.20	1.20		1.11	1.11
Density (Birds/km^2)	3.60	1.96	2.70	1.80	12.61	5.88	0.00	17.76	2.94	8.82	3.33	2.50		2.70	0.00
Species	Number Observed														
Northern Fulmar F.A.	1	1	3	0	13	4	0	3	2	2	1	1	SURVEY ONLY	3	0
Tot.	1	1	3	3	15	7	3	7	8	7	6	1		7	4
Gannet F.A.		0	0	1	1										
Tot.		6	3	1	1										
C[illegible] phalarope F.A.															
Tot.															
Great Black-backed Gull F.A.	0	0	0	0	0	2	0	0	0	0	0	0		0	0
Tot.	1	5	2	7	2	5	5	7	8	1	3	3		150	100
Herring Gull F.A.	0	0	0	0	0	0	0	0	0	0	0	2		0	0
Tot.	20	10	6	23	6	2	3	1	15	1	4	2		155	102
Black-legged Kittiwake F.A.		1		1											
Tot.		1		1											
Unidentified lg. gull F.A.		0													
Tot.		150													
Razorbill F.A.										7					
Tot.										7					
Unidentified lg. auk F.A.	3										3				
Tot.	3										3				
Common Puffin F.A.									1						
Tot.									1						
Iceland Gull F.A.				0	0										
Tot.				1	1										
Unidentified ducks F.A.								13							
Tot.								13							

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ABLE 6. Summary of Transect or Station Census Data.

Sh R/V ALBATROSS IV Observers K. Powers

ransect ☑ Station ☐ No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ate(GMT)	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19	4/19
egion*	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB
atitude(to nearest min.)	41-27	41-29	41-30	41-32	41-26	41-22	41-19	41-13	41-10	41-06	41-04	41-00	40-55	40-50	40-48
ongitude(to nearest min.)	67-46	67-39	67-31	67-30	67-26	67-23	67-20	67-20	67-16	67-07	66-59	66-57	66-51	66-47	66-43
ater depth(meters)	37	35	37	48	37	40	40	51	55	62	66	68	88	112	168
Total F.A. birds	1	1	0	1	2	7	2	1	1	6	6	0	4	10	9
rea Sampled(km^2)	1.11	1.11	1.11	1.02	1.02	1.02	0.93	0.93	1.11	1.02	1.02	1.02	1.02	1.02	0.93
Density (Birds / km^2)	0.90	0.90	0.00	0.98	1.96	6.86	2.15	1.08	0.90	5.88	5.88	0.00	3.92	9.80	9.68
Species	Number Observed														
Northern Fulmar F.A.	1	0	0	1	1	2		1	1	6	0	0	2	3	3
Tot.	13	4	8	6	10	5		1	3	6	2	4	5	3	13
Gannet F.A.											0	0	0	2	1
Tot.											1	3	3	2	6
Ur storm-petrel F.A.													1		
Tot.													1		
Wilson's Storm-Petrel F.A.														4	
Tot.														4	
Iceland/Kumlien's Gull F.A.		0	0	0											0
Tot.		1	1	1											1
Great Black-backed Gull F.A.	0	0	0	0	1	3		0	0		0	0	0	0	0
Tot.	26	35	39	23	13	3		5	3		27	20	20	2	21
Herring Gull F.A.	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
Tot.	28	19	25	10	11	2	5	2	6	1	30	41	40	11	22
Black-legged Kittiwake F.A.						0			0		6				5
Tot.						2			1		6				5
Unid. murre F.A.															
Tot.															
Unid. Auk alcid F.A.		1													
Tot.		1													
Unid. phalarope F.A.													1	1	
Tot.													1	1	

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TABLE 6. Summary of Transect or Station Census Data.

Sh R/V ALBATROSS IV Observers K. Powers

ransect ☒ Station ☐ No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
ate (GMT)	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/21	4/22
egion*	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB
atitude (to nearest min.)	41-40	41-41	41-42	41-42	41-40	41-42	41-45	41-47	41-44	41-52	41-55	42-00	42-04	42-08	41-40
ongitude (to nearest min.)	67-33	67-27	67-22	67-15	67-10	67-03	66-55	66-49	66-45	66-43	66-45	66-48	66-52	66-57	66-32
ater depth (meters)	33	64	42	49	55	60	62	60	60	64	66	68	70	73	79
otal F.A. Birds	9	3	7	2	4	7	9	8	14	12	5	100	9	200	13
rea Sampled (km^2)	0.74	0.74	0.65	0.65	1.02	0.93	0.93	0.37	0.83	0.56	1.02	0.56	0.74	0.74	0.93
Density (Birds/km^2)	12.16	4.05	10.77	3.08	3.92	7.53	9.68	21.62	16.87	21.43	4.90	178.57	12.16	270.27	19.35
Species	Number Observed														
Northern Fulmar F.A.	5	3	0	2	3	3	4	8	7	12	5	100	8	200	0
Tot.	23	18	11	14	16	7	14	17	21	23	25	203	218	505	12
Gannet F.A.	2	0	2			1	2					0	1		
Tot.	2	3	2			1	3					2	1		
Un phalarope F.A.	1				1										
Tot	1				1										
Sooty Shearwater F.A.							1		0	0	0				
Tot.							1		1	2	1				
Great Black-backed Gull F.A.	0	0	4	0	0	0	0	0	0	0	0	0	0	0	12
Tot	18	1	4	8	4	15	15	10	3	20	27	16	14	17	14
Herring Gull F.A.	0	0	1	0	0	1	0	0	4	0	0	0	0	0	5
Tot	20	7	8	15	6	24	28	21	12	14	19	20	15	19	20
Black-legged Kittiwake F.A.	1					2									
Tot.	1					2									
Unid. large alcid F.A.							2								1
Tot.							2								1

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TABLE 6. Summary of Transect or Station Census Data.

Sh R/V ALBATROSS IV Observers K. Powers

ransect ☑ Station ☐ No.	46	47	48	49	50	51	52	53	54	55	56	[illegible]	58	59	60
ate(GMT)	4/22	4/22	4/22	4/22	4/22	4/22	4/22	4/23	4/23	4/23	4/23	4/23	4/23	4/23	4/23
egion*	CO	CO	GB	GB	GB	CO	GB	GM	GM	GM	GM	GM	GM	GM	GM
atitude(to nearest min.)	41-32	41-27	41-21	41-15	41-10	41-18	41-34	42-13	42-19	42-25	42-25	42-23	42-22	42-20	42-18
ongitude(to nearest min.)	66-20	66-19	66-17	66-15	66-17	66-09	65-59	65-54	65-58	66-07	66-13	66-18	66-28	66-39	66-49
ater depth(meters)	88	90	99	146	274	488	135	232	240	243	243	256	296	298	291
Total F.A. Birds	15	13	13	2	3	24	5	2	2	8	0	4	5	0	4
rea Sampled(km^2)	0.93	0.93	0.93	1.02	1.02	1.02	0.74	0.84	1.02	0.74	1.02	1.02	1.02	0.93	0.93
Density (Birds/km^2)	16.13	13.98	13.98	1.96	2.94	23.53	6.76	2.38	1.96	10.81	0.00	3.92	4.90	0.00	4.30
Species	Number Observed														
Northern Fulmar F.A.	0	3	0	0	0	0	2	1	0	0	0	2	0	0	2
Tot.	8	11	4	3	4	11	5	8	6	8	3	5	6	5	6
Sooty Shearwater F.A.				0											
Tot.				1											
Thi[illegible]billed Murre F.A.							3								
Tot.							3								
Wilson's Storm-Petrel F.A.		1	1	1	3	13	0								
Tot.		1	1	1	3	18	1								
Gannet F.A.		0	2		0	1			0	1		0	1		
Tot.		1	2		1	1			1	1		1	1		
Red Phalarope F.A.		8										2			
Tot.		8										2			
Unid. phalarope F.A.		0				9							4		
Tot.		6				9							4		
Great Black-backed Gull F.A.	0	0	0	0		0	0	0	2	0	0	0	0	0	2
Tot.	10	14	7	2		4	22	13	7	23	4	3	8	24	11
Herring Gull F.A.	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Tot.	27	23	24	5	6	24	14	14	8	23	44	26	26	35	28
Dovekie F.A.	14	1	10							2					
Tot.	14	1	10							2					
Murre F.A.		0					0								
Tot.		3					3								
Unid. alcid F.A.			0												
Tot.			1												
Pomarine Jaeger F.A.				1		1									
Tot.				1		1									

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TABLE 6. Summary of Transect or Station Census Data.

S: R/V ALBATROSS IV Observers K. Powers

Transect ☑ Station ☐ No.	61	62	63	64	65	66	67	68	69	70	71	[illegible]	73	74	75
Date (GMT)	4/23	4/23	4/23	4/23	4/23	4/23	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24	4/24
Region*	GM	GM	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GM	GM
Latitude (to nearest min.)	42-17	42-15	42-13	42-11	42-10	42-08	41-41	41-41	41-40	41-35	41-32	41-33	41-35	41-36	41-39
Longitude (to nearest min.)	66-54	67-00	67-07	67-13	67-23	67-34	68-19	68-20	68-25	68-25	68-22	68-28	68-34	68-44	68-45
Water depth (meters)	269	230	190	192	194	179	53	106	51	49	47	75	135	146	154
Total F.A. Birds	0	14	23	12	13	49	7	3	4	3	11	5	5	4	9
Area Sampled (km^2)	0.93	0.93	0.93	1.02	1.02	1.02	1.02	1.02	0.83	0.46	1.02	0.93	0.83	0.74	1.11
Density (Birds / km^2)	0.00	15.05	24.73	12.24	12.75	48.04	6.86	2.94	4.82	6.52	10.78	5.38	6.02	5.41	8.11
Species	Number Observed														
Northern Fulmar F.A.	0	0	22	5	12	49	7	2	4	1	8	3	5	3	4
Tot.	3	5	29	80	69	62	25	13	25	8	15	3	6	11	5
Gannet F.A.		3							0	2	3	1		1	1
Tot.		3							1	2	3	1		1	1
U phalarope F.A.		6													
Tot.		6													
Red Phalarope F.A.															
Tot.															
Great Black-backed Gull F.A.	0	0	0	0	1		0	0	0	0	0	0	0	0	4
Tot.	8	7	2	8	5		3	2	19	8	3	1	4	6	5
Herring Gull F.A.	0	0	1	0	0		0	0	0	0	0		0	0	0
Tot.	21	16	15	19	4		11	10	12	6	5		11	2	3
Unid. gulls F.A.			0		0										
Tot.			50		100										
Unid. large alcid F.A.		5		5				1							
Tot.		5		17				1							
Unid. murre F.A.				2											
Tot.				2											
Unid. loon F.A.									0						
Tot.									2						
Dovekie F.A.												1			
Tot.												1			

Cruise No. 7809

TABLE 6. Summary of Transect or Station Census Data.

R/V ALBATROSS IV Observers K. Powers

Transect ☐ Station ☐ No.	76	77	78	79	80	81	82	83	84	85	86	[illegible]	88	89	90
Date (GMT)	4/24	4/24	4/24	4/24	4/24	4/24	4/25	4/25	4/25	4/25	4/25	4/25	4/25	4/25	4/25
Region*	GM	GM	GM	GM	GB	GM	GB	GB	GB	GM	GM	GM	GM	GM	GM
Latitude (to nearest min.)	41-47	41-52	41-58	42-05	42-10	42-13	41-30	41-40	41-45	41-51	41-57	41-52	41-50	41-50	41-51
Longitude (to nearest min.)	68-37	68-34	68-31	68-31	68-30	68-29	69-40	69-44	69-45	69-47	69-45	69-42	69-35	69-25	69-13
Water depth (meters)	174	170	170	176	165	165	31	55	55	110	102	154	177	190	207
Total F.A. Birds	3	5	14	2	37	8	6	0	12	1	2	8	8	16	10
Area Sampled (km^2)	1.02	1.02	1.02	1.02	1.02	1.11	1.11	1.11	1.11	1.11	1.02	1.11	1.02	1.02	1.02
Density (Birds/km^2)	2.94	4.90	13.73	1.96	36.27	7.21	4.50	0.00	10.81	0.90	1.96	7.21	7.84	15.69	10.78
Species	Number Observed														
Northern Fulmar F.A.	2	4	13	2	37	5	1		3		1	8	4	15	10
Tot.	10	17	51	119	191	138	1		3		1	17	35	24	15
Gannet F.A.	1	1	1			2		0			1			1	
Tot.	1	1	5			2		2			2			2	
Black-backed Gull F.A.	0	0	0	0		0	3		1				1		
Tot.	7	5	3	1		9	8		1				2		
Herring Gull F.A.	0	0	0	0	0	0	2	0	4		0	0		0	0
Tot.	7	3	8	8	4	4	11	2	4		4	1		1	1
Black-legged Kittiwake F.A.			0												
Tot.			1												
Thick-billed Murre F.A.						1									
Tot.						1									
Unid. gull F.A.								0							
Tot.								50							
Common Loon F.A.									4				3		
Tot.									4				3		
Unid. loon F.A.										1					
Tot.										1					

Cruise No. 7809

TABLE 6. Summary of Transect or Station Census Data.

S R/V ALBATROSS IV Observers K. Powers

Transect ☑ Station ☐ No.		91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Date (GMT)		4/25	4/25	4/25	4/25	4/25	4/25	4/26	4/26	4/26	4/26	4/26	4/26	4/26	4/26	4/26
Region*		GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GB	GB
Latitude (to nearest min.)		41-52	41-52	41-56	42-00	42-03	42-07	42-26	42-27	42-30	42-32	42-24	42-16	42-12	42-04	42-00
Longitude (to nearest min.)		69-04	68-56	68-46	68-44	68-32	68-22	67-16	67-05	66-55	66-49	66-48	66-44	66-43	66-45	66-45
Water depth (meters)		175	152	137	166	177	179	351	346	305	324	327	278	186	70	70
Total F.A. birds		12	31	11	18	8	3	9	7	5	2	3	20	127	81	42
Area Sampled (km^2)		1.02	1.02	1.11	1.11	1.02	1.02	1.11	1.11	1.02	1.02	1.11	1.02	1.02	1.02	1.30
Density (Birds / km^2)		11.76	30.39	9.91	16.22	18.43	2.94	8.11	6.31	4.90	1.96	2.70	19.61	124.51	79.41	32.31
Species		Number Observed														
Northern Fulmar	F.A.	7	30	11	16	5	3	5	1	0	2	3	14	127	76	17
	Tot.	24	36	18	33	39	67	6	3	1	5	4	25	242	305	96
Unid. loon	F.A.				2											
	Tot.				2											
Gadwall	F.A.	5		0		3	0	1	6	1	0		3			
	Tot.	9		2		3	3	2	6	1	1		5			
Red Phalarope	F.A.		1													
	Tot.		1													
Great Black-backed Gull	F.A.	0		0	0	0	0	0	0	0	0	0		0	4	10
	Tot.	2		1	2	1	1	9	18	3	9	1		3	8	10
Herring Gull	F.A.	0		0	0	0	0	3	0	0	0	0	3	0	0	15
	Tot.	4		6	4	17	6	25	62	14	20	2	3	2	6	15
Unid. phalarope	F.A.									4						
	Tot.									4						
Iceland Gull	F.A.										0		0			
	Tot.										1		1			
Leach's Storm-Petrel	F.A.														1	
	Tot.														1	
Unid. gull	F.A.														0	9
	Tot.														25	60

Cruise No. 7809

TABLE 6. Summary of Transect or Station Census Data.

S R/V ALBATROSS IV Observers K. Powers

Transect ☒ Station ☐ No.	106	107	108	109	110	111	112	113	114	115	116	7	118	119	120
Date (GMT)	4/26	4/26	4/30	4/30	4/30	4/30	5/1	5/1	5/1	5/1	5/1	5/1	5/1	5/1	5/1
Region*	GB	GB	GB	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	GM	WNS	WNS	WNS
Latitude (to nearest min.)	41-56	41-50	43-45	43-47	43-44	43-34	43-03	43-04	43-03	43-00	42-56	42-52	42-44	42-39	42-33
Longitude (to nearest min.)	66-40	66-30	66-27	66-33	66-37	66-39	66-20	66-12	66-05	65-58	65-56	65-54	65-56	65-58	66-02
Water depth (meters)	70	72	77	104	115	143	104	112	97	124	166	119	80	82	146
Total F.A. Birds	6	5	0	6	4	0	0	2	1	1	0	1	2	3	2
Area Sampled (km^2)	1.30	1.20	0.77	0.38	0.58	0.58	0.56	0.56	0.74	0.93	0.56	0.56	0.46	0.46	0.65
Density (Birds/km^2)	4.62	4.17	0.00	15.79	6.89	0.00	0.00	3.57	1.35	1.08	0.00	1.79	4.35	6.52	3.08
Species	Number Observed														
Northern Fulmar F.A.	3	5		5	3	0	0	0	1	0	0	1	0	3	1
Tot.	16	5		17	10	6	7	2	9	1	2	1	1	6	3
Gannet F.A.								2							
Tot.								2							
G Black-backed Gull F.A.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Tot.	3	2	6	16	7	3	1	1	8	6	2	6	1	3	5
Herring Gull F.A.		0	0	1	0	0	0	0	0	1	0	0	1	0	0
Tot.		2	11	7	6	2	1	2	4	6	9	7	12	7	5
Unid. murre F.A.	3														
Tot.	3														
Black-legged Kittiwake F.A.					1										
Tot.					1										
Wilson's Storm-Petrel F.A.									0						
Tot.									1						

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TABLE 6. Summary of Transect or Station Census Data.

Sl R/V ALBATROSS IV Observers K. Powers

Transect ☑ Station ☐ No.	121	122	123	124	125	126	127	128	129	130	131	2	133	134	135
Date (GMT)	5/1	5/2	5/2	5/2	5/2	5/2	5/2	5/2	5/2	5/2	5/2	5/2	5/2	5/2	5/2
Region*	GM	OO	OO	OO	OC	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB
Latitude (to nearest min.)	42-28	41-32	41-33	41-32	41-31	41-30	41-25	41-22	41-20	41-18	41-16	41-15	41-09	41-03	41-01
Longitude (to nearest min.)	66-01	65-48	65-34	65-42	65-50	65-58	66-00	66-05	66-20	66-27	66-31	66-37	66-37	66-38	66-44
Water depth (meters)	221	858	2195	2012	1390	159	201	165	90	92	90	82	80	79	71
Total Fixed Area Birds	5	9	4	6	17	4	11	15	12	5	1	1	4	1	1
Area Sampled (km^2)	0.37	1.11	1.02	1.02	1.02	1.02	1.02	0.56	0.56	0.83	0.83	0.83	1.11	1.02	0.83
Density (Birds/km^2)	13.51	8.11	3.92	5.88	16.67	3.92	10.78	26.78	21.43	6.02	1.20	1.20	3.60	0.98	1.20
Species	Number Observed														
Northern Fulmar F.A.	4	2	4	3	8	2	2	3	5	1	1		2	1	
Tot.	15	9	5	3	12	3	2	5	5	4	1		2	1	
Leach's Storm-Petrel F.A.	1														
Tot.	1														
Gr Black-backed Gull F.A.	0						0	3	0		0	0	1	0	0
Tot.	7						1	6	5		1	5	3	5	2
Herring Gull F.A.	0	0	0	1	1		0	0	0	0	0	0	1	0	1
Tot.	7	19	7	3	2		7	10	6	4	1	3	4	5	4
Wilson's Storm-Petrel F.A.		6			6	2	8	7	7	1					
Tot.		8			6	2	8	9	8	1					
Gannet F.A.		1			1		1			3		1			
Tot.		1			1		1			3		1			
Unid. murre F.A.				2	1										
Tot.				2	1										
Red Phalarope F.A.								2							
Tot.								2							

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TABLE 6. Summary of Transect or Station Census Data.

S R/V ALBATROSS IV Observers K. Powers

Transect ☑ Station ☐ No.	136	137	138	139	140	141	142	143
Date (GMT)	5/2	5/2	5/3	5/3	5/3	5/3	5/3	5/3
Region*	GB	GB	GM	GM	GB	GB	GB	GB
Latitude (to nearest min.)	41-03	41-06	41-23	41-25	41-27	41-29	41-27	41-26
Longitude (to nearest min.)	66-48	66-57	69-03	69-12	69-18	69-24	69-30	69-36
Water depth (meters)	71	68	155	146	88	51	35	29
Total Fixed Area Birds	1	5	4	3	20	2	9	4
Area Sampled (km^2)	0.83	0.46	1.11	1.11	1.11	1.11	1.02	1.02
Density (Birds/km^2)	1.20	10.87	3.60	2.70	18.02	1.80	8.82	3.92
Species	Number Observed							
Northern Fulmar F.A.	1	5	1			1		
Tot.	1	6	1			3		
Gannet F.A.			1					3
Tot			1					3
G Black-backed Gull F.A.	0			0	4	1		
Tot.	3			1	5	3		
Herring Gull F.A.	0		0	1	3		6	1
Tot.	4		4	4	4		11	2
Black-legged Kittiwake F.A.			2	0	12		3	
Tot.			2	2	12		4	
Common Loon F.A.				1	1			0
Tot.				1	1			1
Scoty Shearwater F.A.				1				
Tot.				1				

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 8 - 25 May 1978

Cruise No. 7810

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 8-25 May 1978. The objective of the cruise was to conduct the spring ground fish survey in waters of the Gulf of Maine, Scotian Shelf, and Southern New England. 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 acting captain, Joseph Miller, officers, and crew of the R/V ALBATROSS IV, in addition to Henry Jensen, Chief Scientist, and the scientific crew for their assistance aboard ship. Special thanks are extended to Gary Carter, College of the Atlantic, and John Nicolas, NMFS, who provided their sighting records of marine mammals. 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 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 marine bird species, non-marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours. Figures 2a-h indicate the distribution of eight bird species using the greatest total count of each species per 10-minute square latitude/longitude block surveyed.

Fulmars, Herring Gulls, and Great Black-backed Gulls were abundant and widespread as ship followers over the Gulf of Maine and Scotian Shelf, in sharp contrast to a paucity of sightings and numbers of those species in Southern New England waters. A concentration of these three species estimated at approximately 2000 birds was associated with a Canadian fishing fleet (at least 16 vessels), 30 miles east of La Have Bank on the Scotian Shelf. Also a "natural" feeding assemblage of approximately 700 Wilson's Storm-Petrels was encountered 40 miles east of La Have Bank. Wilson's Storm-Petrels were common in the Gulf of Maine, Scotian Shelf, and slope waters of Southern New England. A feeding assemblage

of about 1000 birds was encountered at 39°55'N, 69°29'W.

Greater and Sooty Shearwaters were abundant in the Southern New England area, but they were uncommon or rare in waters farther north. Alcids including Thick-billed Murres, Common Murres, and a Dovekie) were recorded in small groups at the Scotian Shelf and slope waters of Southern New England. Non-adult Gannets were seen regularly in singles or pairs over most areas surveyed.

Phalaropes represented a problem in their specific identification. Red Phalaropes in breeding plumage were abundant in Southern New England waters but were not recorded farther north. Unidentified phalaropes representing either winter-plumaged Reds and/or either-plumaged Northerns were present in all areas covered. A sighting of Northerns in breeding plumage was recorded in the Gulf of Maine.

Three Pomarine Jaegers, an unidentified jaeger and an unidentified skua were recorded in the Southern New England area. Two of the Pomarine Jaegers were notably seen at the southern entrance to the Cape Cod Canal. In addition, two adults and five immature Black-legged Kittiwakes (4 sightings) and four single Laughing Gulls were recorded. A probable Little Gull was sighted on May 23 at 40°05'N, 71°23'W. Also a "small black and white shearwater" on May 11 at 42°16'N, 65°10'W and a Manx Shearwater on May 24 at 40°15'N, 70°12'W were recorded.

Finally, there were numerous offshore sightings of traveling loons, cormorants, and terns indicating migratory movements.

TABLE 1.

Seabird Density in Selected Regions Within Fixed Area Transects

8 - 25 May 1978

Region	Number of Transects	Total Km^2 Surveyed (Tkm^2)	Total Birds (TB)	Mean Density (TB/Tkm^2)	Density Range (TB/Km^2/Transect)
Gulf of Maine	53	51.53	251	4.87	0.00 - 59.46
Scotian Shelf	36	35.95	394	10.96	0.00 - 196.08
Western Nova Scotia	31	27.45	125	4.55	0.00 - 61.86
Southern New England	21	22.25	842	37.84	0.00 - 491.18
Southern Coastal	7	7.46	33	4.42	0.90 - 11.76
North Coastal	4	4.36	17	3.90	0.93 - 6.03
Off Continental Shelf	1	1.07	4	3.73	

Cruise No. 7810

TABLE 2.

Number of Birds per Species in Selected Regions Within Fixed Area Transects

8 - 25 May 1978

Species	Gulf of Maine	Scotian Shelf	Western Nova Scotia	Southern New England	South Coastal	North Coastal	Off Conti-nental Shelf
Common Loon	3				1	1	
Unid. Loon	3						
Northern Fulmar	33	30	15	5			
Greater Shearwater				46	1		
Sooty Shearwater		1		24	6		
Unid. Shearwater		1		1			
Wilson's Storm-Petrel	21	341	25	597	1		4
Unid. Storm-Petrel				1	2		
Gannet	5	1	9	1		1	
Double-crested Cormorant	4				3		
Red Phalarope				81			
Unid. Phalarope	2		55	12			
Pomarine Jaeger				1			
Herring Gull	56	5	13		5	9	
Great Black-backed Gull	36	7	6	1	4	4	
Unid. Gull	72	3				2	
Common Tern		1					
Unid. Tern	5	3	1	66	10		
Dovekie			1				
Unid. Large Alcid	4						
Unid. Alcid		1		6			
Unid. Birds	7						

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

8 - 25 May 1978

Species	Number	Date	Location	Remarks
Black-legged Kittiwake	2	5-10	42°44'N,66°54'W	Following ship (im.)
Black-legged Kittiwake	1	5-11	42°16'N,65°10'W	Following ship (ad.)
Unid. Shearwater	1	5-11	42°16'N,65°10'W	Small black and white shearwater following ship.
Common Murre	7	5-11	42°35'N,65°05'W	Dove as ship passed
Thick-billed Murre	2	5-12	42°50'N,63°52'W	Dove as ship passed
Laughing Gull	1	5-13	44°08'N,63°44'W	Following ship
Common Tern	1	5-13	44°02'N,63°53'W	Sitting on floating debris.
Black-legged Kittwake	1	5-16	44°07'N,67°04'W	Following ship (ad.)
Dovekie	1	5-16	44°31'N,66°22'W	Flying WSW
Northern Phalarope	14	5-18	43°34'N,70°08'W	Flushed by ship
Black-legged Kittiwake	4	5-19	43°14'N,70°00'W	Circling ship
Laughing Gull	1	5-20	43°18'N,67°16'W	Following ship
Northern Phalarope	3	5-22	42°20'N,70°20'W	Flying NW
Pomarine Jaeger	2	5-23	41°41'N,70°40'W	Milling around jetty
Little Gull (?)	1	5-23	40°40'N,71°12'W	Following ship
Laughing Gull	1	5-23	40°36'N,71°23'W	Flying W
Pomarine Jaeger	1	5-23	40°36'N,71°16'W	Harassing Storm-Petrel
Unid. Jaeger	1	5-23	40°35'N,71°00'W	Flying, then sitting on water

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TABLE 3 (continued)

Species	Number	Date	Location	Remarks
Unid. Skua	1	5-24	40°10'N,68°57'W	Following ship (?)
Red Phalarope	75	5-24	40°08'N,68°50'W	Flushed by ship
Red Phalarope	18,4,9	5-24	40°07'N,68°50'W	Flying NE
Red Phalarope	50	5-24	40°10'N,68°56'W	
Red Phalarope	40	5-24	40°08'N,68°56'W	Flying W
Red Phalarope	7,30	5-24	40°04'N,68°57'W	Flying ENE
Red Phalarope	125	5-24	40°02'N,69°15'W	Flushed by ship
Red Phalarope	11	5-24	40°02'N,69°15'W	Flying SSE
Manx Shearwater(?)	1	5-24	40°05'N,70°12'W	Following ship
Red Phalarope	140,2	5-24	40°05'N,70°12'W	Flying E
Laughing Gull	1	5-25	40°53'N,71°29'W	Milling around ship

TABLE 4.

List of Marine Mammal Sightings

8 - 25 May 1978*

Species	Number	Date	Location	Remarks
Probable Minke and Common Dolphin	4 10	5-8	42°07'N,70°05'W	200 Gulls and Gannets hovering over the assemblage
Possible Finback	1	5-10	42°43'N,66°41'W	Surfacing, spouting
Unid. Whale	1-2	5-11	42°36'N,65°03'W	Seen spouting
Possible Harbor Porpoise	1	5-12	42°47'N,63°59'W	Surfacing
Unid. Whale	1	5-12	42°50'N,63°47'W	Surfacing
Minke	3-4	5-13	43°39'N,63°52'W	Surfacing
Probable Harbor Porpoise	1	5-19	43°24'N,70°08'W	Triangular dorsal
Common Dolphin	4-6	5-22	42°28'N,70°16'W	Steady swimming
Probable Minke	1	5-22	42°21'N,70°16'W	Surfacing
Probable Finback	2-3	5-22	42°24'N,70°33'W	Surfacing
Unid. Whale	1	5-22	42°32'N,70°21'W	Seen spouting
Probable Minke	2	5-23	40°54'N,70°57'W	Slow swimming
Unid. *Balaenoptera*	1	5-23	40°38'N,70°55'W	Seen spouting
Finback or Sei (?)	1	5-24	39°56'N,69°53'W	Surfacing--small dorsal
Common Dolphin	9-11	5-24	40°03'N,70°18'W	Surfacing
Pilot Whale	75-100	5-24	40°22'N,69°08'W	Steady swimming--lobtailing
Common Dolphin	ca. 100	5-24	40°09'N,68°53'W	Surfacing--no jumping
Common Dolphin	5	5-24	40°10'N,68°56'W	Steady swimming
Common Dolphin	7-9	5-24	40°04'N,68°57'W	Jumping from water

Cruise No. 7810

TABLE 4 (continued)

Species	Number	Date	Location	Remarks
Unid. Whale	1	5-24	40°02'N,69°25'W	Seen spouting
Common Dolphin	7-9	5-24	39°56'N,69°53'W	Jumping and lobtailing
Common Dolphin	6-7	5-24	40°35'N,69°45'W	Attracted to bow

* Identification and compilation by Gary Carter, COA, and John Nicholas, NMFS, Woods Hole, MA.

TABLE 5.

List of Non-Marine Bird Sightings

8 - 25 May 1978

Species	Number	Date	Location	Remarks
White-throated Sparrow	1	5-9	42°39'N,68°46'W	Sitting on deck
Chipping Sparrow	1	5-10	42°44'N,66°48'W	Sitting on deck
White-throated Sparrow	2	5-10	42°43'N,66°22'W	Sitting on deck
Barn Swallow	1	5-11	42°25'N,65°37'W	Sitting on deck (im.)
Yellow-rumped Warbler	1	5-11	42°25'N,65°37'W	Sitting on deck
White-throated Sparrow	1	5-11	42°35'N,65°06'W	Captured and banded
Barn Swallow	1	5-11	42°37'N,65°02'W	Sitting on deck (ad.)
Yellow-rumped Warbler	1	5-12	43°04'N,64°26'W	Sitting on deck
Barn Swallow	1	5-13	43°57'N,63°45'W	Sitting on deck
White-throated Sparrow	1	5-13	44°05'N,63°43'W	Sitting on deck
White-throated Sparrow	1	5-14	43°28'N,64°44'W	Captured and banded
Common Yellowthroat	1	5-14	43°24'N,64°44'W	Circling ship
Common Yellowthroat	1	5-19	43°31'N,70°10'W	Flying on ship
Barn Swallow	2	5-19	43°26'N,70°09'W	Circling ship
White-throated Sparrow	1	5-19	43°26'N,70°09'W	Sitting on deck
Chipping Sparrow (?)	1	5-19	43°26'N,70°09°W	Sitting on deck (im.)
Blue Jay	3	5-19	43°16'N,70°12'W	Flying NNE
Purple Finch	1	5-19	43°17'N,70°08'W	Sitting on deck (f)
Unid. Swallow	2	5-19	43°12'N,70°08'W	Flying E

TABLE 5. (continued)

Species	Number	Date	Location	Remarks
Barn Swallow	2	5-19	43°12'N,70°08'W	Circling the ship
Evening Grosbeak	1	5-19	43°10'N,70°05'W	Captured and banded
White-throated Sparrow	1	5-20	43°30'N,67°45'W	Immature on deck
Yellow Warbler (?)	1	5-20	43°30'N,67°46'W	Circling ship
Barn Swallow	1	5-20	43°19'N,67°16'W	
Barn Swallow	1	5-20	43°14'N,67°53'W	
Barn Swallow	1	5-21	42°44'N,69°55'W	Milling around ship
Red-winged Blackbird	1	5-22	42°20'N,70°20'W	Flying with ship (m.)
Barn Swallow	1	5-22	42°20'N,70°20'W	
Eastern Kingbird	1	5-22	42°23'N,70°29'W	Circling ship
Yellow Warbler	1	5-23	40°36'N,71°16'W	Circling ship
Eastern Kingbird	1	5-23	40°35'N,71°05'W	Circling ship
Yellow-rumped Warbler	1	5-23	40°35'N,71°00'W	Circling ship
Barn Swallow	1	5-24	40°02'N,69°15'W	
Barn Swallow	1	5-25	41°21'N,71°35'W	Circling ship
Barn Swallow	1	5-25	41°08'N,71°32'W	Circling ship
Magnolia Warbler	1	5-25	41°00'N,71°37'W	Captured and banded

Cruise No. 7810

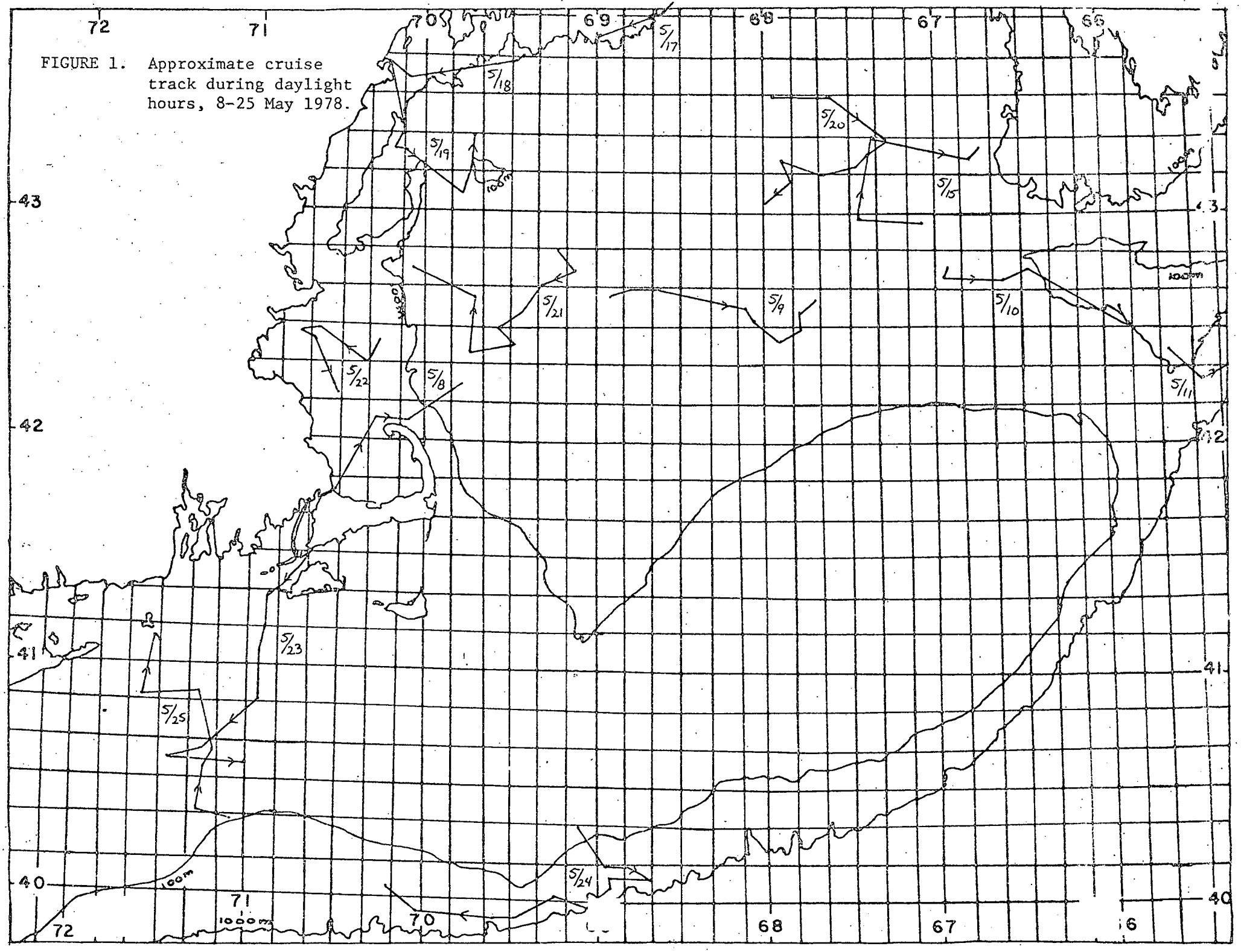

FIGURE 1. Approximate cruise track during daylight hours, 8-25 May 1978.

Cruise No. 7810

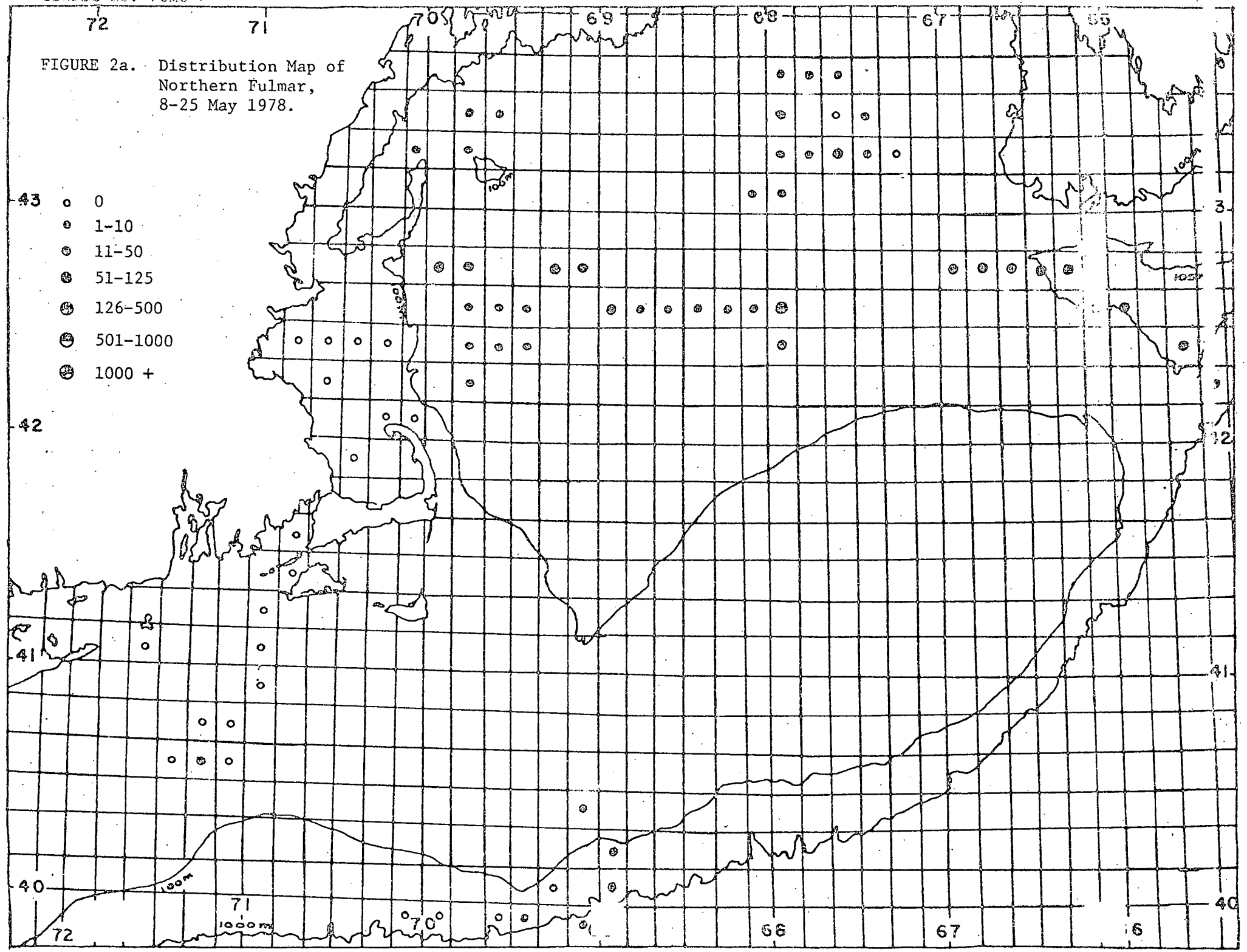

FIGURE 2a. Distribution Map of Northern Fulmar, 8-25 May 1978.

Cruise No. 7810

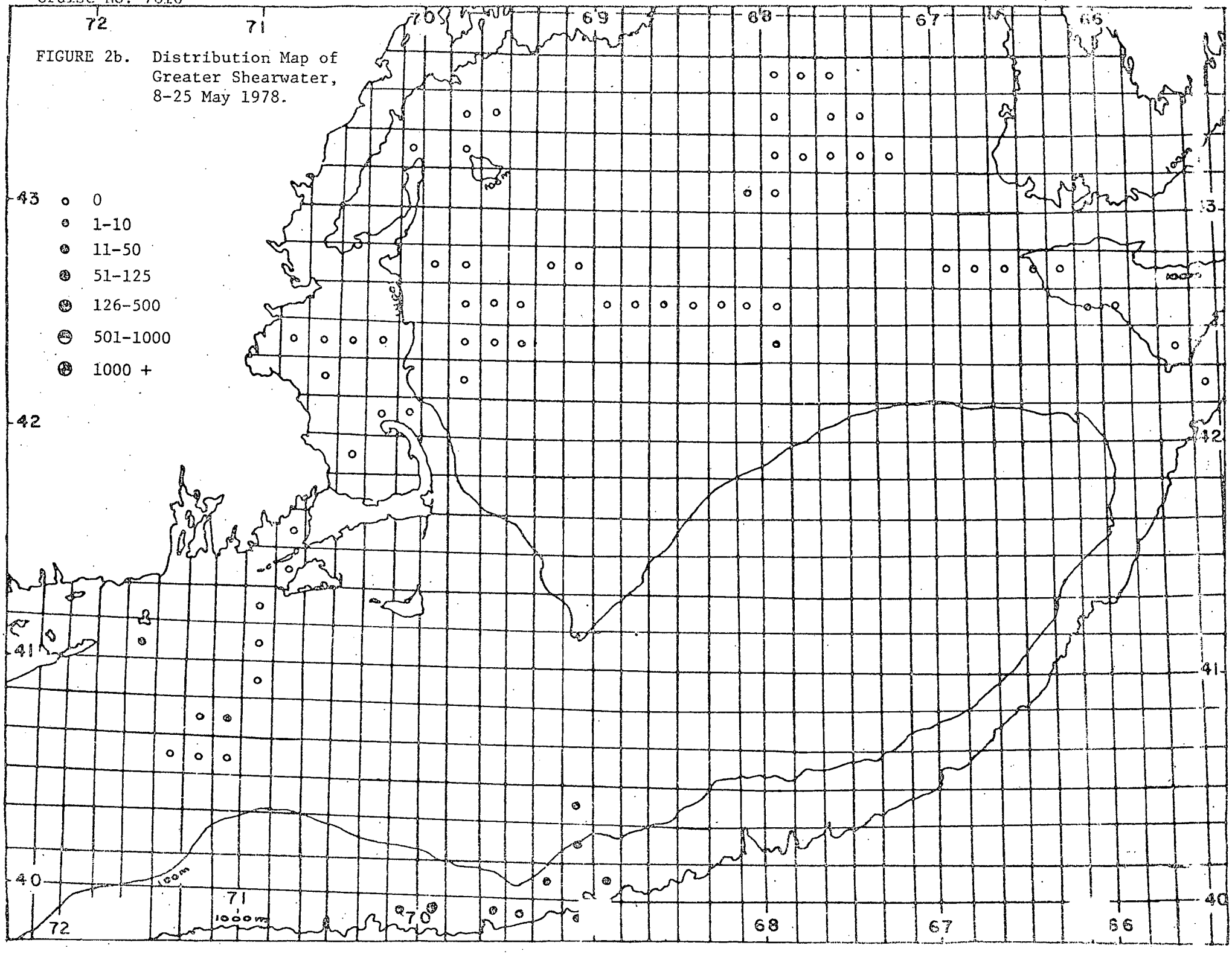

FIGURE 2b. Distribution Map of Greater Shearwater, 8-25 May 1978.

Cruise No. 7810

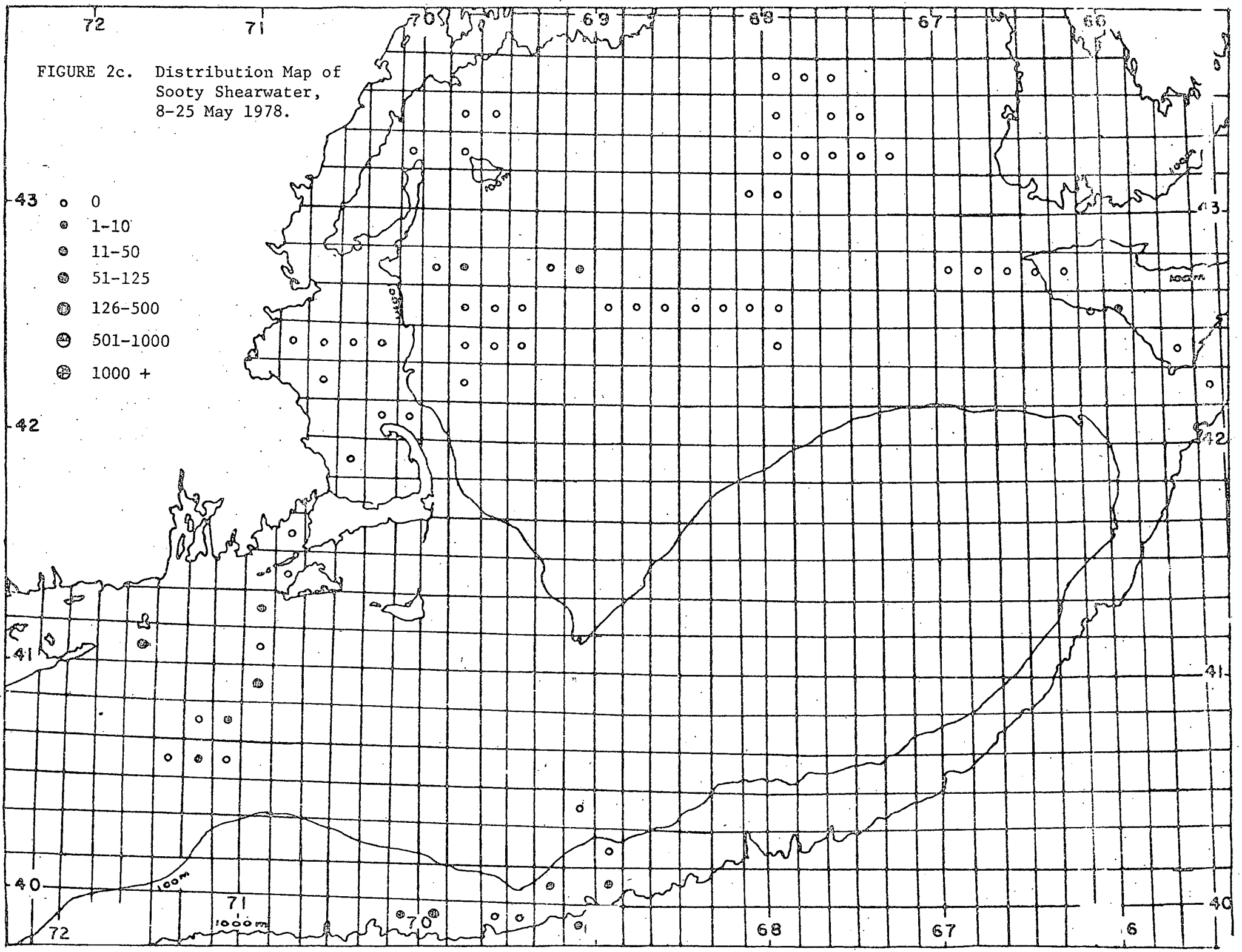

FIGURE 2c. Distribution Map of Sooty Shearwater, 8-25 May 1978.

Cruise No. 7810

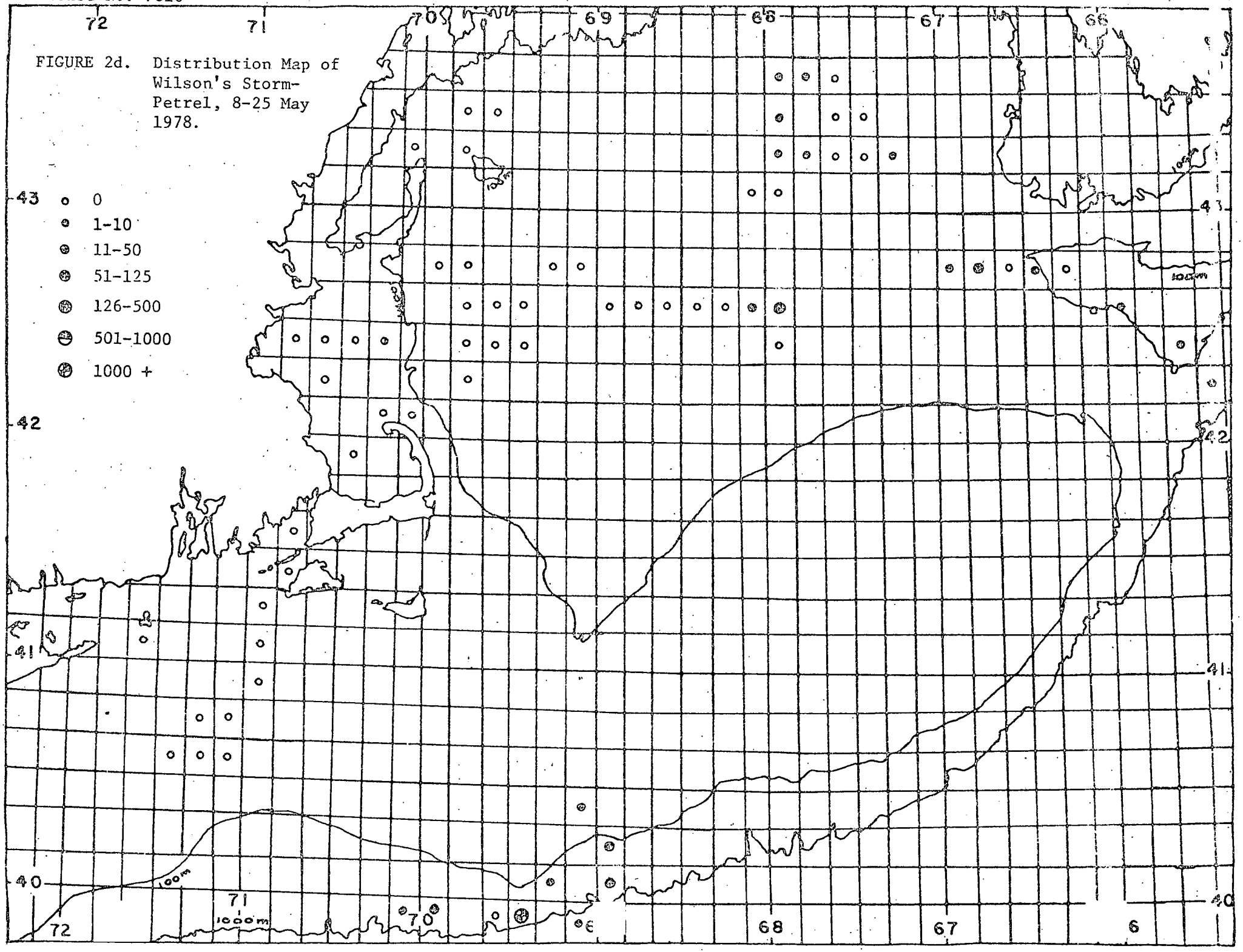

FIGURE 2d. Distribution Map of Wilson's Storm-Petrel, 8-25 May 1978.

Cruise No. 7810

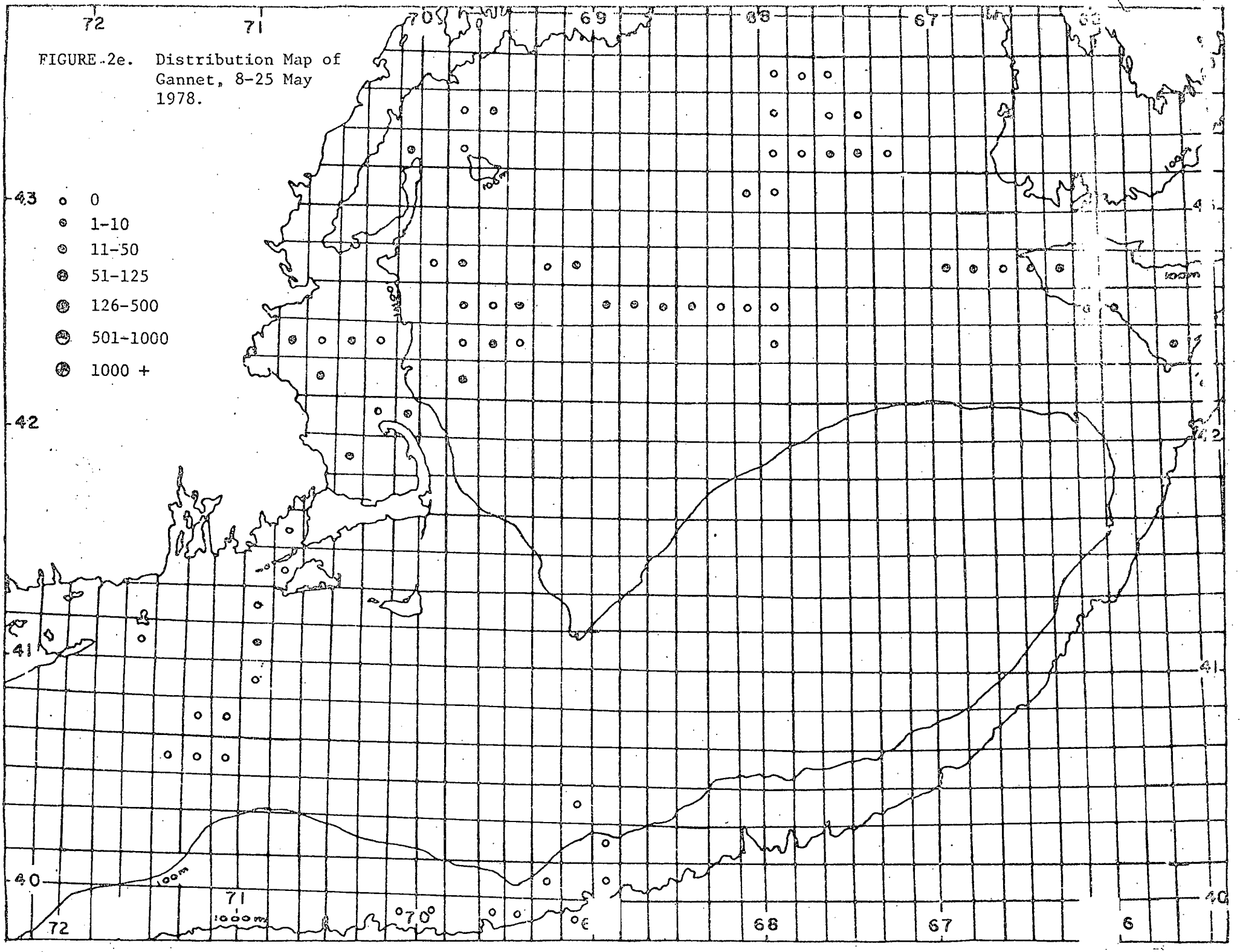

FIGURE 2e. Distribution Map of Gannet, 8-25 May 1978.

Cruise No. 7810

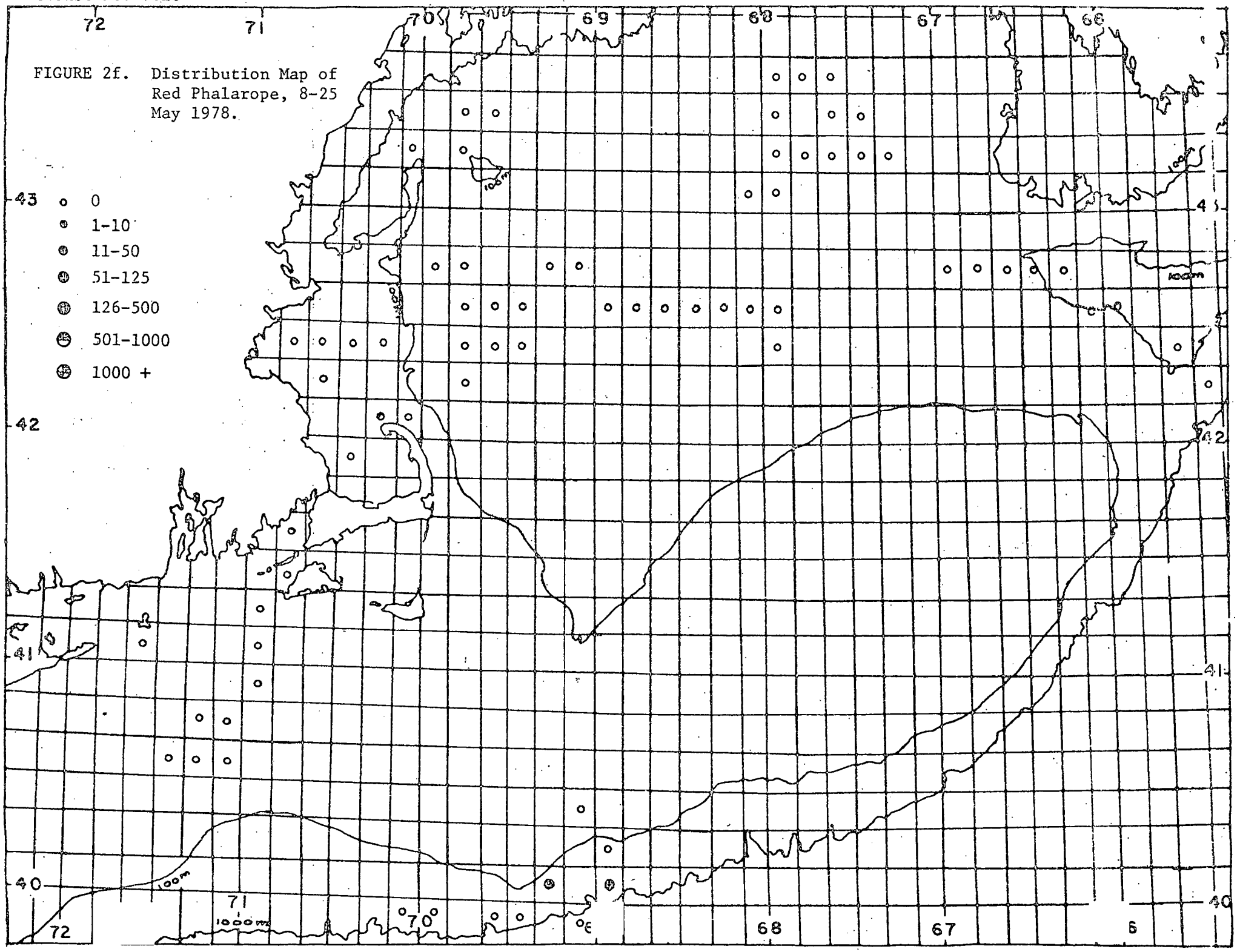

FIGURE 2f. Distribution Map of Red Phalarope, 8-25 May 1978.

Cruise No. 7810

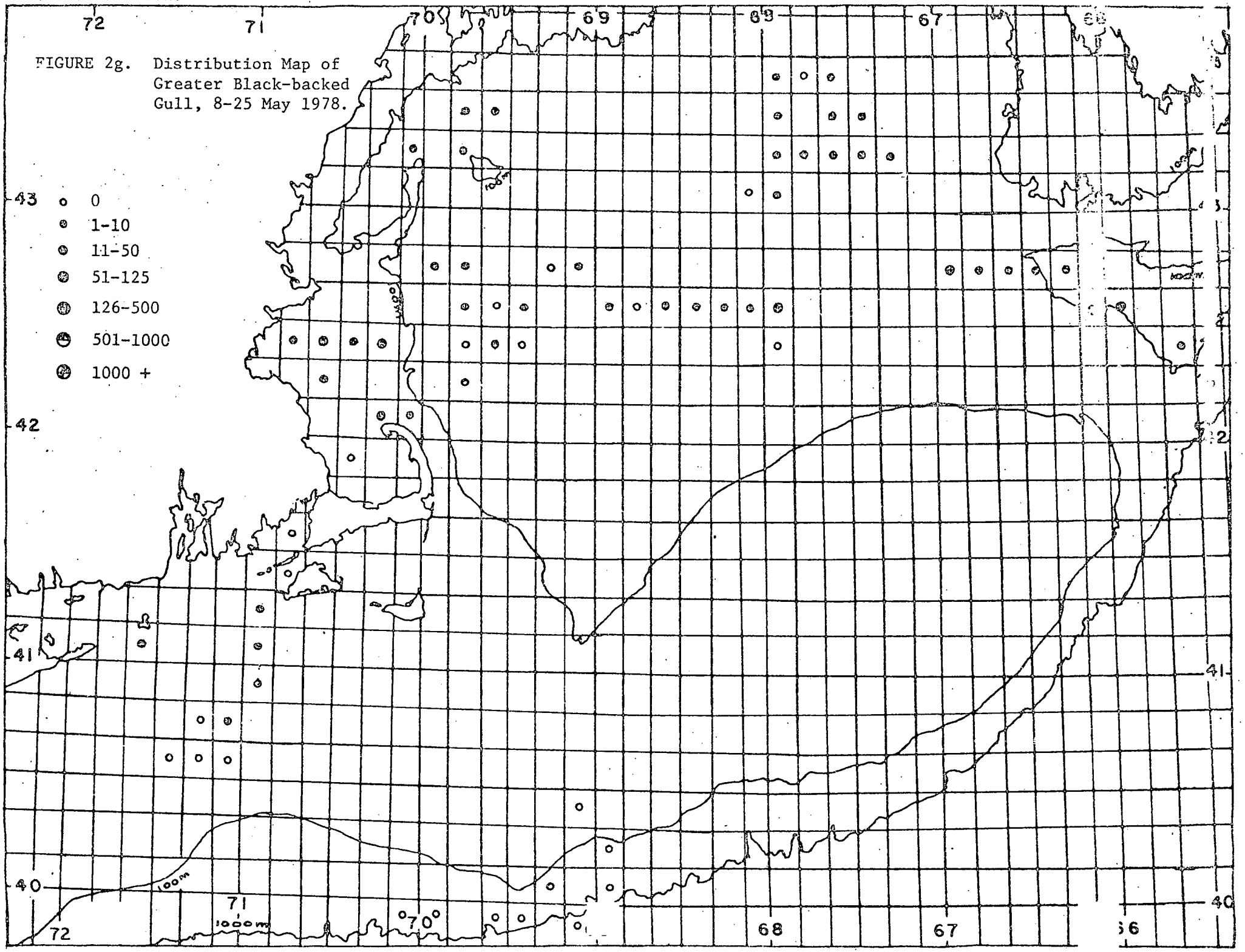

FIGURE 2g. Distribution Map of Greater Black-backed Gull, 8-25 May 1978.

Cruise No. 7810

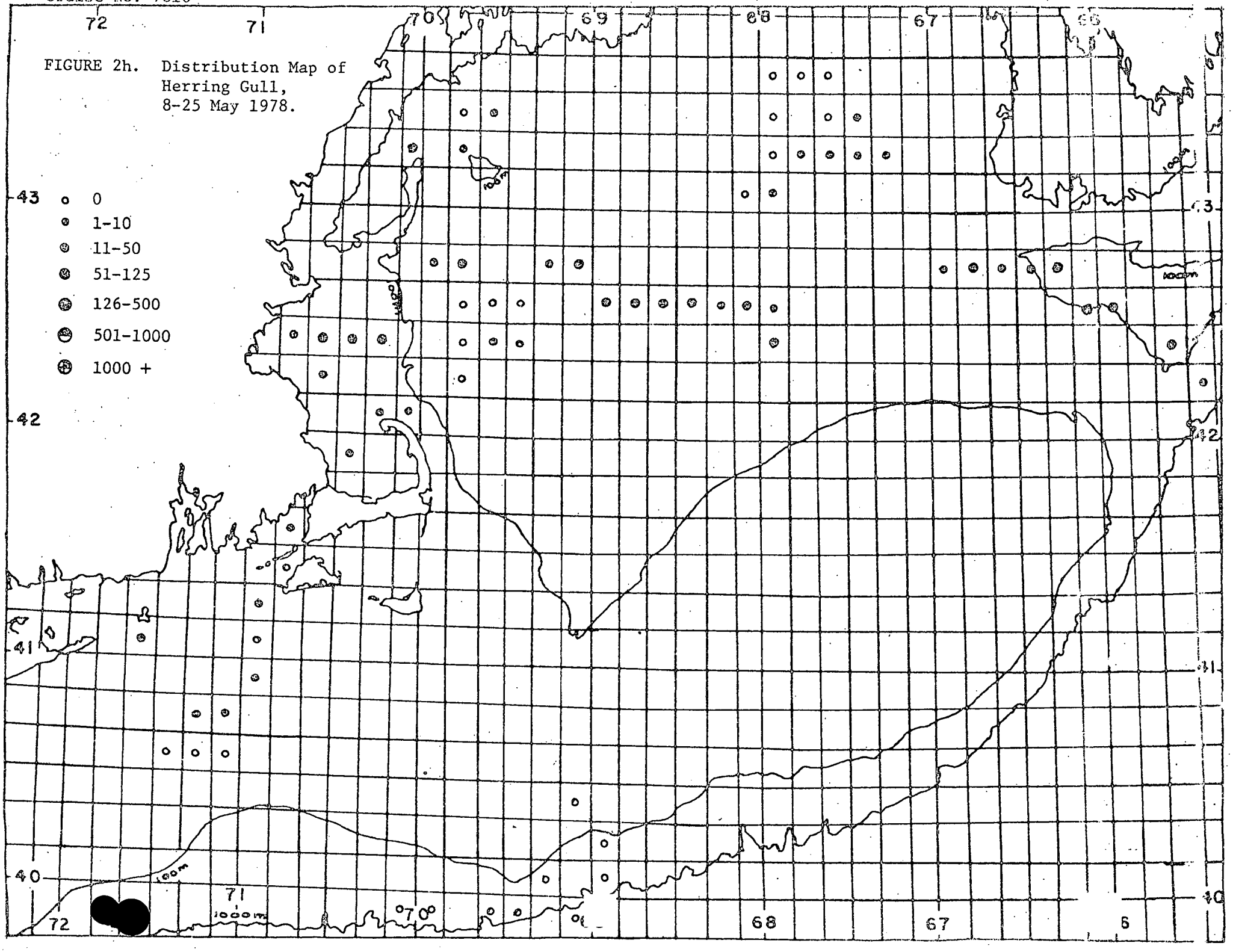

FIGURE 2h. Distribution Map of Herring Gull, 8-25 May 1978.

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

Sh ALBATROSS-III Observers Galen L. Pittman

Transect ☑ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date(GMT) MAY 1978	8	8	3	8	8	8	9	9	9	9	9	9	9	9	9
Region*	SC	NC	GM	NC	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM
Latitude(to nearest min.)	44-35	44-59	42-05	42-05	42-08	42-15	42-38	42-39	42-39	42-38	42-37	42-36	42-34	42-31	42-29
Longitude(to nearest min.)	70-02	70-21	70-19	70-07	70-01	69-46	68-55	68-46	68-39	68-31	68-22	68-11	68-07	68-04	67-57
Water depth(meters)	13	44	58	38	106	229	121	219	96	208	196	183	311	190	207
No. of Birds within Transect	1	2	21	7	1	4	3	1	2	0	2	4	0	2	0
Area Sampled(km^2)	1.11	1.16	1.16	1.16	1.16	0.97	1.01	1.07	1.02	0.97	0.97	0.97	0.70	0.74	0.51
Birds / km^2	0.90	1.72	18.10	6.03	0.86	4.12	2.80	0.93	1.96	0.00	2.06	4.12	0.00	2.70	0.00
Species	Number Observed														
Common Loon WT		1													
TOT		1													
Northern Fulmar WT						2	1	0	2	0	1	1	0	0	0
TOT						2	27	8	10	5	6	7	7	8	19
W. of Storm-Petrel WT													0	2	
TOT													2	2	
Unid. Storm-Petrel WT														0	0
TOT														2	1
Gannet WT		0			1	1	0	1	0	0	0				
TOT		1			1	1	2	1	1	1	1				
Herring Gull WT	1	1	9	5	0		2	0	0	0	0	1	0	0	0
TOT	1	1	9	5	1		23	26	26	25	14	7	11	2	10
Great Black-backed Gull WT			7	2	0		0		0		1	2	0	0	
TOT			7	2	1		2		1		1	2	1	1	
Unid. Gull WT		0	5	0	0	1	0								
TOT		2	10	330	1	1	4								
Unid. Tern WT	0														
TOT	3														

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

Sh[redacted] ALBATROSS-IV Observers Galen L. Pittma

Transect ☑ Station ☐ No.	16	17	18	19	20	21	22	23	24	25	26	[illegible]	28	29	30
Date(GMT) MAY 1982	9	9	10	10	10	10	10	10	10	10	10	10	10	10	11
Region*	GM	GM	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS
Latitude(to nearest min.)	42-38	42-36	42-46	42-44	42-41	42-43	42-43	42-45	42-41	42-37	42-35	42-34	42-32	42-36	42-25
Longitude(to nearest min.)	67-56	67-54	66-55	66-54	66-48	66-41	66-34	66-27	66-18	66-08	66-02	65-59	65-50	65-52	65-37
Water depth(meters)	223	196	196	196	159	157	157	112	79	69	108	115	86	84	128
No. of Birds within Transect	20	0	0	1	15	2	4	10	0	4	0	0	4	0	0
Area Sampled(km^2)	0.56	0.56	0.51	0.44	0.97	0.93	0.88	0.74	0.97	0.56	0.56	0.56	0.82	0.74	1.07
Birds / km^2	35.71	0.00	0.00	2.17	15.46	2.15	4.55	13.51	0.00	7.14	0.00	0.00	4.82	0.00	0.00
Species	Number Observed														
Northern Fulmar WT	5	0	0	0	0	0	0	2	0	2	0	0	3	0	0
TOT	25	60	23	20	21	41	25	32	20	12	10	21	28	50	20
Sooty Shearwater WT													0		
TOT													1		
Wi[illegible] Storm-Petrel WT	15	0	0	0	15	1		3					1	0	0
TOT	45	60	3	4	15	1		3					2	2	1
Gannet WT				0		0		4	0	0	0	0	0	0	
TOT				3		1		4	1	1	1	1	2	3	
Herring Gull WT	0	0	0	1	0	0	2	1	0	0	0	0	0	0	0
TOT	3	3	8	3	13	10	9	7	11	18	18	19	28	21	3
Great Black-backed Gull WT	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0
TOT	6	12	7	20	5	1	3	6	5	29	50	34	40	10	3
Black-legged Kittiwake WT				0											
TOT				2											
Unid. Gull WT				0		0	0		0						
TOT				30		30	21		30						
Unid. Tern WT				0		1									
TOT				3		1									
Unid. XX WT					0					0			0	0	
TOT					150					150			30	100	
Unid. Bird WT								0				0			
TOT								50				75			

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

S ALBATROSS IV Observers [illegible]

Transect ☑ Station ☐ No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Date (GMT) MAY 1978	11	11	11	11	11	11	11	11	11	11	12	12	12	12	12
Region*	WNS	WNS	WNS	WNS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
Latitude (to nearest min.)	42-21	42-17	42-21	42-20	42-16	42-27	42-32	42-37	42-43	42-50	42-43	42-45	42-49	42-51	42-58
Longitude (to nearest min.)	65-32	65-28	65-18	65-17	65-10	65-09	65-09	65-02	64-58	64-53	64-11	64-03	63-56	63-46	63-43
Water depth (meters)	97	112	113	130	126	115	110	106	106	108	93	326	185	154	144
No. of Birds Within Transects	3	0	0	3	1	0	0	0	1	0	0	1	6	15	0
Area Sampled (km^2)	0.88	0.46	0.93	0.93	0.97	0.97	1.02	1.02	1.02	1.02	1.07	0.93	0.97	1.07	0.93
Birds / km^2	3.41	0.00	0.00	3.23	1.03	0.00	0.00	0.00	0.98	0.00	0.00	1.08	6.19	14.02	0.00
Species	Number Observed														
Northern Fulmar WT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
TOT	25	45	60	68	25	30	40	55	45	100	20	30	58	50	40
Sooty Shearwater WT												0	0	0	0
TOT												2	1	1	1
U Shearwater WT					1	0									
TOT					1	1									
Wilson's Storm-Petrel WT	3	0	0	2	0	0	0			0	0	1	5	15	0
TOT	3	5	10	3	1	1	5			3	4	6	20	25	10
Gannet WT	0	0		1				0		0		0	0		
TOT	1	2		1				1		1		1	1		
Unid. Phalarope WT		0													
TOT		2													
Herring Gull WT	0	0	0	0	0	0	0	0	0	0	0		0	0	0
TOT	20	6	20	15	10	7	3	62	35	3	2		1	13	8
Great Black-backed Gull WT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT	5	4	40	1	3	2	2	35	19	0	3	2	4	12	8
Black-legged Kittiwake WT					0										
TOT					1										
Unid. Gull WT											0				
TOT											3				
U. Tern WT									1						
TOT									1						

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

Sh[redacted] ALBATROSS-IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Date(GMT) MAY 1978	12	12	12	12	12	12	12	12	12	13	13	13	13	13	13
Region*	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
Latitude(to nearest min.)	43-06	43-04	43-07	43-09	43-06	43-04	42-59	43-02	43-04	43-40	43-44	43-49	43-54	43-57	44-01
Longitude(to nearest min.)	63-39	63-40	63-53	64-00	64-08	64-14	64-25	64-26	64-26	63-50	63-43	63-36	63-39	63-45	63-46
Water depth(meters)	150	148	102	90	88	88	110	130	132	129	133	241	236	185	190
No. of Birds Within Transects	0	2	0	1	0	200	20	38	66	3	5	0	3	3	4
Area Sampled(km^2)	1.07	1.07	1.02	1.02	1.07	1.02	1.02	1.02	1.02	0.97	0.97	1.07	1.07	1.02	1.02
Birds / km^2	0.00	1.87	0.00	0.98	0.00	196.08	19.61	37.25	64.71	3.09	5.15	0.00	2.80	2.94	3.92
Species	Number Observed														
Northern Fulmar WT	0	1	0	0	0	0	0	1	18	0	2	0	2	2	2
TOT	60	33	20	20	12	5	15	12	63	15	5	10	9	52	52
Sooty Shearwater WT	0								1						
TOT	1								1						
Wilson's Storm-Petrel WT		1	0	0	0	200	20	37	45	1	1		1	1	2
TOT		16	5	5	45	700	30	37	85	1	1		1	17	17
Gannet WT				1											
TOT				1											
Herring Gull WT	0	0	0	0	0	0	0			0	0	0	0	0	0
TOT	8	18	7	7	3	15	70			7	15	15	10	60	60
Great Black-backed Gull WT	0	0	0	0	0	0	0		2	0	0	0	0	0	0
TOT	30	18	5	7	5	5	30		2	5	10	13	9	40	41
Unid. Gull WT									0	2		0	0		
TOT									10	22		35	25		
Unid. Tern WT											2				
TOT											2				
Unid XX WT				0				0	0						
TOT				30				200	100						
Unid. Bird WT													0		
TOT													1		

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

Sh ALBATROSS-IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Date(GMT) MAY 1978	13	13	13	13	13	13	14	14	14	14	16	16	16	16	16
Region*	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	WNS	WNS	WNS	WNS	WNS
Latitude(to nearest min.)	44-08	44-14	44-05	44-02	43-55	43-54	43-21	43-20	43-16	43-10	44-06	44-07	44-07	44-09	44-10
Longitude(to nearest min.)	63-40	63-38	63-44	63-53	63-57	63-58	64-41	64-50	65-04	64-54	67-14	67-04	66-55	66-50	66-40
Water depth(meters)	154	135	154	174	172	176	66	79	89	148	199	152	176	154	77
No. of Birds Within Transects	5	0	0	3	2	2	0	6	4	3	0	0	0	1	10
Area Sampled(km^2)	1.02	1.07	1.07	1.07	0.51	0.46	1.07	1.11	1.02	1.11	0.93	0.93	0.97	0.97	1.02
Birds / Km^2	4.90	0.00	0.00	2.80	3.92	4.35	0.00	5.41	3.92	2.70	0.00	0.00	0.00	1.03	9.80
Species	Number Observed														
Northern Fulmar WT	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT	41	20	10	5	20	40	25	10	5	10	35	50	15	3	5
Sooty Shearwater WT												0			
TOT												1			
Wilson's Storm-Petrel WT	2	0		2	2	2	0	0	0	3		0			
TOT	9	2		2	36	7	3	1	1	13		1			
Gannet WT						0									
TOT						2									
Herring Gull WT	0	0	0	0	0	0	0	2	3	0		0		0	0
TOT	42	50	27	25	1	24	15	3	4	18		14		2	9
Great Black-backed Gull WT	2	0	0	0	0	0	0	3	0	0	0	0		1	1
TOT	30	32	12	5	1	10	19	3	2	15	4	4		3	1
Laughing Gull WT			0												
TOT			1												
Black-legged Kittiwake WT												0			
TOT												1			
Unid. Gull WT					0	0		1							
TOT					30	10		1							
Common Tern WT				1											
TOT				1											
C[illegible] Alcid WT									1						
TOT									1						
Unid. XX WT			0	0			0								
TOT			45	30			30								

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

S ALBATROSS IV Observers Galen L. Pittman

Transect ☐ Station ☐ No.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Date(GMT) MAY 1978	16	16	16	16	16	16	16	16	16	19	19	19	19	19	20
Region*	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	WNS	GM	GM	GM	GM	GM	GM
Latitude(to nearest min.)	44-07	44-08	44-14	44-21	44-25	44-31	44-35	44-40	44-41	43-17	43-14	43-12	43-20	43-22	43-28
Longitude(to nearest min.)	66-37	66-21	66-30	66-30	66-30	66-22	66-18	66-10	66-15	70-08	70-00	69-43	69-42	69-39	67-59
Water depth(meters)	91	75	86	198	205	174	146	119	137	137	129	101	157	191	247
No. of Birds Within Transects	0	0	0	60	2	1	3	1	1	0	9	0	9	1	37
Area Sampled(km^2)	1.07	1.02	1.07	0.97	1.11	1.16	1.11	1.07	1.07	1.07	1.07	0.83	1.11	1.07	0.83
Birds / km^2	0.00	0.00	0.00	61.86	1.80	0.86	2.70	0.93	0.93	0.00	8.41	0.00	8.12	0.93	44.58
Species	Number Observed														
Northern Fulmar WT				5	2			1		0		0	2	0	7
TOT				15	2			1		1		2	6	2	15
Wilson's Storm-Petrel WT															1
TOT															1
Go T WT							3		1	0				0	
TOT							3		1	1				1	
Double-crested Cormorant WT															4
TOT															4
Unid. Phalarope WT				55											
TOT				55											
Herring Gull WT	0	0	0	0	0	0	0	0	0	0	2	0		0	
TOT	2	25	26	25	29	29	20	10	2	25	2	1		6	
Great Black-backed Gull WT	0	0	0	0	0	0	0	0	0	0	1	0	5	1	0
TOT	1	13	10	15	7	1	1	3	1	10	5	2	5	1	1
Black-legged Kittiwake WT											0				
TOT											4				
Unid. Gull WT	0		0								1		2	0	25
TOT	1		45								1		8	25	27
Unid Tern WT											5				
TOT											10				
D...kie WT						1									
TOT						1									

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

Sh ALBATROSS-IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Date(GMT) MAY 1970	20	20	20	20	20	20	20	20	20	20	20	20	20	20	21
Region*	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM
Latitude(to nearest min.)	43-30	43-30	43-30	43-26	43-22	43-18	43-14	43-12	43-10	43-12	43-14	43-09	43-10	43-02	42-46
Longitude(to nearest min.)	67-54	67-46	67-30	67-30	67-23	67-16	67-21	67-28	67-39	67-48	67-53	67-50	67-49	68-01	69-09
Water depth(meters)	240	238	227	205	199	241	188	188	198	212	225	196	186	183	141
No. of Birds Within Transects	4	8	0	0	0	0	0	2	0	0	0	0	1	0	2
Area Sampled(km^2)	1.07	1.07	1.02	1.02	1.11	1.07	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.11	0.97
Birds / km^2	3.74	7.48	0.00	0.00	0.00	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.98	0.00	2.06
Species	Number Observed														
Common Loon WT															3
TOT															2
Unid. Loon WT		3													
TOT		3													
No. Fulmar WT	1	3	0		0		0	2	0	0	0	0	0	0	0
TOT	2	4	3		4		9	4	12	5	2	2	2	6	30
Sooty Shearwater WT															0
TOT															1
Wilson's Storm-Petrel WT	1	1				0				0	0		1		
TOT	1	2				1				1	1		1		
Unid. Storm-Petrel WT			0												0
TOT			2												1
Gannet WT							0		0						0
TOT							1		1						3
Herring Gull WT					0	0	0	0	0			0	0		0
TOT					1	10	2	1	5			1	2		13
Great Black-backed Gull WT	2		0	0	0	0	0		0		0	0			0
TOT	2		3	1	1	10	4		1		1	2			3
Laughing Gull WT						0									
TOT						1									
[illegible] Gull WT		1	0								0	0	0		
TOT		1	13								1	1	2		
Unid. XX WT															0
TOT															10

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

S: ALBATROSS - IV Observers Galen L. Pittman

Transect ☐ Station ☐ No.	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Date(GMT) MAY 1978	21	21	21	21	21	21	21	21	21	21	21	22	22	22	22
Region*	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM
Latitude(to nearest min.)	42-43	42-40	42-33	42-30	42-25	42-24	42-23	42-25	42-30	42-42	42-44	42-27	42-20	42-22	42-27
Longitude(to nearest min.)	69-08	69-19	69-28	69-34	69-30	69-28	69-38	69-44	69-43	69-48	69-55	70-17	70-20	70-26	70-34
Water depth(meters)	165	232	291	267	243	249	249	262	265	238	210	57	29	90	49
No. of Birds Within Transects	0	1	0	0	0	0	0	0	14	4	0	66	10	7	6
Area Sampled(km^2)	0.97	0.93	1.02	1.02	1.11	1.02	1.02	1.02	1.02	0.93	0.97	1.11	0.74	1.02	1.02
Birds / km^2	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	13.73	4.30	0.00	59.46	13.51	6.86	5.88
Species	Number Observed														
Common Loon WT		1													
TOT		1													
Northern Fulmar WT	0	0	0	0	0	0	0	0	6	0	0				
TOT	10	4	3	3	5	4	4	4	7	50	20				
Sooty Shearwater WT										0					
TOT										1					
Gannet WT	0		0		0		0			0				1	
TOT	2		1		1		1			1				1	
Unid Phalarope WT									1				1		
TOT									1				1		
Herring Gull WT	0	0			0					0	0	27	3	4	4
TOT	2	1			1					10	6	42	8	13	4
Great Black-backed Gull WT	0		0		0		0		0	0	0	9		2	2
TOT	1		1		1		2		1	6	2	14		2	2
Unid. Gull WT		0				0				4		30	2	0	0
TOT		4				6				9		200	10	14	300
Unid. Large Alcid WT													4		
TOT													4		
Unid. Bird WT	0		0						7						
TOT	1		2						7						

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

Sh ALBATROSS-TV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
Date(GMT) MAY 1978	22	22	22	22	22	23	23	23	23	23	23	23	23	23	23
Region*	GM	NC	GM	GM	NC	SC	SC	SC	SC	SNE	SNE	SNE	SNE	SNE	SNE
Latitude(to nearest min.)	42-28	42-28	42-26	42-18	42-13	41-40	41-36	41-28	41-19	41-10	41-04	40-58	40-52	40-47	40-42
Longitude(to nearest min.)	70-36	70-43	70-38	70-33	70-31	70-42	70-45	70-44	70-53	70-54	70-56	70-56	70-59	71-02	71-10
Water depth(meters)	79	51	82	55	53	9	13	21	26	27	37	49	53	53	55
No. of Birds Within Transects	1	3	6	3	5	12	2	2	1	3	2	57	1	0	0
Area Sampled(km²)	0.83	0.93	1.11	1.11	1.11	1.02	1.02	1.20	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Birds/km²	1.20	3.23	5.41	2.70	4.50	11.76	1.96	1.67	0.93	2.80	1.87	53.27	0.93	0.00	0.00
Species	Number Observed														
Common Loon WT							1								
TOT							5								
Unid. Loon WT											0				
TOT											1				
Gr[illegible] Shearwater WT														0	
TOT														1	
Sooty Shearwater WT										3		2	1	0	
TOT										3		19	1	2	
Gannet WT		1		1							1				
TOT		1		1							1				
Double-crested Cormorant WT							1	2							
TOT							1	2							
Unid. Duck WT						0									
TOT						1									
Unid. Phalarope WT											0			0	
TOT											20			4	
Herring Gull WT	0	1	4	0	2				1	0		0	0	0	0
TOT	20	1	4	1	4				1	4		3	1	9	1
Great Black-backed Gull WT	1	1	2	1	1	2			0		1			0	
TOT	22	1	2	1	1	2			1		1			1	
U[illegible] Gull WT	0		0	1	2		0	0		0	0			0	
TOT	100		2	6	5		4	1			1			5	
Unid. Tern WT						10	0					55			
TOT						25	1					55			
Unid. Bird WT						0							0		
TOT						2							1		

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

Sl ALBATROSS-IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	136	137	138	139	140	141	142	143	144
Date(GMT) MAY 1978	23	23	23	23	24	24	24	24	24
Region*	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE
Latitude(to nearest min.)	40-38	40-36	40-36	40-35	40-20	40-10	40-09	40-08	40-04
Longitude(to nearest min.)	71-15	71-23	71-16	71-00	69-06	68-57	68-51	68-56	68-57
Water depth(meters)	58	62	64	70	132	137	273	155	252
No. of Birds Within Transect	5	0	2	0	20	22	11	93	40
Area Sampled(km^2)	0.97	1.07	1.11	1.07	1.07	1.07	1.07	1.11	0.97
Bird / km^2	5.15	0.00	1.80	0.00	18.69	20.56	10.28	83.78	41.24
Species	Number Observed								
Northern Fulmar WT					1	0		2	
TOT					1	1		3	
Greater Shearwater WT					4	4	1	5	0
TOT					5	7	1	6	4
Sooty Shearwater WT							3		0
TOT							3		1
Unid. Shearwater WT					1				
TOT					1				
Wilson's Storm-Petrel WT					7	18	7	40	10
TOT					7	33	10	50	40
Unid. Storm-Petrel WT			1						
TOT			1						
Red Phalarope WT								40	30
TOT								40	30
Unid. Phalarope WT	5				7				
TOT	5				7				
Unid Skua WT						0			
TOT						1			
Pomarine Jaeger WT			1						
TOT			1						
Herring Gull WT		0							
TOT		1							
Unid. Alcid WT								6	
TOT								6	
Unid. Bird WT								0	
TOT								20	

Cruise No. 7810

TABLE 6. Summary of Transect or Station Census Data.

S ALBATROSS-IV Observers Galen L. Pittman

Transect ☑ Station ☐ No.	145	146	147	148	149	150	151	152	153
Date(GMT) MAY 1978	24	24	24	24	24	24	25	25	25
Region*	OO	SNE	SNE	SNE	SNE	SNE	SNE	SC	SC
Latitude(to nearest min.)	39-58	40-02	39-55	39-55	39-56	39-57	40-34	41-08	41-07
Longitude(to nearest min.)	69-03	69-15	69-29	69-37	69-50	70-02	71-14	71-32	71-30
Water depth(meters)	380	148	358	291	263	218	66	31	22
No. of Birds Within Transects	4	15	501	1	63	4	2	12	3
Area Sampled(km^2)	1.07	1.07	1.02	1.07	1.02	1.07	1.07	1.02	1.02
Birds / km^2	3.74	14.02	491.18	0.93	61.76	3.74	1.87	11.76	2.94
Species	Number Observed								
Northern Fulmar WT	0		1				1		
TOT	1		1				1		
Greater Shearwater WT	0	0		1	30	1		1	
TOT	4	3		1	31	5		1	
Sc Shearwater WT	0	1			12	1	1	5	1
TOT	1	4			12	1	1	13	5
Unid. Shearwater WT					0	0		0	
TOT					2	1		12	
Wilson's Storm-Petrel WT	4	2	500		13	0		1	
TOT	9	4	1000		16	7		1	
Unid. Storm-Petrel WT									2
TOT									2
Red Phalarope WT		11							
TOT		11							
Herring Gull WT								3	0
TOT								6	2
Great Black-backed Gull WT								2	0
TOT								2	1
Unid. Gull WT								0	0
TOT								25	3
Unid. Tern WT		1			8	2			
TOT		1			8	2			

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 26 May - 12 June 1978

Cruise No. 7811

INTRODUCTION

The following report summarizes bird and mammal observations made by Albert W. Nickerson, Staff Biologist, Manomet Bird Observatory, aboard USCGC VIGILANT from 26 May to 12 June 1978. The objectives of the patrol were offshore fisheries law enforcement, search and rescue. The observer was aboard on a non-interference basis primarily to collect information on distribution, abundance and behavior of marine birds.

The Manomet Bird Observatory gratefully acknowledges the cooperation of the U.S. Coast Guard for allowing an observer to join the patrol. The observer thanks CMR Ian S. Cruickshank, the officers and crew of USCGC VIGILANT for their friendly assistance aboard ship. Financial support for MBO seabird studies is provided by the U.S. Department of Energy under 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 rela-

tive 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 coastal and marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours and Figure 2a-g indicates the distribution of seven bird species using the greatest total bird count of each species per 10-minute square latitude/longitude block surveyed.

This patrol reached such wide ranging areas as Passamaquoddy Bay, Eastern Nova Scotia and New York Harbor but observations were concentrated on the northern edge of Georges Bank and on Jeffrey's Ledge and Stellwagen Bank on the eastern side of the Gulf of Maine due to the ship's fisheries patrol mission.

Greater and Sooty Shearwaters and Northern Fulmars were observed to be widely distributed during the cruise, but were concentrated in the areas where fishing trawlers were present (i.e. Northern Edge of Georges Bank and Jeffrey's Ledge in the Gulf of Maine. Two effects may exist: a) fish (therefore fisher-

men) and birds are attracted to the same areas because oceanographic conditions and biological activity make the areas attractive to both, or b) birds are attracted directly to the trawlers because of offal. Two observations suggest that the latter effect predominates. First, two transects were made during the cruise directly through "Fishing Area Five" on southern Georges Bank where enormous concentrations of tubenoses were observed at the same time last year (see M.B.O. Cruise No. 7713) in association with a Soviet fishing fleet. This year, with the fleet gone, abundance did not appear to be any greater than in other unfished areas of the bank. Second, in fished areas tubenoses were observed actively feeding on offal from the nets. In unfished areas tubenoses were never observed feeding "naturally." On three occasions on the Northern Edge over 1,000 fulmars, Greater and Sooty Shearwaters were seen sitting, flying and feeding around single small trawlers. Some birds were too burdened with food to fly. Skuas were sighted on five occasions. One was unidentified; one was believed to be a Great Skua; and three were identified as South Polar Skuas. Two South Polar Skuas were photographed, and were identifiable in the resulting slides.

TABLE 1.

Seabird Density in Selected Regions in Fixed Area Transects
26 May - 12 June 1978

REGION	NUMBER OF TRANSECTS	TOTAL KM^2 SURVEYED (TKM^2)	TOTAL BIRDS (TB)	MEAN DENSITY (TB/TKM^2)	DENSITY RANGE (TB/KM^2/TRANSECT)
Southern New England	5	7.43	21	2.83	0- 10.77
Georges Bank	24	27.98	4001	142.99	0-1818.2
Gulf of Maine	40	41.27	1032	25.01	0- 171.9
W. Nova Scotia	5	6.50	62	9.54	4.62- 13.85
North Coastal	4	4.64	34	7.33	0- 27.27
Off Continental Shelf	8	9.86	55	5.58	0- 25.39

TABLE 2.

Number of Birds Per Species in Selected Regions
(Using Fixed-Area Counts Only)
26 May - 12 June 1978

SPECIES	SOUTHERN NEW ENGLAND	GEORGES BANK	GULF OF MAINE	WESTERN NOVA SCOTIA	NORTHERN COASTAL	OFF CONT. SHELF
Northern Fulmar		196	85		8	2
Greater Shearwater	3	2564	26	27	15	21
Sooty Shearwater	6	918	23	3	2	1
Leach's Storm-Petrel			78	16		1
Wilson's Storm-Petrel	5	300	674	4		11
annet			2	2		
Red Phalarope		20	33	9		19
Pomarine Jaeger		1				
Great Black-backed Gull	3	1	5		1	
Herring Gull	4		102			
Arctic Tern			3			
Unid. tern			1	1	8	
Common Puffin		1				

TABLE 3.

List of Rare or Infrequent Bird Sightings
26 May - 12 June 1978

SPECIES	NUMBER	DATE	LOCATION	REMARKS
Common Loon	6	28 May	44°42'N, 67°07'W	Flying SE
Red-throated Loon	1	30 May	42°38'N, 69°41'W	Flying
Manx Shearwater	1	04 June	40°00'N, 67°00'W	In flock of tube-noses
Manx Shearwater	1	09 June	42°56'N, 69°50'W	Flying
Gannet	1	26 May	41°55'N, 70°22'W	Subadult
Gannet	1	29 May	43°47'N, 68°05'W	Subadult
Gannet	1	06 June	43°16'N, 65°30'W	Subadult
Gannet	1	10 June	42°45'N, 70°15'W	Subadult
Double-crested Cormorant	5	29 May	43°40'N, 68°28'W	Traveling SW
Common Eider	25	28 May	In Friar Roads, Eastport, Maine	Mixed flock
Common Eider	6	28 May	44°39'N, 67°07'W	Subadult males
White-winged Scoter	6	30 May	42°18'N, 70°11'W	On water, flew
Red Phalarope	20	31 May	41°03'N, 67°24'W	Flock traveling north
Red Phalarope	15	31 May	41°03'N, 67°24'W	Traveling north
Red Phalarope	23	01 June	40°27'N, 67°12'W	Flying
Red Phalarope	5	06 June	42°35'N, 66°50'W	Traveling SW
Red Phalarope	10	06 June	42°38'N, 66°43'W	Traveling NW
Red Phalarope	5	06 June	42°42'N, 66°45'W	Traveling north
Red Phalarope	9	06 June	42°46'N, 66°27'W	Traveling NW
Red Phalarope	35	06 June	43°03'N, 65°57'W	Traveling NE

(continued)

Cruise No. 7811

TABLE 3. (continued)

SPECIES	NUMBER	DATE	LOCATION	REMARKS
Northern Phalarope	ca.5000	28 May	In Friar Roads, Eastport, Maine	
Pomarine Jaeger	1	31 May	41°08'N, 67°30'W	Light phase adult
Pomarine Jaeger	1	03 June	40°19'N, 72°25'W	Imm. traveling E
Pomarine Jaeger	1	04 June	42°07'N, 67°06'W	Light phase adult
Northern Skua	1	05 June	41°52'N, 67°23'W	Bulky, brownish
South Polar Skua	1	04 June	42°00'N, 67°00'W	Dark phase, well photographed
South Polar Skua	1	05 June	41°45'N, 68°15'W	Dark phase
Skua spp.	1	01 June	40°27'N, 67°42'W	Distant-small and dark
Skua spp.	1	01 June	40°27'N, 67°51'W	Photographed. Similar poss., same bird
Iceland Gull	1	30 May	42°26'N, 70°24'W	First winter
Black-legged Kittiwake	5	06 June	43°16'N, 65°30'W	Immature
Black-legged Kittiwake	7	11 June	42°17'N, 70°15'W	Immature
Common Tern	2	02 June	40°29'N, 72°30'W	Flying
Arctic Tern	3	29 May	43°44'N, 68°11'W	Flying adults
Tern spp.	3	28 May	44°39'N, 67°07'W	Traveling SE
Tern spp.	1	29 May	43°40'N, 68°28'W	Flying
Tern spp.	1	30 May	42°40'N, 70°21'W	Flying
Tern spp.	2	05 June	42°05'N, 67°38'W	Traveling north
Tern spp.	1	06 June	42°46'N, 66°27'W	Flying
Tern spp.	8	06 June	43°12'N, 65°39'W	Flying
Razorbill	1	28 May	44°27'N, 67°06'W	Traveling NW
Common Puffin	1	06 June	42°08'N, 67°39'N	Breeding plumage, Traveling north

(concluded)

TABLE 4.

List of Marine Mammal Sightings
26 May - 12 June 1978

SPECIES	NUMBER	DATE	LOCATION	REMARKS
Fin Whale	1	30 May	42°18'N, 70°11'W	Surfaced, spouted
Unid. rorqual	3	30 May	42°24'N, 70°22'W	Surfaced, showed arched back, spouted, rolled showing white side, put flukes out, sounded.
Unid. rorqual	1	30 May	42°39'N, 70°23'W	Spouted 3 X, tall and thin.
White-sided Dolphins	30	01 June	40°32'N, 65°29'W	Porpoising, going east.
Pilot Whales	8	01 June	40°29'N, 68°31'W	Passing ship, going east.
Unid. dolphin	ca.10	01 June	40°31'N, 68°50'W	Near huge concentrations of bait fish.
Pilot Whales	2	05 June	41°43'N, 67°17.5'W	Distant
Humpback Whale	1	05 June	42°05'N, 67°38'W	Repeatedly spouts, slaps surface with flukes
Humpback Whale	1	05 June	41°45'N, 68°15'W	Flukes out, sounded.
Pilot Whales	6	06 June	42°30'N, 67°00'W	Going SW
Unid. whale	1	06 June	42°38'N, 66°43'W	Spout
Common Dolphin	6	06 June	43°16'N, 65°30'W	Porpoising
Fin Whales	3-5	10 June	42°50'N, 70°09'W	While ship was circling, several appeared in various postures over three hours.
Unid. rorqual	2	11 June	42°17'N, 70°17'W	Spouted, showed dorsal fin, then flukes. Irregular white spotting at tips of underside of flukes.
Unid. rorqual	1	11 June	42°17'N, 70°17'W	Same appearance as above.
Unid. whale	1	11 June	42°21'N, 70°22'W	Spout, low and bushy.

TABLE 5.

List of Non-Marine Bird Sightings
26 May - 12 June 1978

SPECIES	NUMBER	DATE	LOCATION	REMARKS
Northern Waterthrush	1	01 June	40°27'N, 67°42'W	Circling ship
Barn Swallow	1	10 June	43°01'N, 69°54'W	Flying

Cruise No. 7811

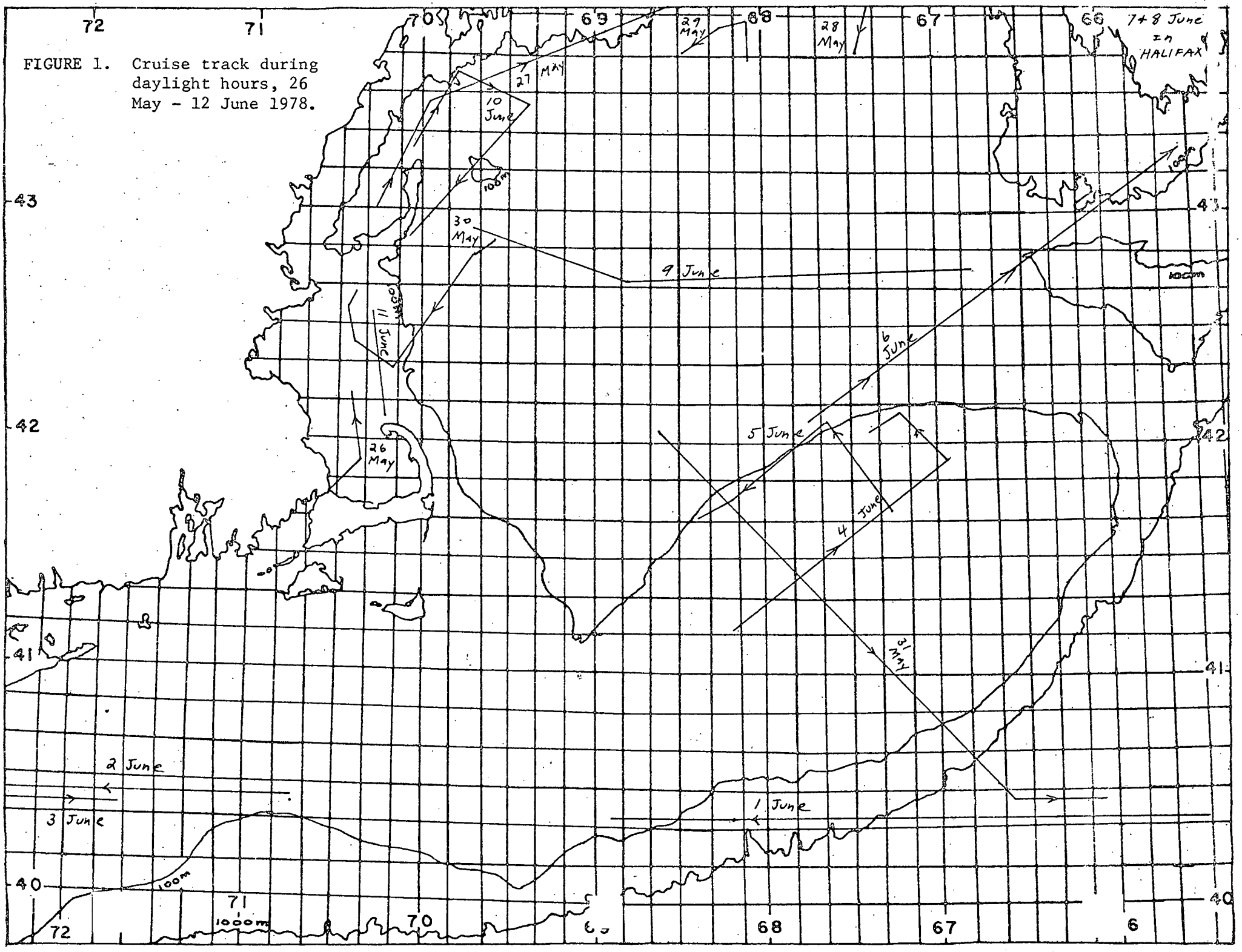

FIGURE 1. Cruise track during daylight hours, 26 May - 12 June 1978.

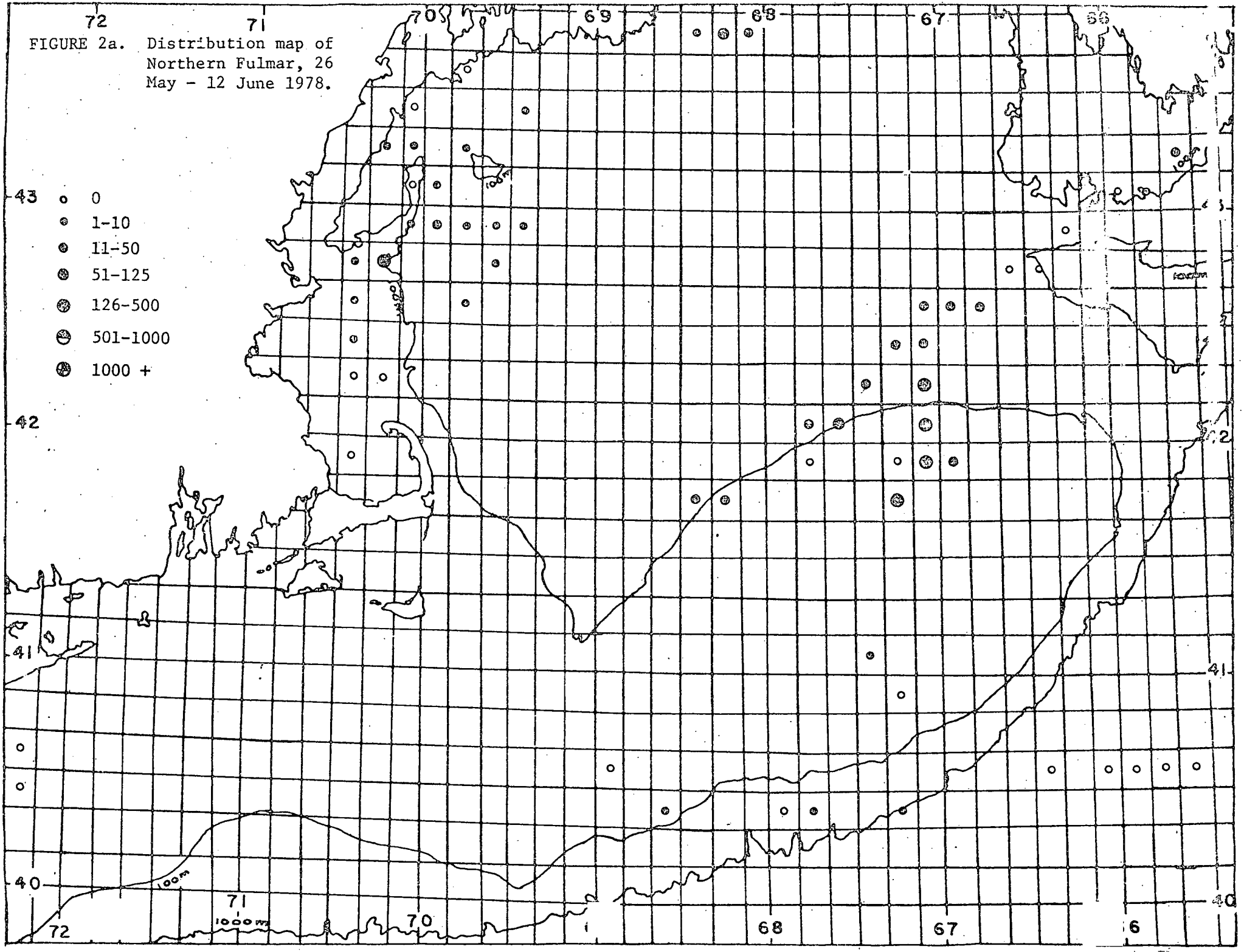

FIGURE 2a. Distribution map of Northern Fulmar, 26 May - 12 June 1978.

Cruise No. 7811

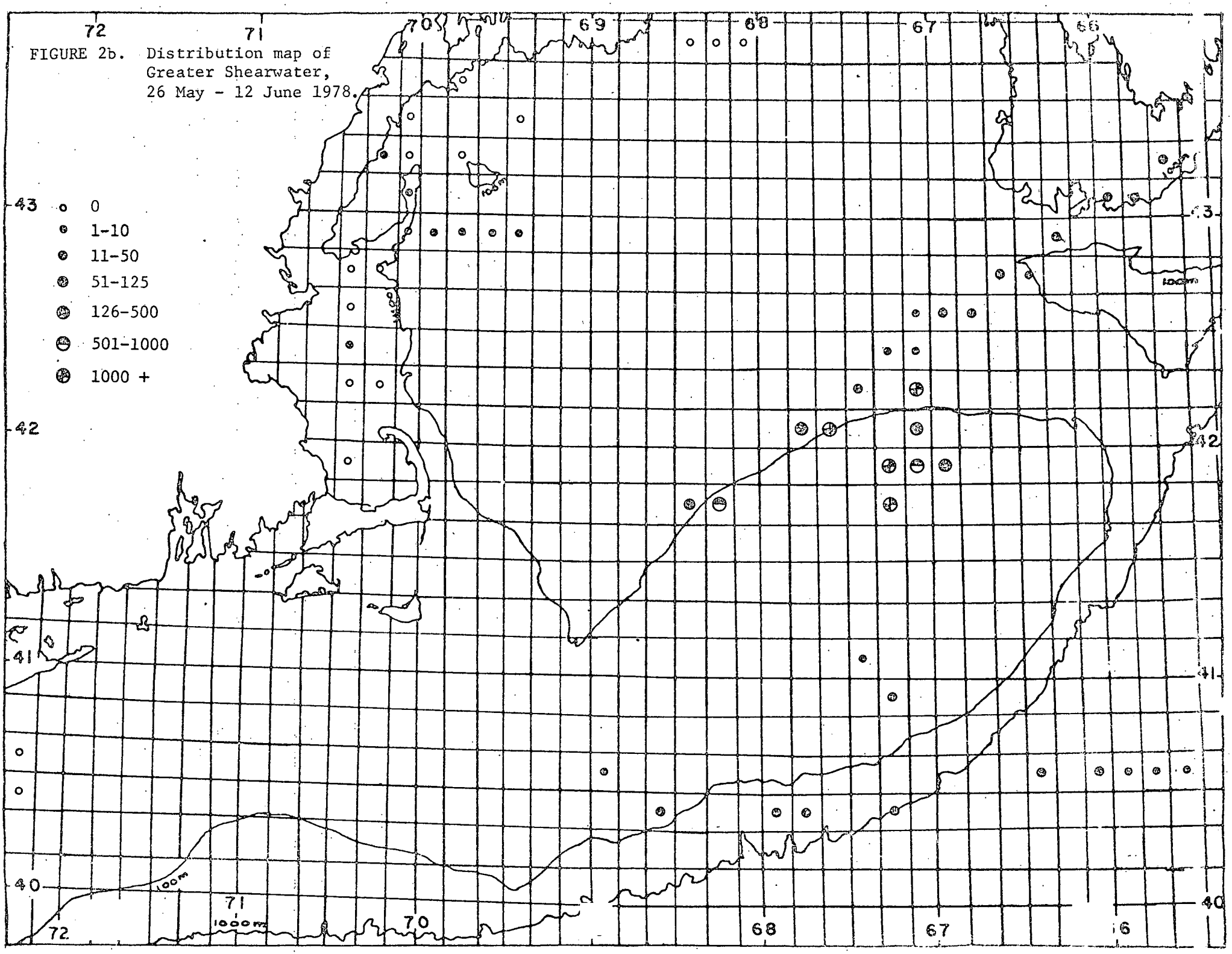

FIGURE 2b. Distribution map of Greater Shearwater, 26 May - 12 June 1978.

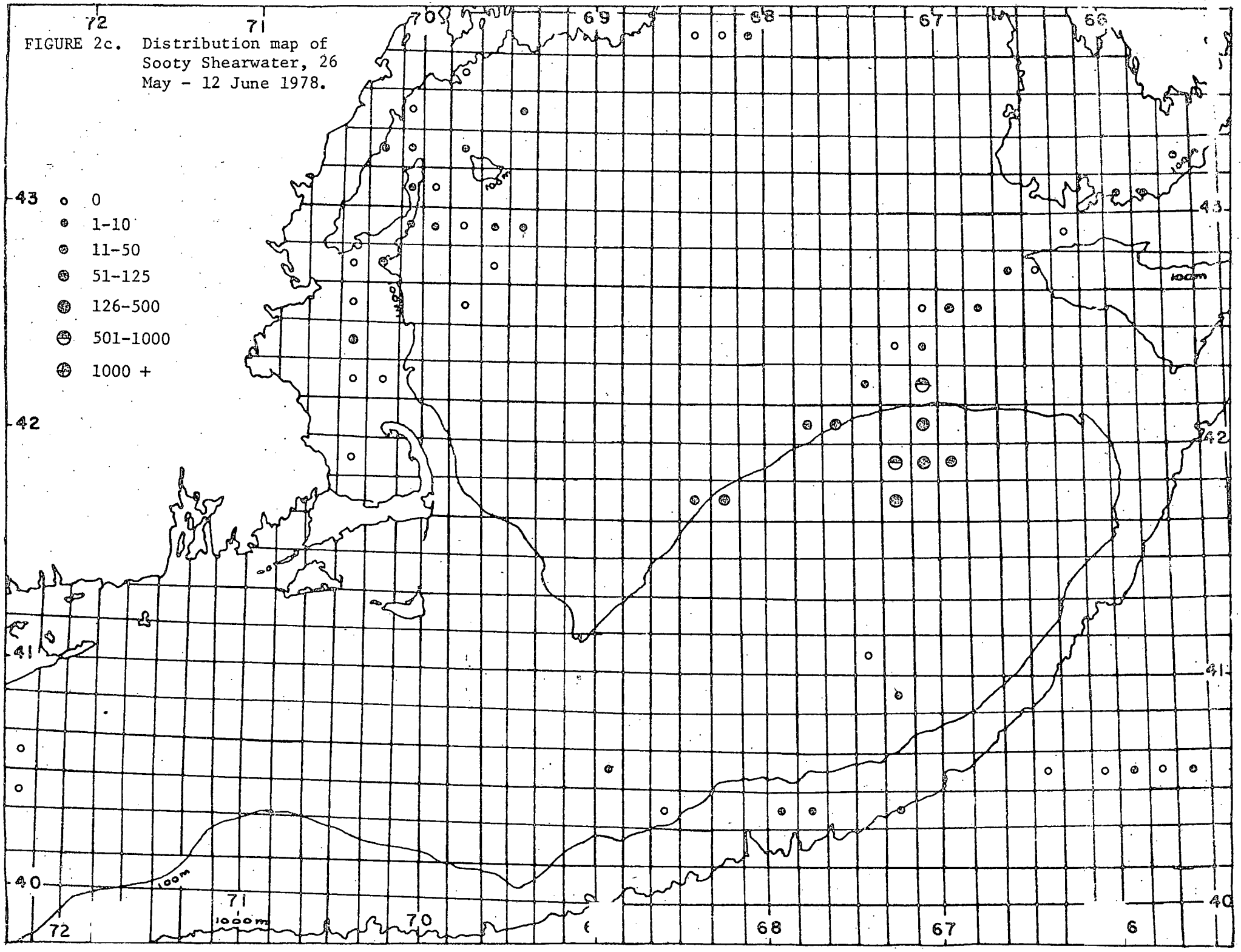

FIGURE 2c. Distribution map of Sooty Shearwater, 26 May - 12 June 1978.

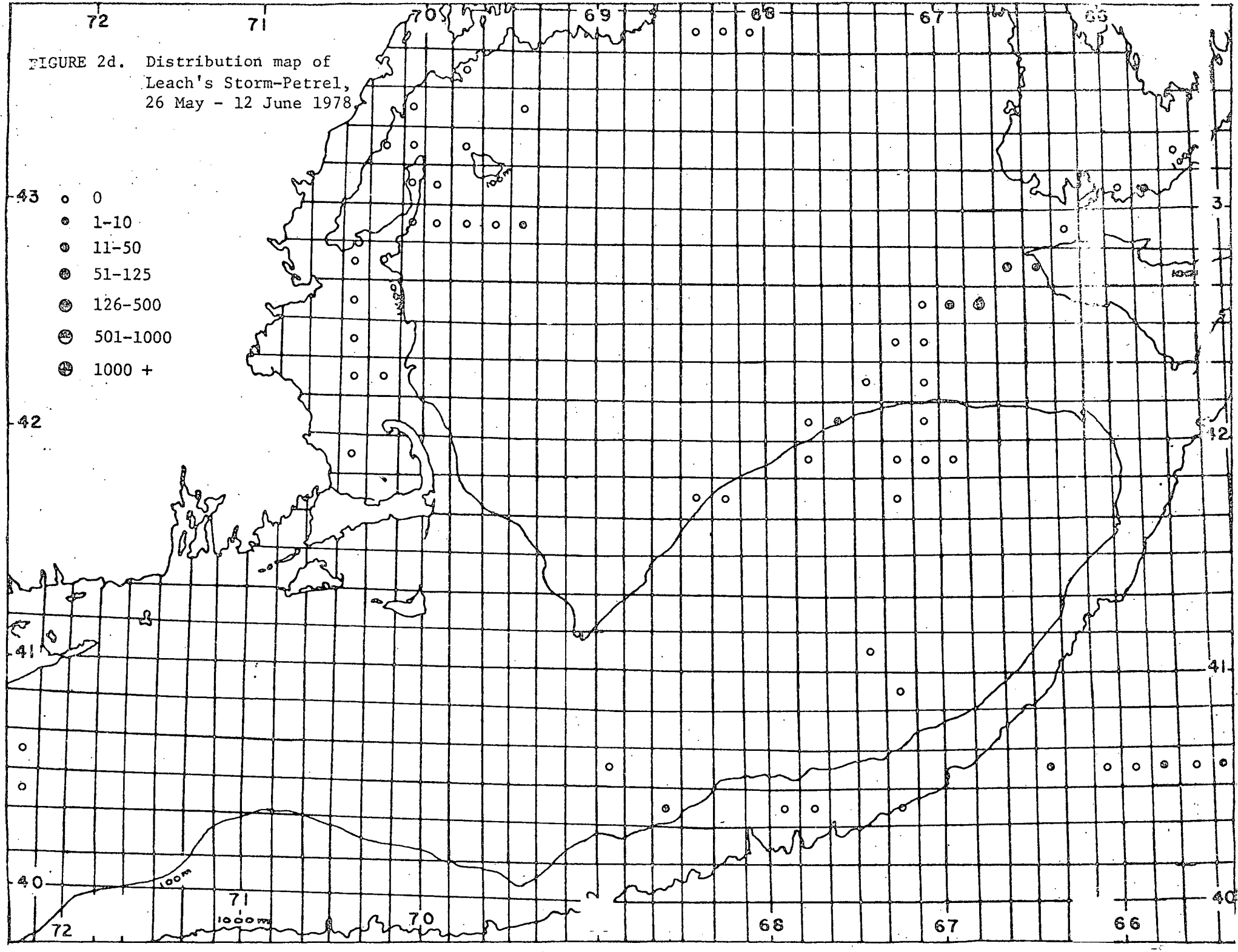

FIGURE 2d. Distribution map of Leach's Storm-Petrel, 26 May - 12 June 1978

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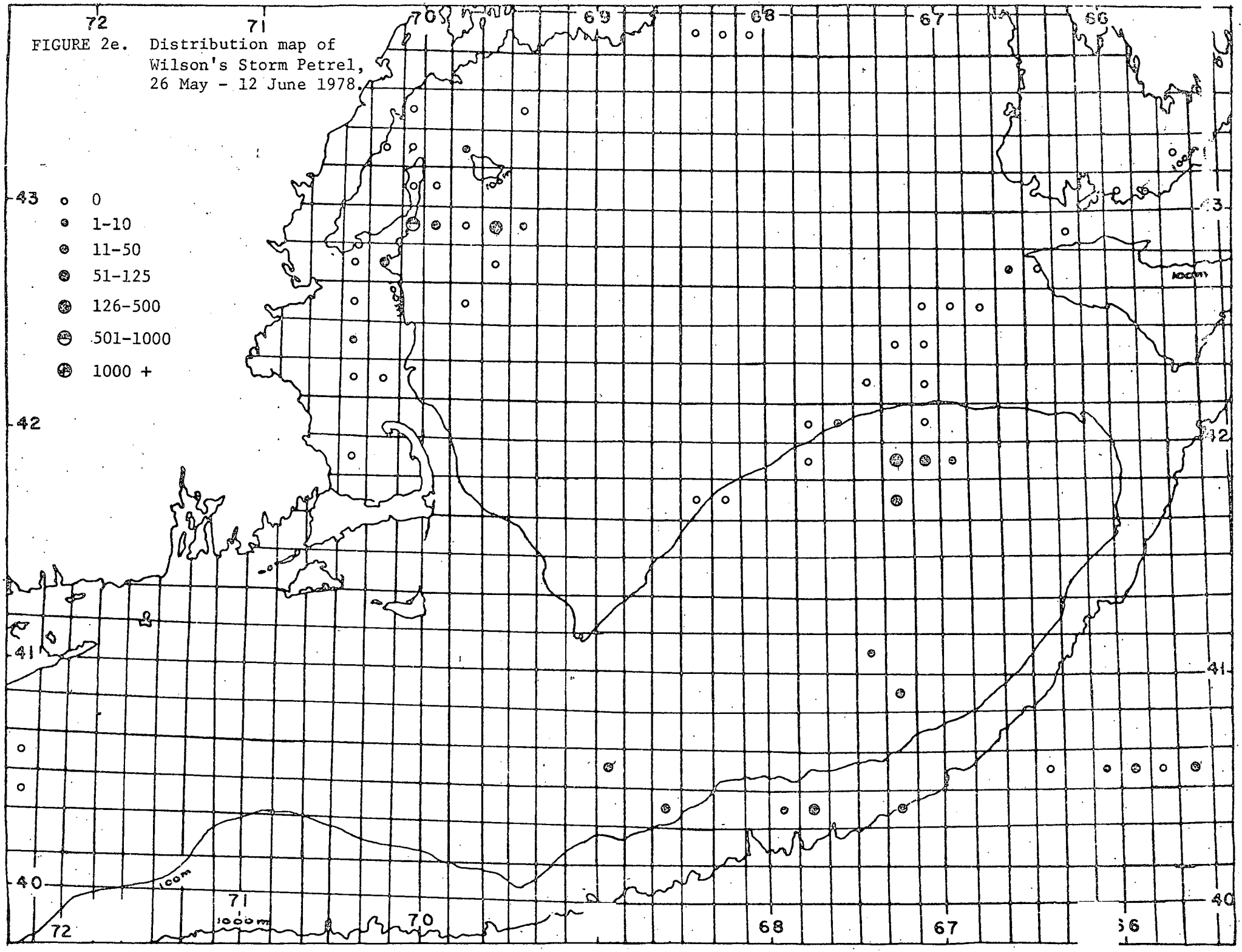

FIGURE 2e. Distribution map of Wilson's Storm Petrel, 26 May - 12 June 1978.

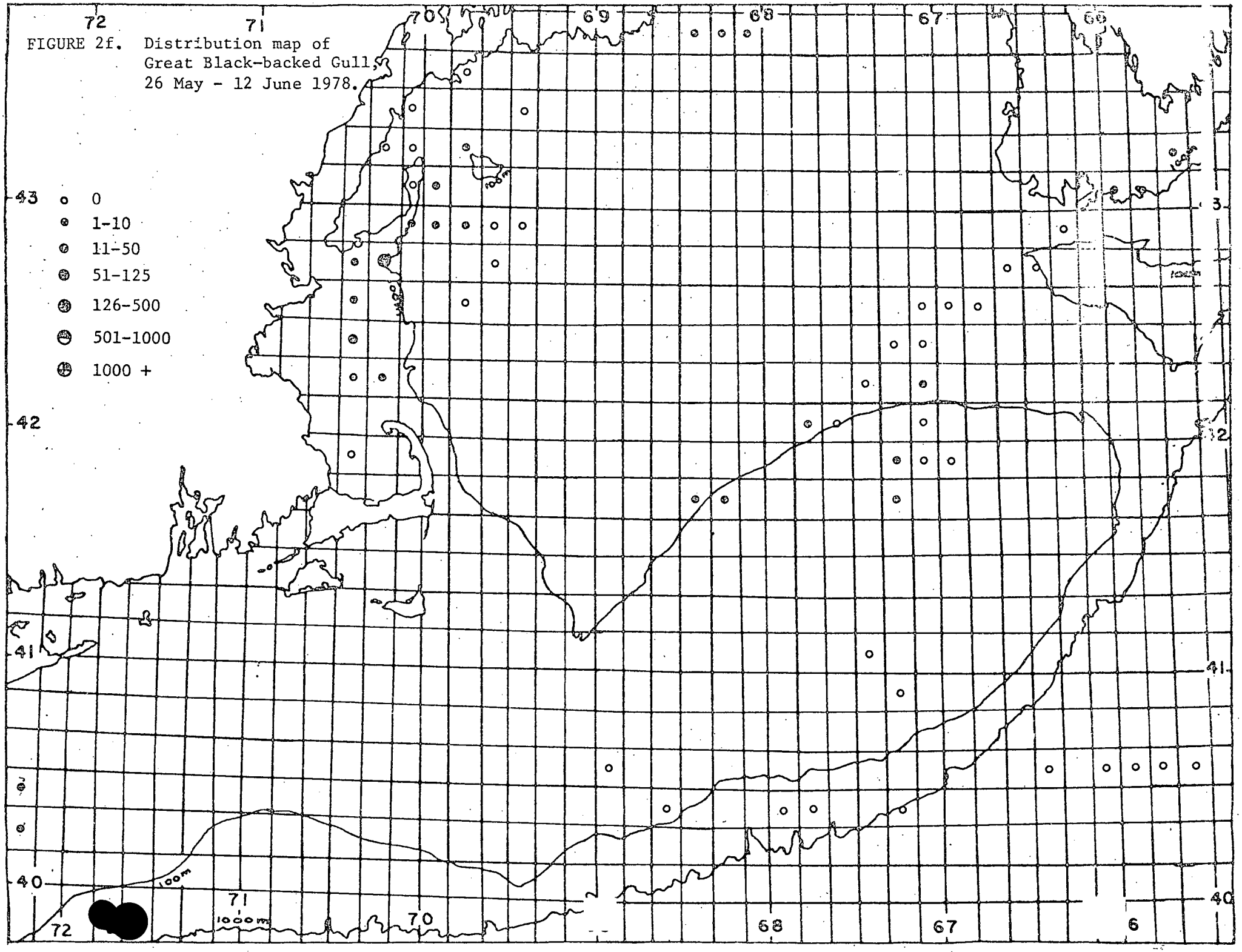

FIGURE 2f. Distribution map of Great Black-backed Gull, 26 May - 12 June 1978.

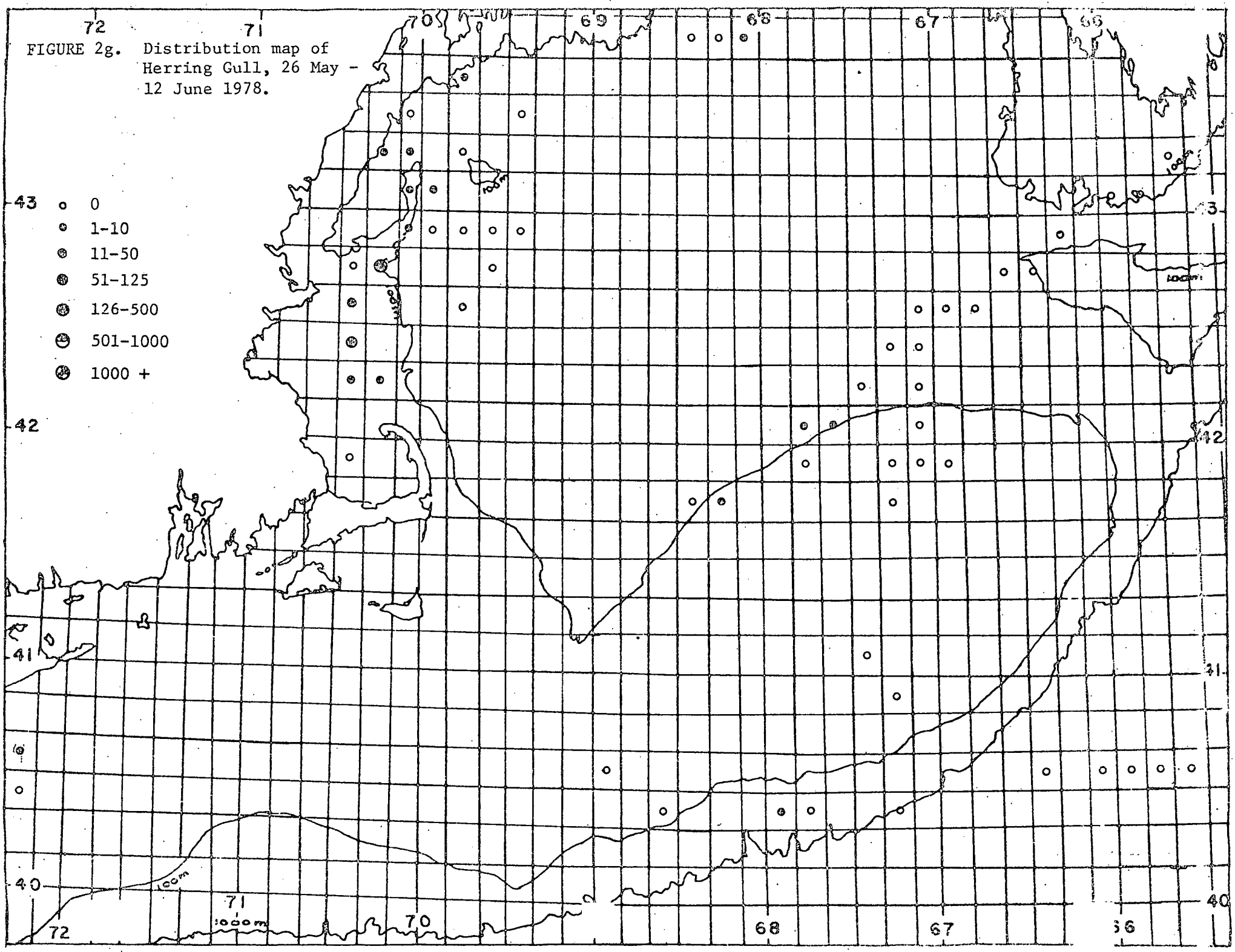

FIGURE 2g. Distribution map of Herring Gull, 26 May - 12 June 1978.

Cruise No. 7811

Cruise No. 7811

TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	1		2		3		4		5		6		7		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) May 1978	26		28		28		29		29		29		29		
Region*	G.M.		N.C.		N.C.		G.M.		G.M.		G.M.		G.M.		
Latitude(to nearest min.)	41-55		44-42		44-39		43-40		43-44		43-47		43-44		
Longitude(to nearest min.)	70-22		67-03		69-07		68-04		68-05		68-05		68-11		
Water depth(meters)	201		82		79		174		170		159		183		
Number of Birds	1		0		0		6		14		6		8		
Area Sampled(km^2)	0.65		1.11		1.11		0.46		0.46		0.46		0.37		
Birds per km^2.	1.54		0		0		13.04		30.43		13.04		21.62		
Species	Number Observed														
Sooty Shearwater									0	1					
Northern Fulmar							6	6	12	40	6	31	5	108	
Gannet	1	1									0	1			
G. Bl.-bk. Gull									2	2			0	6	
Herring Gull							0	1	0	1					
Arctic Tern													3	3	
Tern Spp.					0	3									

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TABLE 6. Summary of Transect or Station Census Data.

Ship: USCGC VIGILANT Observers: A.W. Nickerson

Transect ☑ Station ☐ No.	8		9		10		11		12		13		14	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) May 1978	29		30		30		30		30		30		30	
Region*	G.M.		G.M.		G.M.		G.M.		G.M.		G.M.		G.M.	
Latitude(to nearest min.)	43-46		42-43		42-38		42-18		42-24		42-36		42-38	
Longitude(to nearest min.)	68-28		69-35		69-41		70-11		70-22		70-26		70-23	
Water depth(meters)	201		274		247		40		31		128		82	
Number of Birds	6		3		0		0		7		2		29	
Area Sampled(km^2)	0.46		1.02		1.30		1.11		1.11		0.46		0.46	
Birds per km^2.	13.03		3.06		0		0		6.31		4.35		63.04	
Species	Number Observed													
Sooty Shearwater									5	5				
Northern Fulmar	0	2	3	3	0	2			0	1			1	1
Gannet											1	1		
Double-cr. Cormorant	5	5												
Great Bl.-bk. Gull	0	2							1	4	0	5	1	1
Herring Gull							0	2	1	7	1	2	27	16
Gull Spp.							0	7						
Arctic Tern														
Tern Spp.	1	1			0	1								

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TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	15		16		17		18		19		20		21	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) May + June 1978	30		31		31		31		31		31		1 5	
Region*	G.M.		G.B.		G.B.		G.B.		O.S.		O.S.		O.S.	
Latitude(to nearest min.)	42-40		41-03		40-58		40-53		40-31		40-31		40-22	
Longitude(to nearest min.)	70-21		67-24		67-17		67-10		66-03		65-53		65-29	
Water depth(meters)	101		64		80		84		2743		2743		3657	
Number of Birds	0		21		8		4		8		6		0	
Area Sampled(km²)	0.46		1.21		1.21		1.21		1.21		1.21		1.21	
Birds per km².	0		17.36		6.61		3.31		6.61		4.96		0	
Species	Number Observed													
Greater Shearwater			1	3	4	17	0	2	4	14	1	5	0	2
Sooty Shearwater					1	1					1	1		
Leach's Storm-Petrel													0	2
Wilson's Storm-Petrel			0	4	3	18	4	7	4	6	4	14		
Northern Fulmar	0	1	0	1										
Red Phalarope			20	20										
Great Bl.-bk. Gull	0	2												

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TABLE 6. Summary of Transect or Station Census Data.

USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	22		23		24		25		26		27		28		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) June 1978	1		1		1		1		1		1		1		
Region*	O.S.		O.S.		O.S.		O.S.		O.S.		G.B.		G.B.		
Latitude(to nearest min.)	40-32		40-32		40-31		40-30		40-27		40-27		40-27		
Longitude(to nearest min.)	65-38		65-47		65-56		66-23		67-12		67-42		67-51		
Water depth(meters)	3658		3475		3475		2377		786		137		137		
Number of Birds	1		1		1		5		33		36		4		
Area Sampled(km^2)	1.21		1.21		1.21		1.30		1.30		1.30		1.30		
Birds per km^2	0.83		0.83		0.83		3.85		25.39		27.69		5.38		
Species	Number Observed														
Greater Shearwater	0	5	1	3			4	15	11	36	10	42	4	11	
Sooty Shearwater	0	1							0	4	1	1	0	1	
Leach's Storm-Petrel			0	2			1	1							
Wilson's Storm-Petrel	1	11			1	1			1	15	25	99	0	2	
Northern Fulmar									2	4	0	5			
Red Phalarope									19	23					
Skua Spp.											0	1			
Herring Gull													0	1	

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TABLE 6. Summary of Transect or Station Census Data.

USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	29		30		31		32		33		34		35		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) June 1978	1		1		2		2		2		2		3		
Region*	G.B.		G.B.		S.N.E		S.N.E.		S.N.E.		S.N.E.		S.N.E.		
Latitude(to nearest min.)	40-29		40-31		40-29		40-33		40-29		40-29		40-20		
Longitude(to nearest min.)	68-31		68-50		72-10		72-17		72-22		72-30		73-03		
Water depth(meters)	137		73		73		37		18		18		37		
Number of Birds	12		6		0		2		3		2		0		
Area Sampled(km²)	1.02		1.30		1.30		0.93		1.30		1.30		1.30		
Birds per km².	11.77		4.62		0		2.15		2.31		1.54		0		
Species	Number Observed				No Birds								No Birds		
Greater Shearwater	5	18	1	10											
Sooty Shearwater			0	1											
Wilson's Storm-Petrel	7	34	5	22											
Northern Fulmar	0	1													
Great Black-bk. Gull							0	1	3	3					
Herring Gull							2	4			2	2			
Common Tern															

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TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	36		37		38		39		40		41		42	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	T. F.	F.A.	Tot.
Date(GMT) June 1978	3		4		4		4		4		4		4	
Region*	S.N.E.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	40-19		41-45		41-51		41-55		41-58		41-58		42-07	
Longitude(to nearest min.)	72-25		67-15		67-12		67-08		66-58		67-01		67-06	
Water depth(meters)	55		46		55		55		62		73		82	
Number of Birds	14		62		2200		550		91		133		374	
Area Sampled(km^2)	1.30		1.21		1.21		1.21		1.21		1.21		1.21	
Birds per km^2.	10.77		51.24		1818.2		454.6		75.21		109.9		309.1	
Species	Number Observed													
Greater Shearwater	3	18	20	20	1500	1976	375	750	50	152	75	235	200	435
Sooty Shearwater	6	15	25	25	500	661	125	250	35	116	35	95	100	240
Wilson's Storm-Petrel	5	11	5	15	200	268	50	100	1	1	0	1		
Northern Fulmar			2	2					5	25	23	128	73	169
Pomarine Jaeger	0	1											1	1
Great Bl.-bk. Gull					0	1								

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TABLE 6. Summary of Transect or Station Census Data.

USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	43		44		45		46		47		48		49	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) June 1978	5		5		5		5		5		5		5	
Region*	G.B.		G.B.		G.B.		G.B.		G.B.		G.B.		G.B.	
Latitude(to nearest min.)	42-15		41-47		41-43		42-05		41-49		41-42		41-40	
Longitude(to nearest min.)	67-09		67-13		67-18		67-35		68-11		68-15		68-24	
Water depth(meters)	73		46		55		73		73		60		73	
Number of Birds	126		210		16		4		44		0		37	
Area Sampled(km^2)	1.21		0.93		0.93		1.30		1.30		1.30		1.30	
Birds per km^2.	104.1		225.8		17.20		3.08		33.85		0		28.46	
Species	Number Observed													
Greater Shearwater	65	1067	150	1650	10	67	2	1017	25	135	0	850	25	195
Sooty Shearwater	35	542	30	380	4	18	1	103	9	26	0	87	7	29
Wilson's Storm Petrel			0	55			0	1						
Northern Fulmar	25	280	30	284	2	10	1	106	10	47	0	5	5	32
Great Bl.-bk. Gull	1	1	0	2					0	1	0	4		
Manx Shearwater			0	1										
Leach's Storm-Petrel							0	1						
Herring Gull							0	2			0	3		

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TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	50		51		52		53		54		55		56		
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	
Date(GMT) June 1978	6		6		6		6		6		6		6		
Region*	G.B.		G.B.		G.B.		G.M.		G.M.		G.M.		G.M.		
Latitude(to nearest min.)	42-03		42-03		42-08		42-16		42-21		42-25		42-30		
Longitude(to nearest min.)	67-42		67-46		67-39		67-23		67-16		67-08		67-00		
Water depth(meters)	157		183		183		274		302		366		338		
Number of Birds	45		19		9		9		9		7		7		
Area Sampled(km^2)	1.30		1.30		1.30		1.30		1.30		1.30		1.30		
Birds per km^2	34.62		14.62		6.92		6.92		6.92		5.39		5.39		
Species	Number Observed														
Greater Shearwater	25	130	12	42	5	18	4	16	0	5	3	7	2	5	
Sooty Shearwater	8	28	2	2	0	3	0	2			0	1			
Northern Fulmar	12	47	5	18	3	11	5	28	7	37	4	12	5	14	
Common Puffin					1	1									
Great Black-bk. Gull	0	8													
Herring Gull	0	5													

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TABLE 6. Summary of Transect or Station Census Data.

Vessel USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	57		58		59		60		61		62		63	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) June 1978	6		6		6		6		6		6		6	
Region*	G.M.		G.M.		W.NS		W.NS		W.NS		W.NS		W.NS	
Latitude(to nearest min.)	42-35		42-38		42-42		42-46		42-50		43-03		43-07	
Longitude(to nearest min.)	66-50		66-43		66-35		66-27		66-18		65-53		65-45	
Water depth(meters)	183		201		174		99		64		86		55	
Number of Birds	32		93		19		18		8		6		11	
Area Sampled(km^2)	1.30		1.30		1.30		1.30		1.30		1.30		1.30	
Birds per km^2.	24.62		71.54		13.85		13.85		6.15		4.62		8.46	
Species	Number Observed													
Greater Shearwater	10	27	4	15	7	19	3	3	7	17	5	30	5	15
Sooty Shearwater	6	17	0	2	1	1					1	1	1	1
Northern Fulmar	11	31	4	17										
R. Phalarope	3	5	10	10	0	5	9	9			0	35		
Leach's Storm-Petrel	2	12	75	75	6	16	5	5					5	5
Wilson's Storm-Petrel					4	5								
Gannet					1	1			1	1			0	2
Tern Spp.							1	1						
Great Bl.-bk. Gull											0	1		

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TABLE 6. Summary of Transect or Station Census Data.

USCGC VIGILANT Observers A. W. Nickerson

Transect ☑ Station ☐ No.	64		65		66		67		68		69		70	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) June 1978	6		6		9		9		9		9		9	
Region*	N.C.		N.C.		G.M.		G.M.		G.M.		G.M.		G.M.	
Latitude(to nearest min.)	43-12		43-16		42-50		42-52		42-54		42-56		42-58	
Longitude(to nearest min.)	65-39		65-30		69-23		69-32		69-40		69-50		69-59	
Water depth(meters)	55		38		120		156		165		232		141	
Number of Birds	33		1		5		208		0		5		17	
Area Sampled(km^2)	1.21		1.21		1.21		1.21		1.21		1.21		1.21	
Birds per km^2	27.27		0.83		4.13		171.9		0		4.13		14.05	
Species	Number Observed													
Greater Shearwater	15	43	0	12	0	5	1	2	0	1			0	4
Sooty Shearwater	2	8			0	1	0	1			5	10		
Wilson's Storm-Petrel					3	3	205	205					15	40
L. h's Storm-Petrel					1	1								
Northern Fulmar	7	19	1	1	1	6	1	2	0	1	0	12	1	6
Gannet			0	1										
Manx Shearwater											0	1		
Tern Spp.	8	8												
Great Bl.-bk. Gull	1	1							0	2			1	1

Cruise No. 7811

TABLE 6. Summary of Transect or Station Census Data.

Ship USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	71		72		73		74		75		76		77	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) June 1978	10		10		10		10		10		10		10	
Region*	G.M.		G.M.		G.M.		G.M.		G.M.		G.M.		G.M.	
Latitude(to nearest min.)	43-09		43-12		43-18		43-23		43-34		43-28		43-18	
Longitude(to nearest min.)	70-09		70-10		70-04		70-00		69-49		69-28		69-40	
Water depth(meters)	119		110		146		141		77		139		161	
Number of Birds	0		1		0		0		0		4		4	
Area Sampled(km²)	1.21		1.21		1.21		1.21		1.21		1.21		1.21	
Birds per km².	0		0.83		0		0		0		3.31		3.31	
Species	NO BIRDS Number Observed													
Greater Shearwater			0	1										
Northern Fulmar			0	2	0	1					4	6	3	5
Wilson's Storm-Petrel													1	1
G + Bl.-bk. Gull	0	1			0	1			0	1				
Herring Gull	0	1	1	1	0	1			0	1				

Cruise No. 7811

TABLE 6. Summary of Transect or Station Census Data.

S USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	78		79		80		81		82		83		84	
	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.	F.A.	Tot.
Date(GMT) June 1978	10		10		10		10		11		11		11	
Region*	G.M		G.M.		G.M		G.M.		G.M.		G.M.		G.M.	
Latitude(to nearest min.)	43-08		43-01		42-50		42-45		42-13		42-17		42-21	
Longitude(to nearest min.)	69-52		69-54		70-09		70-15		70-23		70-17		70-22	
Water depth(meters)	177		35		55		91		72		26		82	
Number of Birds	0		3		450		8		0		0		93	
Area Sampled(km^2)	1.21		1.21		1.30		0.46		1.21		1.21		1.11	
Birds per km^2	0		2.48		346.2		17.39		0		0		83.78	
Species	Number Observed													
Northern Fulmar	0	6	2	8			4	158						
Sooty Shearwater							0	20					7	18
Wilson's Storm-Petrel					450	1200	2	12					2	2
G net							0	1						
Pomarine Jaeger													0	1
Great Bl.-bk. Gull			0	1	0	5	0	300			0	1	22	32
Herring Gull	0	1	1	2	0	2	2	407	0	4	0	2	60	79
Greater Shearwater													2	3

Cruise No. 7811

TABLE 6. Summary of Transect or Station Census Data.

USCGC VIGILANT Observers A.W. Nickerson

Transect ☑ Station ☐ No.	85		86												
	F.A.	Tot.	F.A.	Tot.											
Date(GMT)	11		11												
Region*	G.M		G.M.												
Latitude(to nearest min.)	43-17		42-12												
Longitude(to nearest min.)	70-15		70-15												
Water depth(meters)	33		29												
Number of Birds	0		1												
Area Sampled(km^2)	1.11		0.46												
Birds per km^2	0		2.17												
Species	Number Observed														
Herring Gull	0	2	1	6											
Black-legged Kittiwake	0	7													

MANOMET BIRD OBSERVATORY SEABIRD STUDIES

Cruise Report, 6 - 20 June 1978

Cruise No. 7812

INTRODUCTION

The following report summarizes bird and mammal observations made by Richard R. Veit, Volunteer Observer, on waters from Cape Hatteras to southern Gulf of Maine aboard USCGC VIGOROUS, 6 - 20 June 1978. The mission of the patrol was offshore law enforcement, search and rescue. The observer was aboard on a non-interference basis primarily to collect information on distribution, abundance, behavior and oiling of marine birds.

Manomet Bird Observatory gratefully acknowledges the cooperation of the U. S. Coast Guard for allowing an observer to join the patrol. The observer thanks CMR W. T. Leland, the officers and crew of USCGC VIGOROUS for their generous assistance and cooperation aboard ship. Financial support of MBO seabird studies is provided by U.S. Department of Energy (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

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 coastal and marine bird species, and marine mammals. Figure 1 graphically illustrates the cruise track during daylight hours and Figure 2a-h indicates the distribution of eight bird species using the greatest total bird count of each species per 10-minute square latitude/longitude block surveyed.

This patrol was advantageous in that a very wide geographic area was covered, from the northern edge of Georges Bank south and west to the continental slope waters off of Cape May, New Jersey. As has been found on previous cruises, the distribution of marine birds is greatly influenced by major fishing operations. This year, no major fisheries were operating along the continental slope of the southern edge of Georges Bank as was the case last year; however, at least 30 American and Canadian vessels were fishing cod and haddock along the northern edge of Georges Bank, from Cultivator Shoals east

to the Northeast Peak. It was around these vessels that the majority of marine birds (virtually entirely *Procellarids*) was noted. Some 8,000 Northern Fulmars, 50,000+ Greater Shearwaters and 15,000± Sooty Shearwaters comprised the bulk of the birds feeding in that region. Wilson's Storm-Petrels were altogether scarce and never noted in any sizeable concentrations. The comparative abundance of Northern Fulmars in that region is intriguing. Either the colder water temperatures of that area (as compared to that of the southern edge, where only 300 fulmars were noted in June, 1978) are a major factor in influencing fulmar's abundance, or they are actually more abundant this year, is uncertain. I suspect a combination of those two factors.

In striking contrast to the productive waters of Georges Bank, there were few, if any marine birds associated with a fleet of 8-10 Spanish and Mexican stern trawlers fishing for squid on the continental slope off Cape May, New Jersey. Cory's Shearwaters were common from this region north to the extreme southern edge of Georges Bank.

The ship went south into the deep waters south and east of the continental slope (95-140 mi. south of Nantucket) and Leach's Storm Petrels were notably more common there than on the shallower waters of the fishing banks. A similar correlation has been somewhat apparent in the Gulf of Maine, where sightings of this species appear to be more frequent in waters deeper than 100 fathoms.

A small fleet of six Spanish stern trawlers had attracted 600-650 Greater Shearwaters per ship after 3 days of fishing in the vicinity of Veatch Canyon. That Spanish fleet subsequently left the area because of poor fishing. Among these Greaters was one bizarre leucistic bird, lacking in all bodily pigment save for that in the remiges and rectrices.

Five sightings of positively identified South Polar Skuas and three sightings of unidentified skuas, involving at least 5 separate birds, supported

observations made in 1977 (See MBO Cruise No. 7713, R. R. Veit). All of these Skuas were seen northeast of Hudson Canyon. One adult Long-tailed Jaeger, without central tail rectrices, was noted on the southeast part of Georges Bank on June 7. The only other positively identified jaegers observed were Pomarines. At least two of the Pomarine Jaegers seen were full adults, and all jaegers (including unidentified) seen were in the light phase.

Three sightings of single adult Common Puffins, in winter plumage, were recorded on Georges Bank (southern portion).

TABLE 1.

Seabird Density in Selected Regions Using Fixed Area Transects

6 - 20 June 1978

Region	Number of Transects	Total Km^2 Surveyed (Tkm^2)	Total Birds (TB)	Mean Density (TB/Tkm^2)	Density Range (TB/Km^2/Transect)
Gulf of Maine	22	16.5	167	10.1	0 - 42.0
Georges Bank	27	24.4	1113	45.6	0 - 647.5
Southern New England	35	32.7	697	21.3	0 - 484.4
Mid-Atlantic	21	21.5	53	2.5	0 - 11.7
South Coastal	2	2.2	12	5.5	4.5 - 6.4
Off Continental Shelf	11	16.1	28	2.7	0 - 12.5

TABLE 2.

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

6 - 20 June 1978

Species	GM	GB	SNE	MA	OCS	SC
Common Loon						1
Northern Fulmar	30	99	1			
Cory's Shearwater			4	11	3	
Greater Shearwater	62	613	243	8	4	
Sooty Shearwater	15	325	318	1	1	
Leach's Storm-Petrel	1	2	1		11	
Wilson's Storm-Petrel	50	50	111	33	8	
Unid. storm-petrel					1	
Gannet			1			
Pomarine Jaeger			1			
Unid. jaeger			1			
South Polar Skua		1	1			1
Great Black-backed Gull	4	6	1			4
Herring Gull	5		12			
Unid. large gull			1			
Common Tern						6
Arctic Tern		17				
Common Puffin			1			

TABLE 3.

List of Rare or Infrequent Marine Bird Sightings

6 - 20 June 1978

Species	Number	Date	Location	Remarks
Common Tern	5	6-6	41°09'N,71°48'W	
Common Tern	28	6-6	41°05'N,71°45'W	
Common Loon	1	6-6	41°05'N,71°45'W	Sitting
Pomarine Jaeger	1	6-6	40°55'N,71°19'W	Adult, light phase
Pomarine Jaeger	1	6-6	40°48'N,70°48'W	Adult, light phase
Gannet	1	6-6	40°41'N,70°25'W	Juvenal
Unid. tern	2	6-7	40°46'N,67°13'W	Sitting on flotsam
Common Puffin	1	6-7	40°49'N,67°03'W	Sitting
Long-tailed Jaeger	1	6-7	40°49'N,67°03'W	Adult without tail streamers
Black-legged Kittiwake	2	6-7	40°47'N,66°48'W	Adults
Unid. small alcid	1	6-7	40°46'N,67°13'W	Traveling
Common Puffin	1	6-7	40°55'N,66°50'W	Adult, winter plumage
Unid. skua (SPSK?)	1	6-7	41°16'N,66°50'W	Flushed off water by ship
Unid. jaeger (POJA?)	1	6-7	41°24'N,66°50'W	Sitting, flushed
South Polar Skua	1	6-7	41°28'N,66°48'W	Photographed
Unid. skua	1	6-7	41°47'N,67°00'W	
Arctic Tern	4	6-7	41°47'N,67°00'W	First year birds
Manx Shearwater	1	6-7	41°55'N,67°09'W	Near fishing fleet
Arctic Tern	12	6-7	41°59'N,67°12'W	
Gannet	3	6-10	41°46'N,69°28'W	2 - 2W, 1- ad.
Gannet	1	6-10	41°51'N,69°03'W	
Gannet	1	6-10	41°54'N,68°49'W	2W

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TABLE 3. (continued)

Species	Number	Date	Location	Remarks
Unid. tern	1	6-10	42°00'N,68°14'W	
Manx Shearwater	1	6-10	42°05'N,67°50'W	
Black-legged Kittiwake	1	6-10	42°05'N,67°50'W	
Pomarine Jaeger	1	6-10	42°02'N,66°59'W	3W, light phase
Arctic Tern	13	6-10	42°02'N,66°59'W	Sitting, flushed
Arctic tern	2	6-10	41°58'N,67°00'W	
Unid. tern	2	6-12	40°31'N,68°48'W	Sitting on flotsam
South Polar Skua	1	6-12	40°31'N,68°48'W	
Common Puffin	1	6-12	40°23'N,69°11'W	Sitting
Pomarine Jaeger	1	6-13	40°03'N,70°01'W	Adult, light phase
South Polar Skua	1	6-13	40°03'N,70°01'W	
South Polar Skua	1	6-13	40°02'N,69°59'W	Sitting, flushed
Audubon's Shearwater	1	6-13	38°34'N,70°23'W	
Unid. jaeger	1	6-14	40°01'N,69°51'W	Possible LTJA
Gannet	1	6-14	39°57'N,69°42'W	
Laughing Gull	1	6-14	39°57'N,69°42'W	Adult
Unid. skua	1	6-15	39°45'N,72°00°W	Possible SPSK
Unid. tern	4	6-17	39°04'N,73°06'W	Probably COTE
Unid. jaeger	2	6-17	39°04'N,73°06'W	
Laughing Gull	2	6-18	39°31'N,73°54'W	Adults
South Polar Skua	1	6-8	42°14'N,67°07'W	

TABLE 4.

List of Marine Mammal Sightings

6 - 20 June 1978

Species	Number	Date	Location	Remarks
Unid. dolphin	12	6-6	40°57'N,71°26'W	Porpoising
Humpback	ca. 10	6-6	40°55'N,71°19'W	Feeding, bird assoc.
Finback	ca. 40	6-6	40°55'N,71°19'W	Feeding, bird assoc.
Common Dolphin	ca. 250	6-6	40°55'N,71°19'W	Feeding, bird assoc.
Unid. dolphin	3	6-6	40°44'N,70°34'W	Porpoising
Ocean sunfish	1	6-7	40°47'N,66°48'W	
Finback	1	6-7	41°09'N,66°50'W	Avoided ship
Humpback	1	6-7	41°09'N,66°50'W	Tail lobing
Pilot Whale	20	6-7	41°47'N,67°00'W	Feeding, bird assoc.
Common Dolphin	4	6-10	41°48'N,69°18'W	Attracted to ship
Pilot Whale	10	6-10	41°48'N,69°18'W	Porpoising
Unid. rorqual	1	6-10	41°54'N,68°42'W	Sounded
Unid. rorqual	1	6-10	42°00'N,68°14'W	Sounded
Right Whale	1	6-10	42°01'N,68°06'W	V-spout, no dorsal fin, sounded showing flukes
Right Whale	1	6-10	42°05'N,67°50'W	V-spout, no dorsal fin, sounded showing flukes
Pilot Whale	8	6-11	41°48'N,66°58'W	Bird assoc.
Pilot Whale	12,10	6-12	40°31'N,68°48'W	Porpoising, bird assoc.
Unid. dolphin	4	6-12	40°25'N,69°06'W	Porpoising
Unid. dolphin	4	6-12	40°23'N,69°11'W	Porpoising
Unid. dolphin	2	6-13	49°57'N,70°05'W	Beaked, all gray body, porpoising
Humpback	1	6-15	38°57'N,72°57'W	Breached, white flippers

TABLE 5.

List of Non-Marine Bird Sightings

Species	Number	Date	Location	Remarks
Epidonax Sp.	1	6-10	42°01'N,68°06'W	ACFL (?)
Brown-headed Cowbird	1	6-10	41°53'N,69°02'W	

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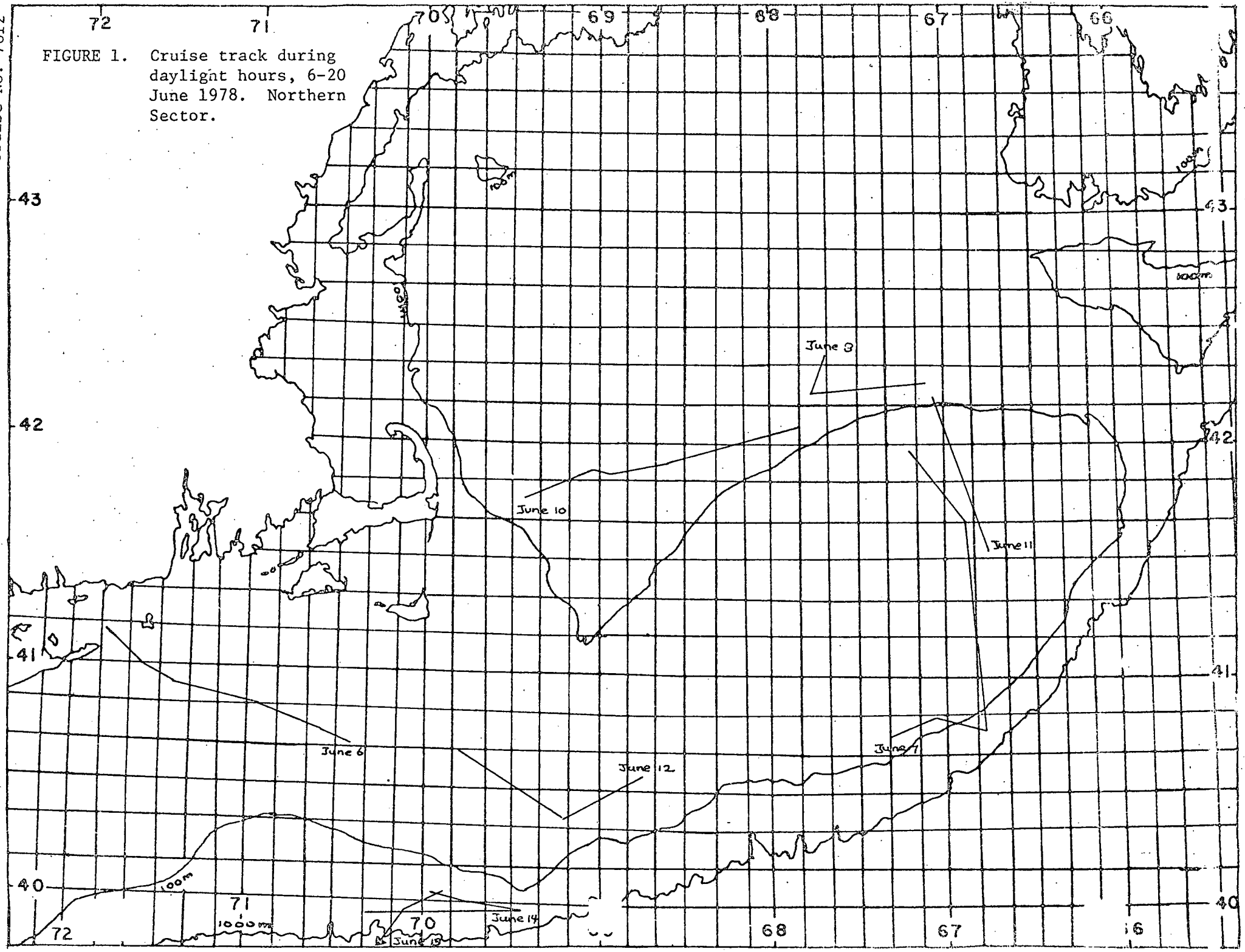


FIGURE 1. Cruise track during daylight hours, 6-20 June 1978. Northern Sector.

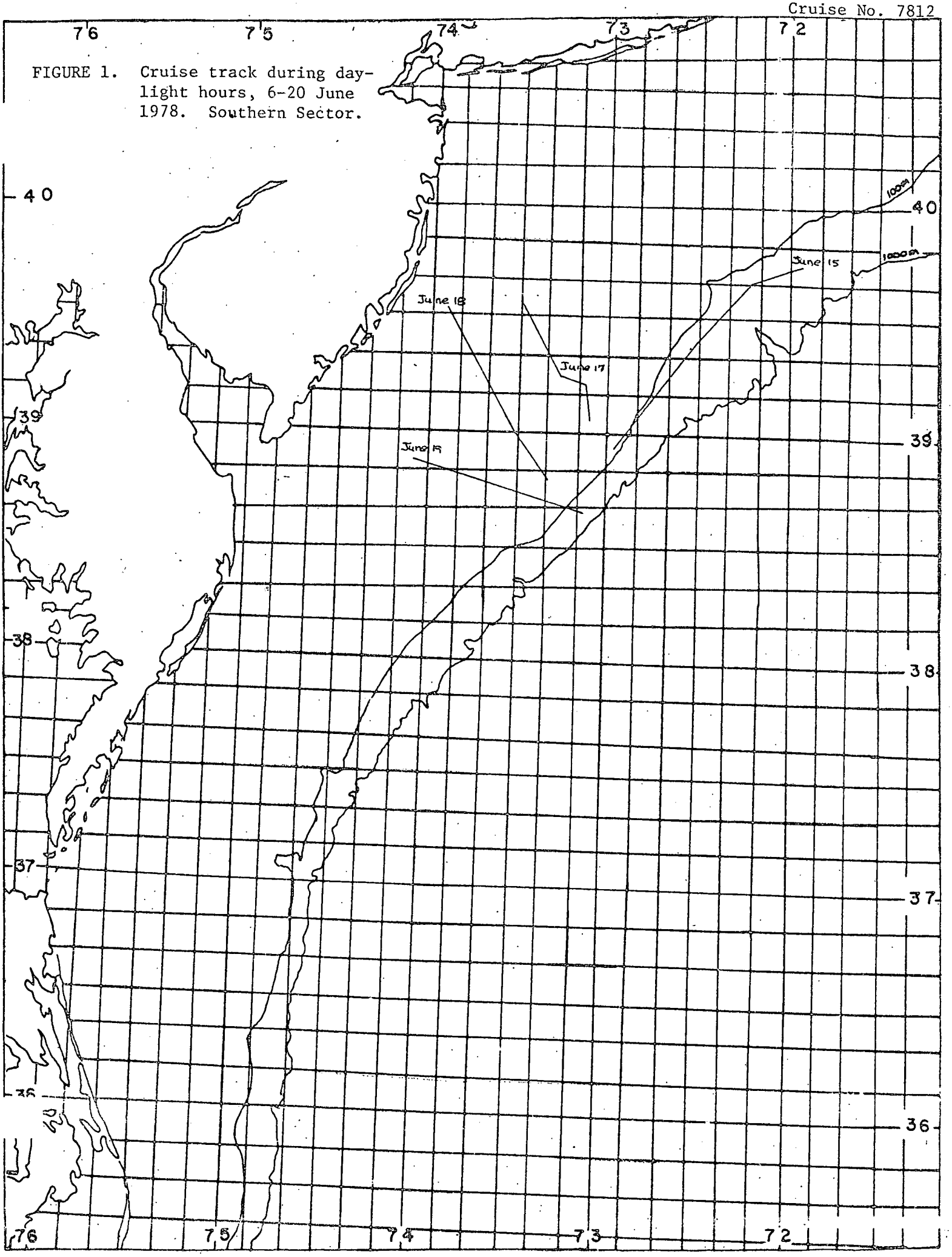
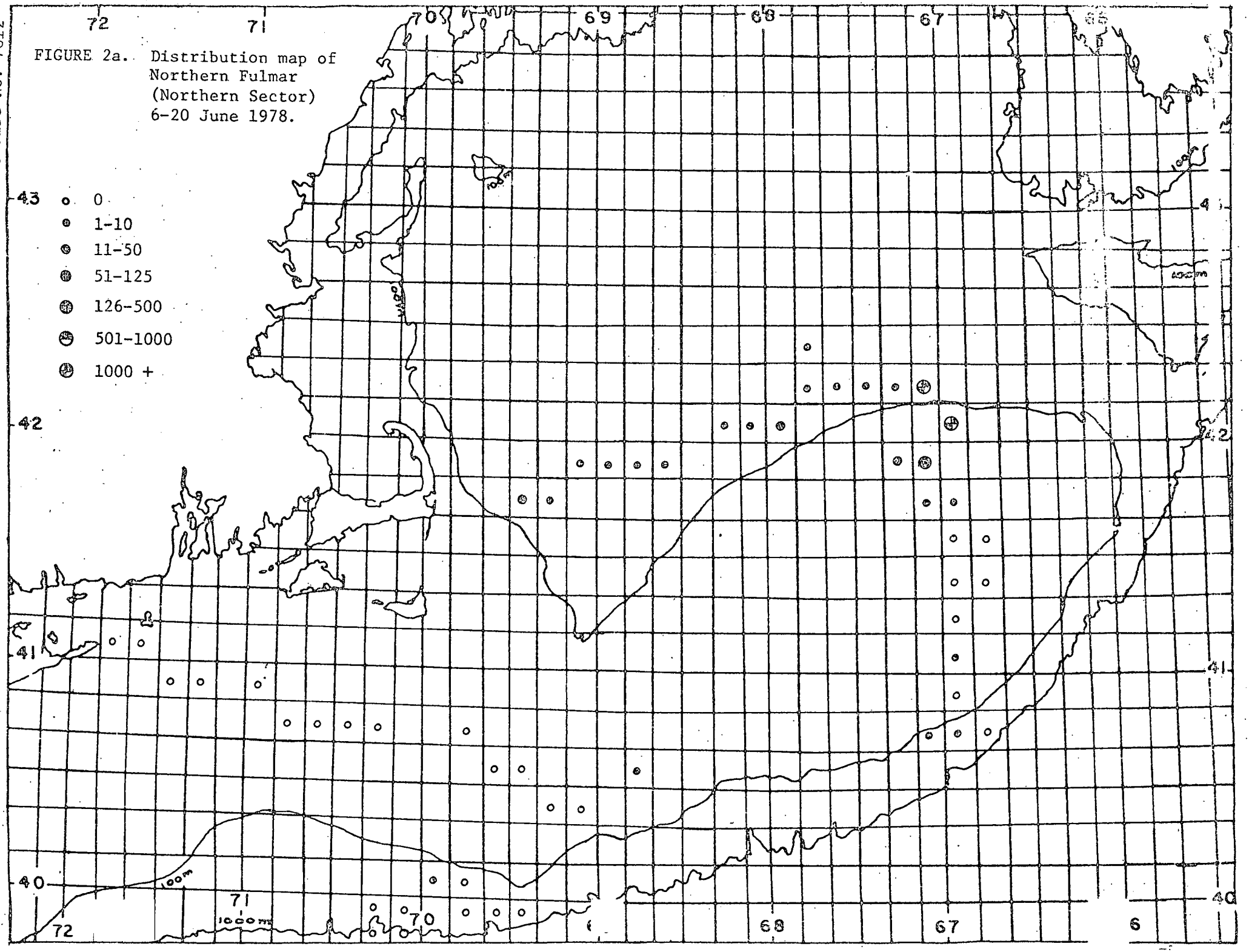


FIGURE 1. Cruise track during daylight hours, 6-20 June 1978. Southern Sector.

Cruise No. 7812

FIGURE 2a. Distribution map of Northern Fulmar (Northern Sector) 6-20 June 1978.



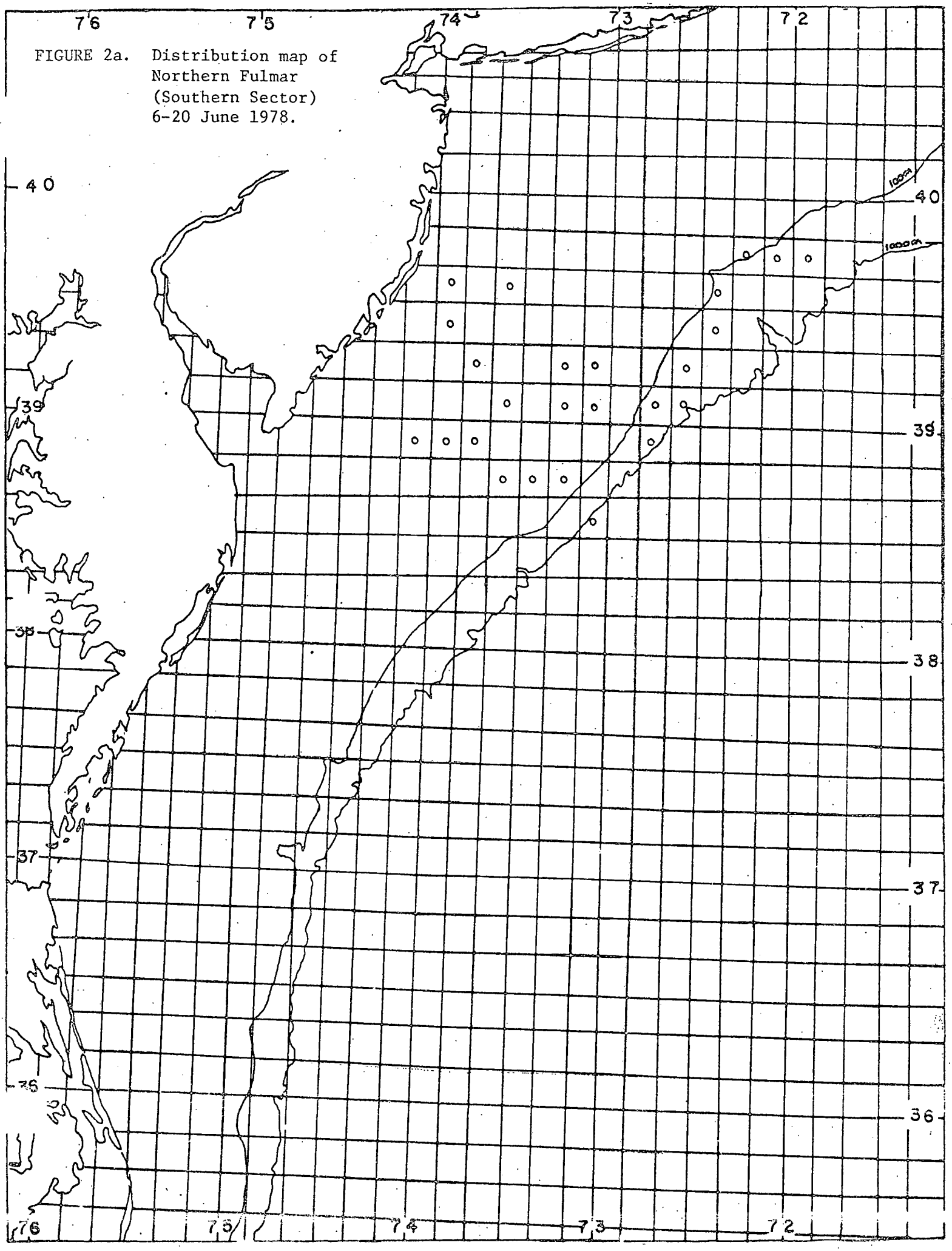


FIGURE 2a. Distribution map of Northern Fulmar (Southern Sector) 6-20 June 1978.

Cruise No. 7812

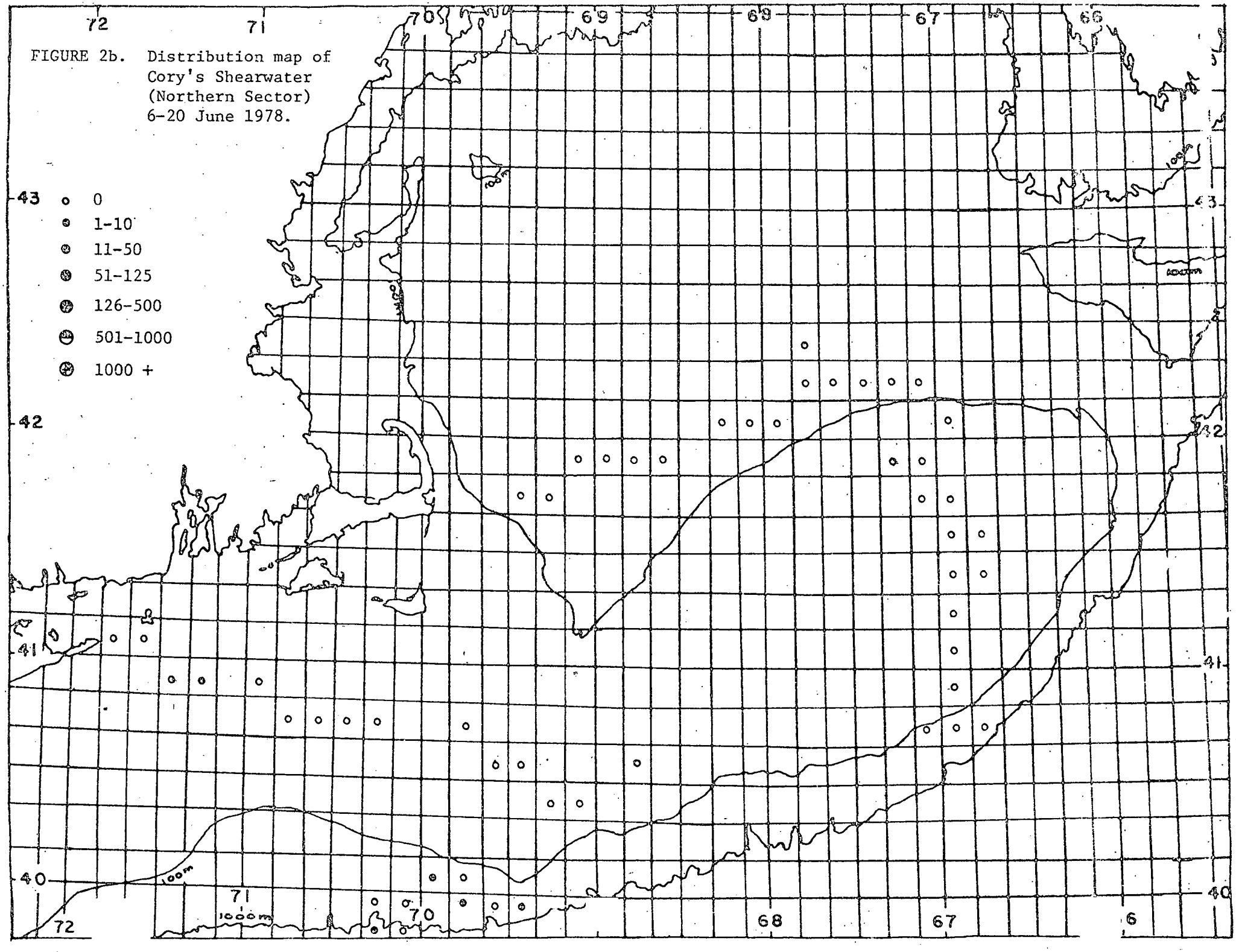


FIGURE 2b. Distribution map of Cory's Shearwater (Northern Sector) 6-20 June 1978.

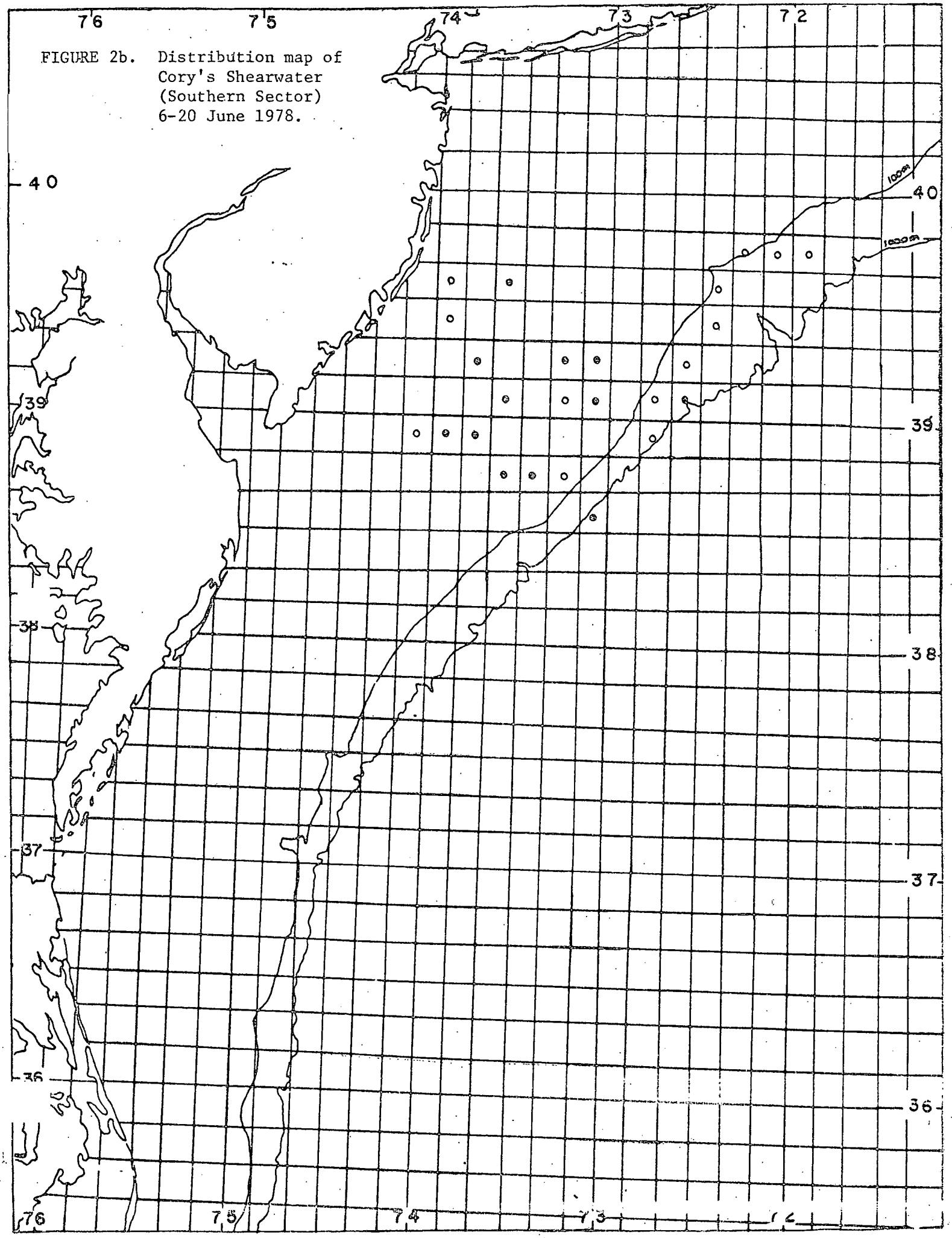


FIGURE 2b. Distribution map of Cory's Shearwater (Southern Sector) 6-20 June 1978.

Cruise No. 7812

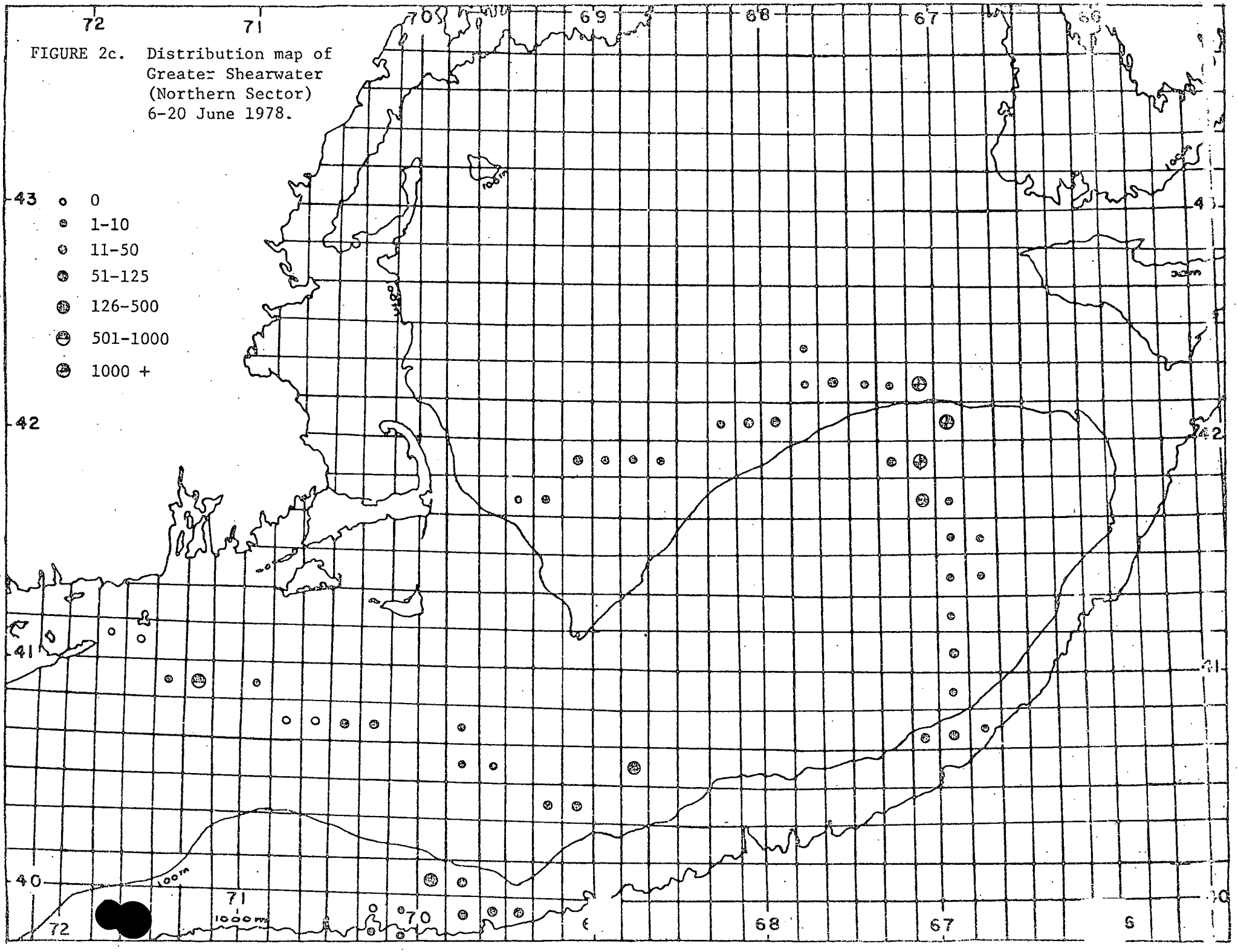


FIGURE 2c. Distribution map of Greater Shearwater (Northern Sector) 6-20 June 1978.

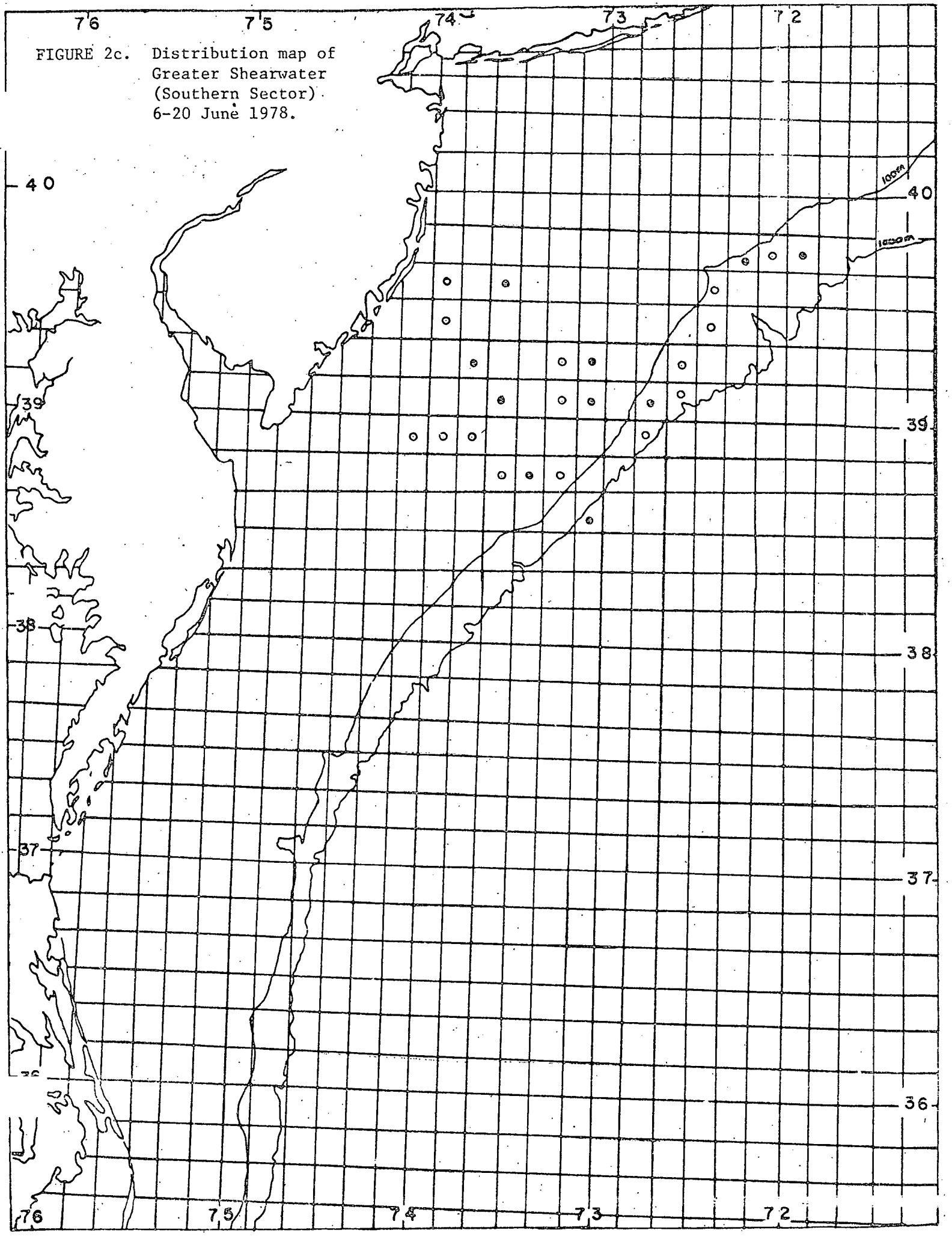


FIGURE 2c. Distribution map of Greater Shearwater (Southern Sector) 6-20 June 1978.

Cruise No. 7812

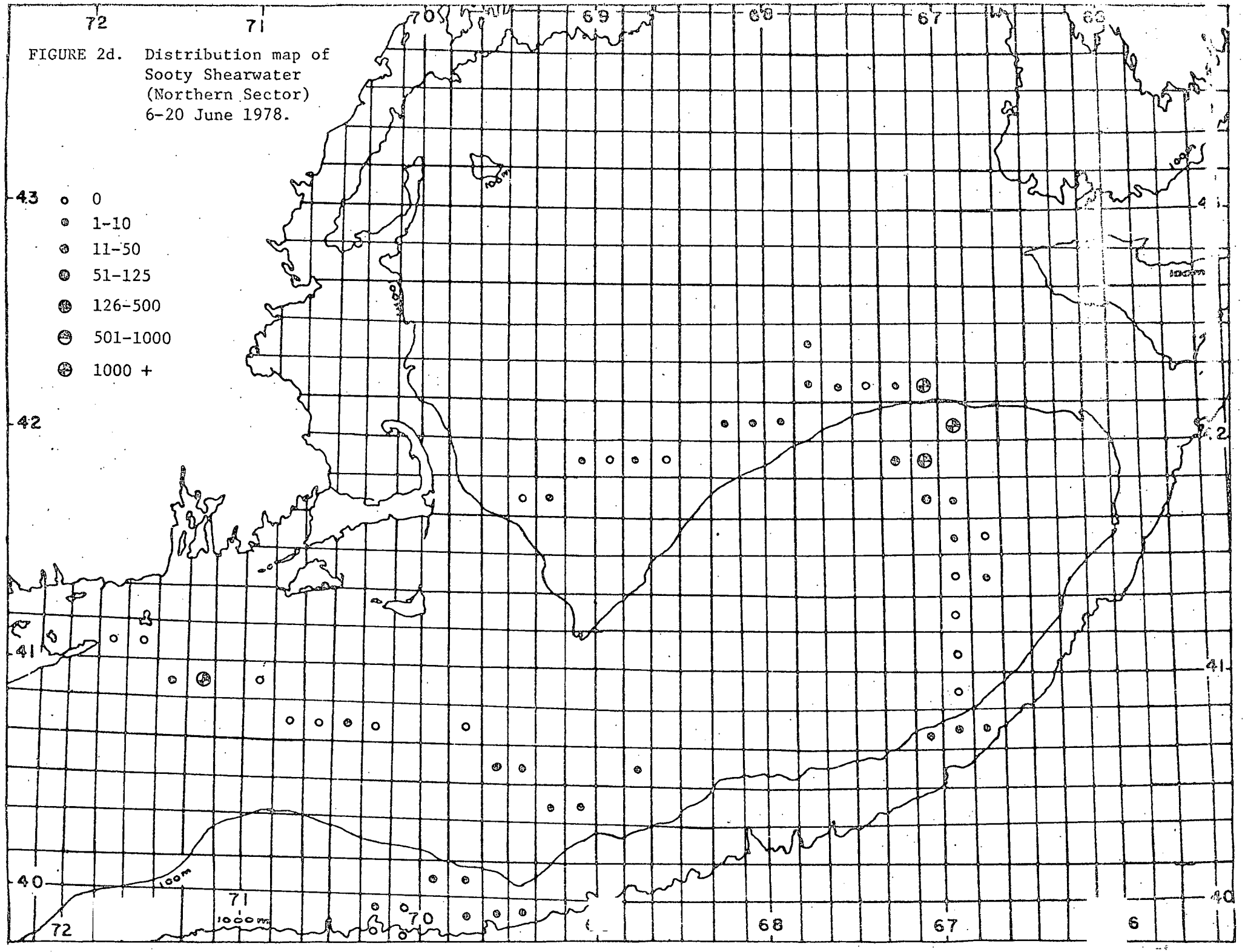
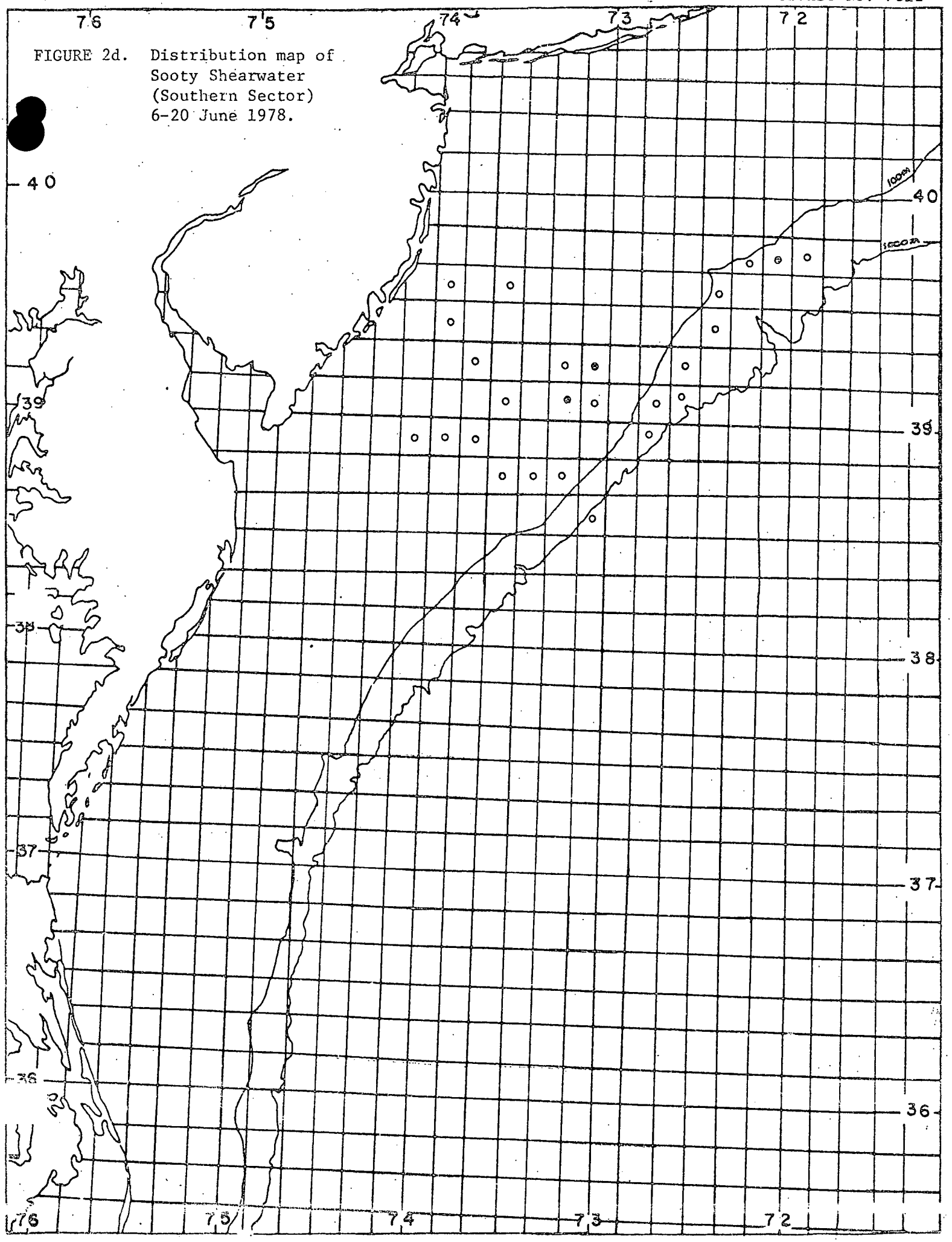


FIGURE 2d. Distribution map of Sooty Shearwater (Northern Sector) 6-20 June 1978.

Cruise No. 7812

FIGURE 2d. Distribution map of Sooty Shearwater (Southern Sector) 6-20 June 1978.



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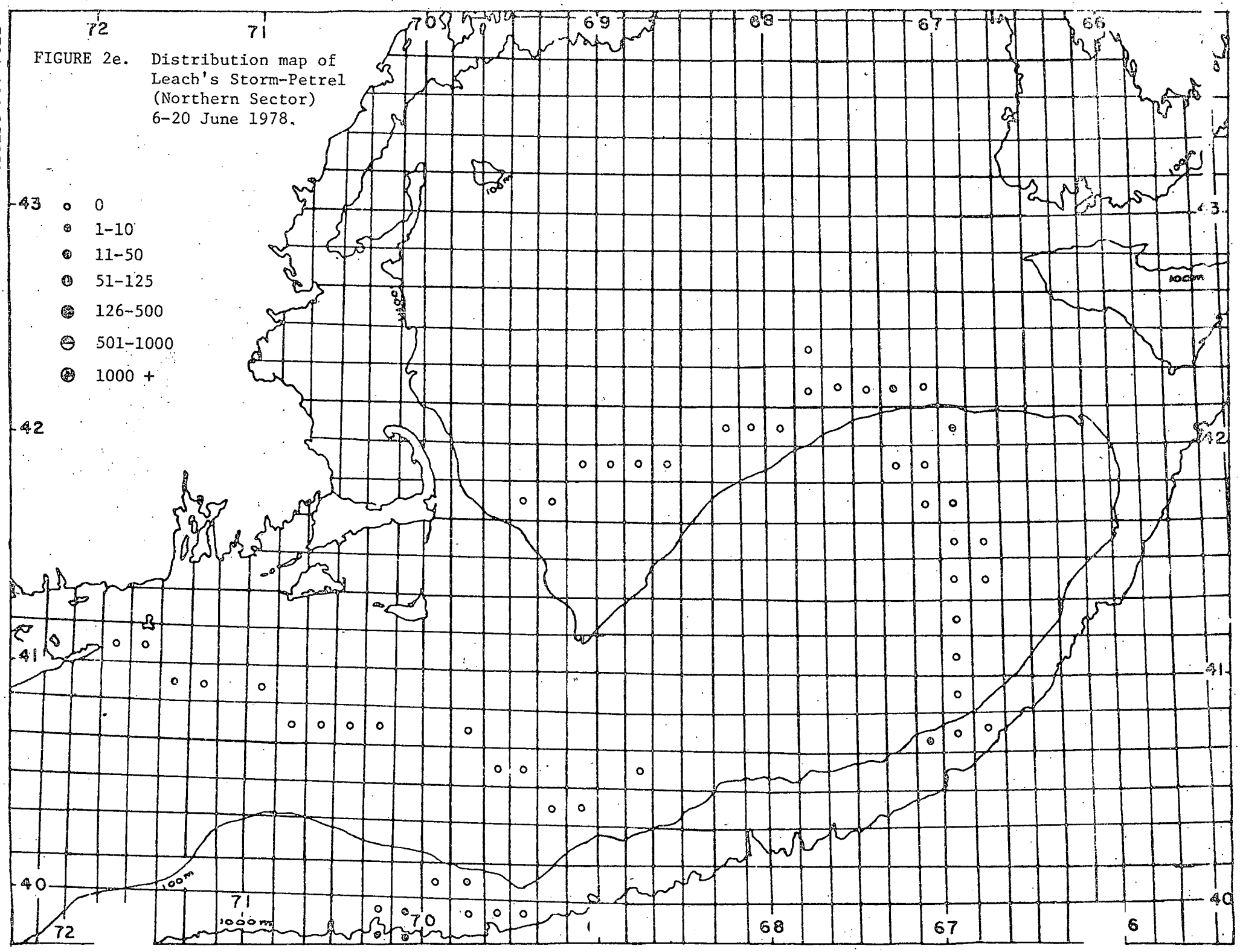

FIGURE 2e. Distribution map of Leach's Storm-Petrel (Northern Sector) 6-20 June 1978.

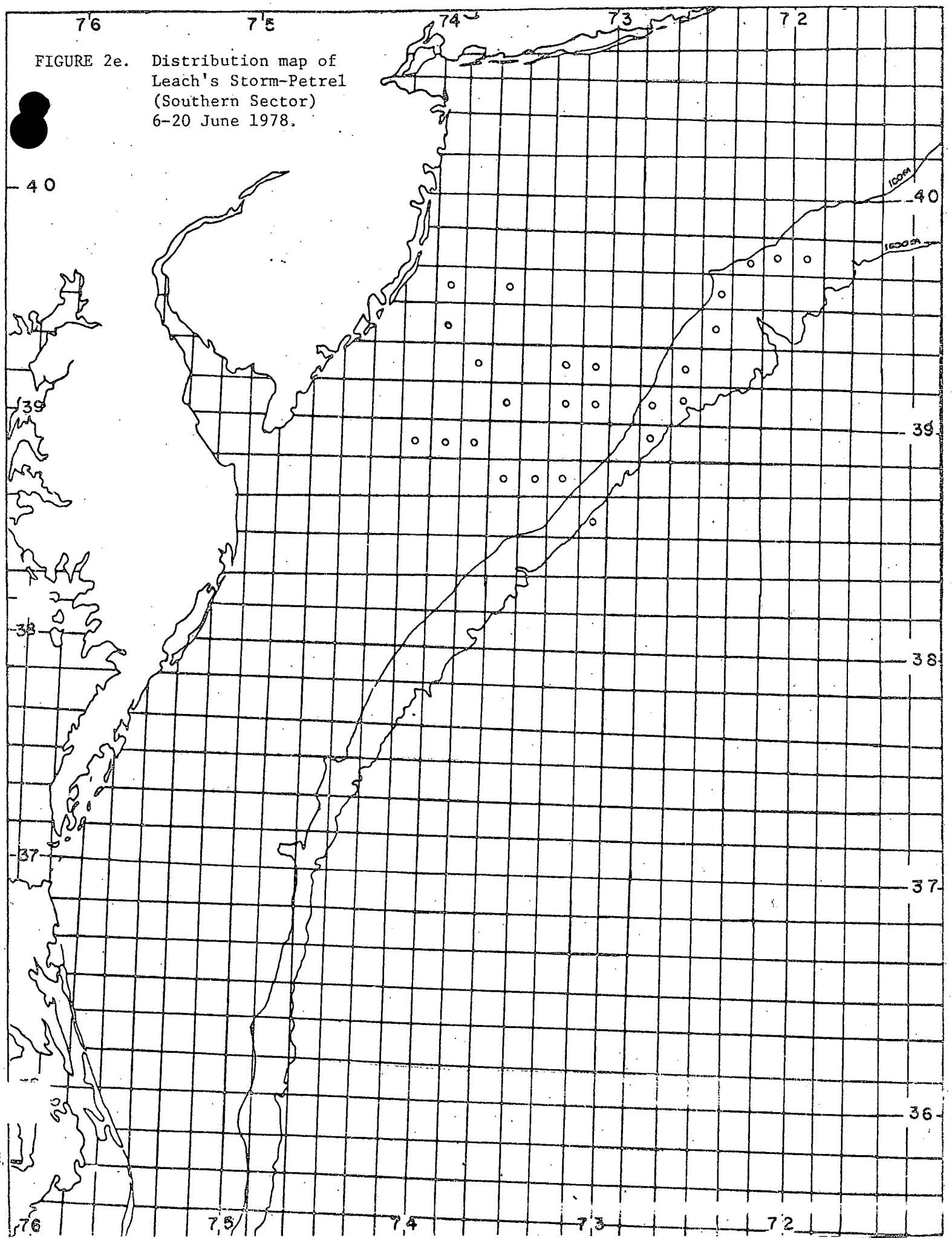

FIGURE 2e. Distribution map of Leach's Storm-Petrel (Southern Sector) 6-20 June 1978.

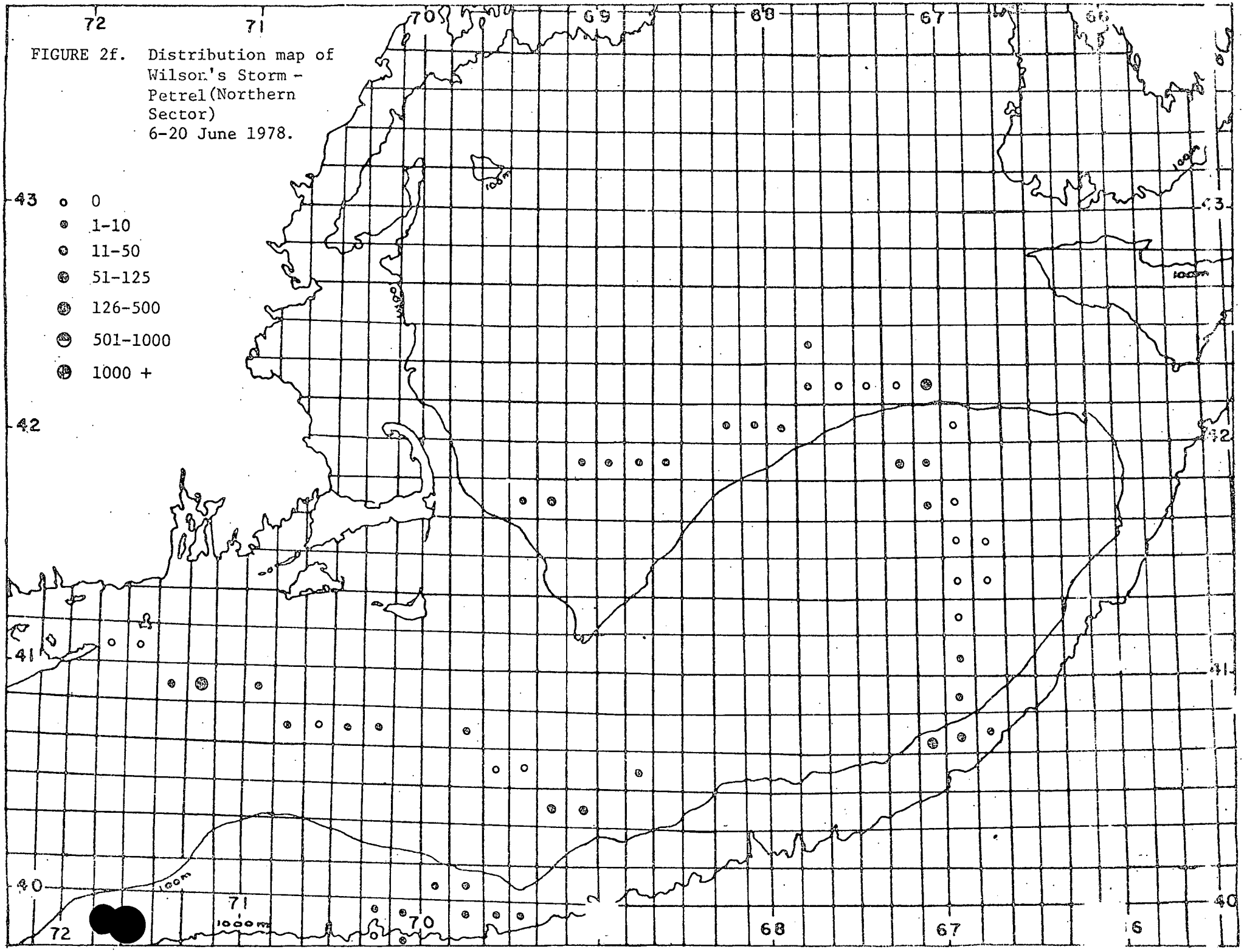

FIGURE 2f. Distribution map of Wilson's Storm - Petrel (Northern Sector) 6-20 June 1978.

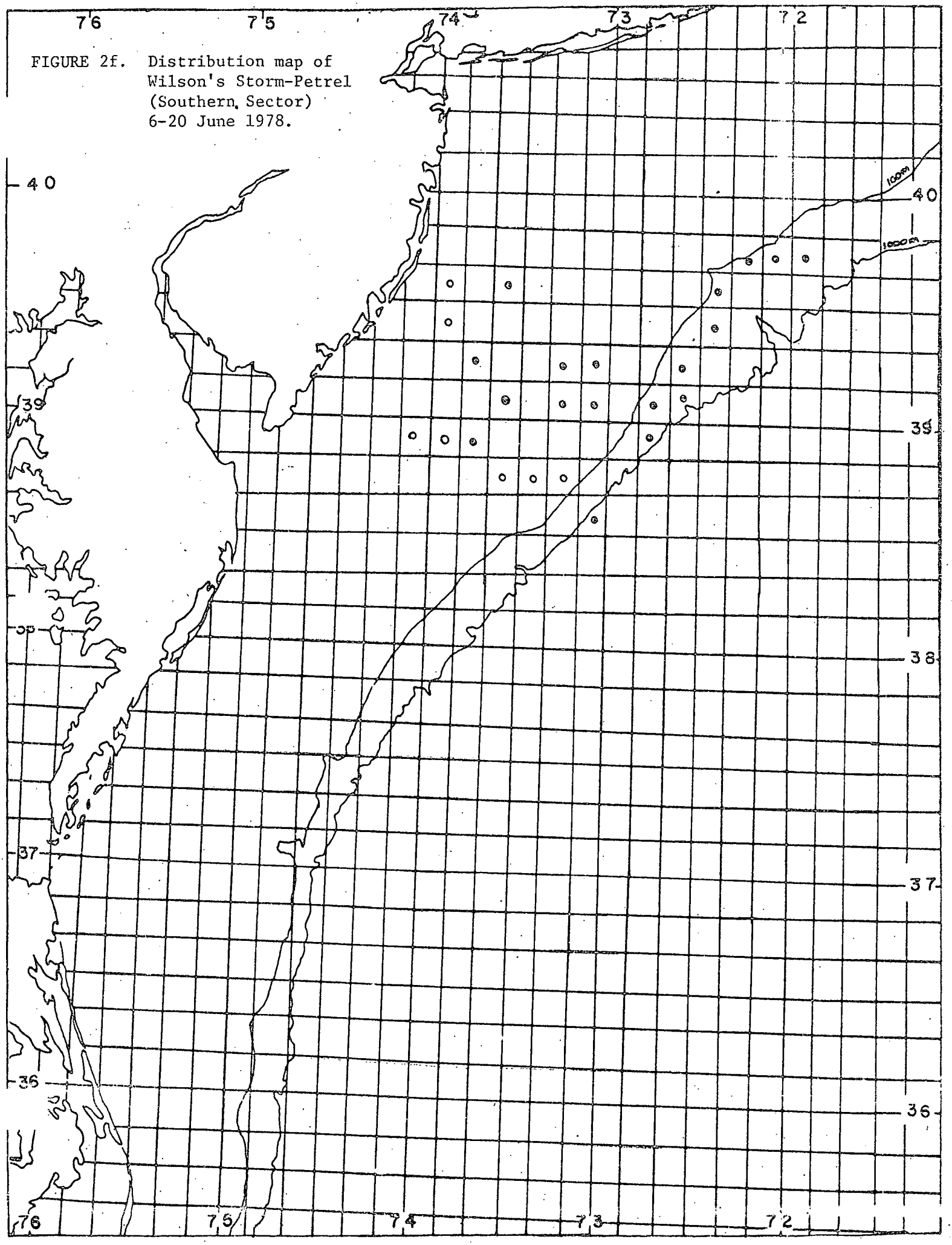

FIGURE 2f. Distribution map of Wilson's Storm-Petrel (Southern Sector) 6-20 June 1978.

Cruise No. 7812

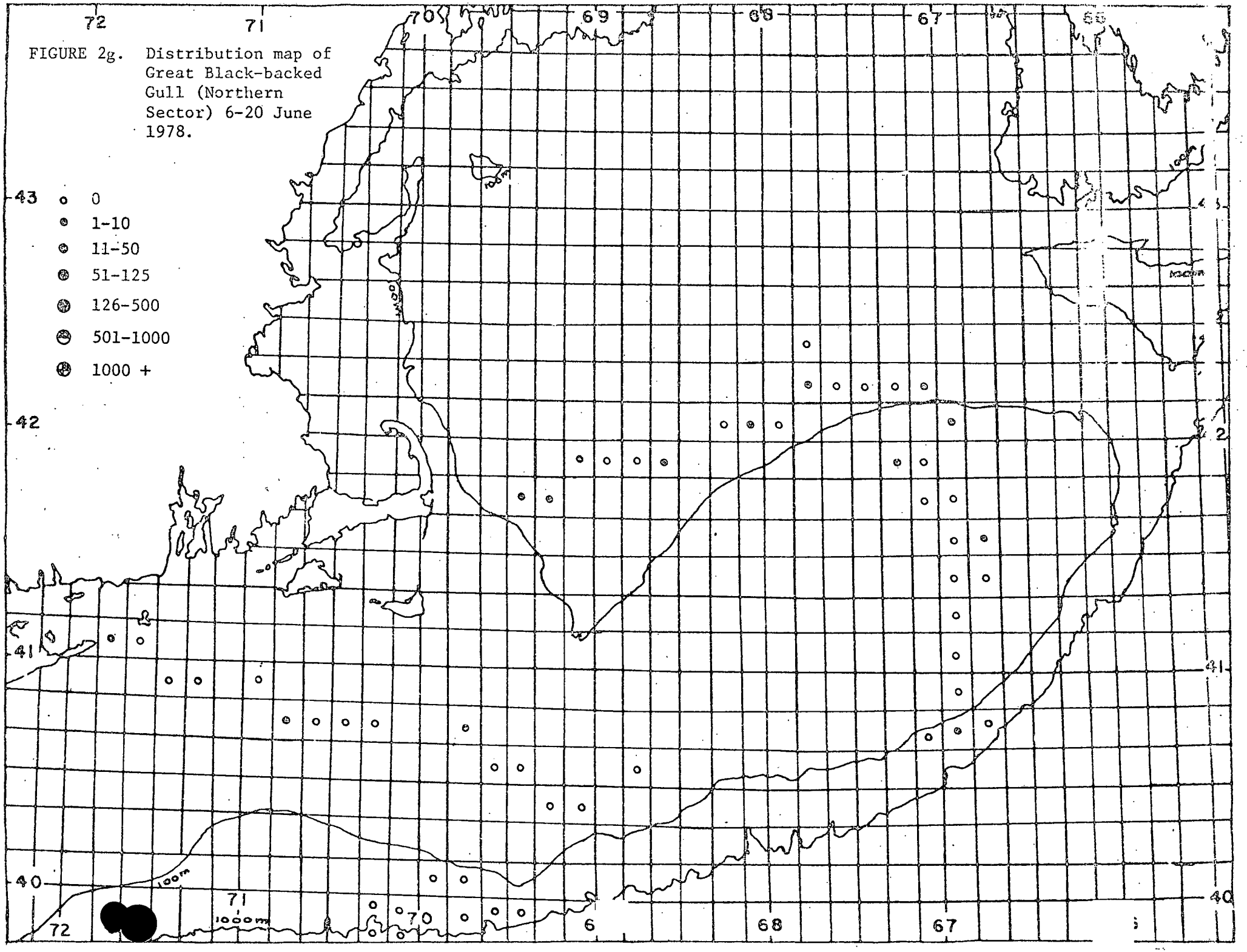

FIGURE 2g. Distribution map of Great Black-backed Gull (Northern Sector) 6-20 June 1978.

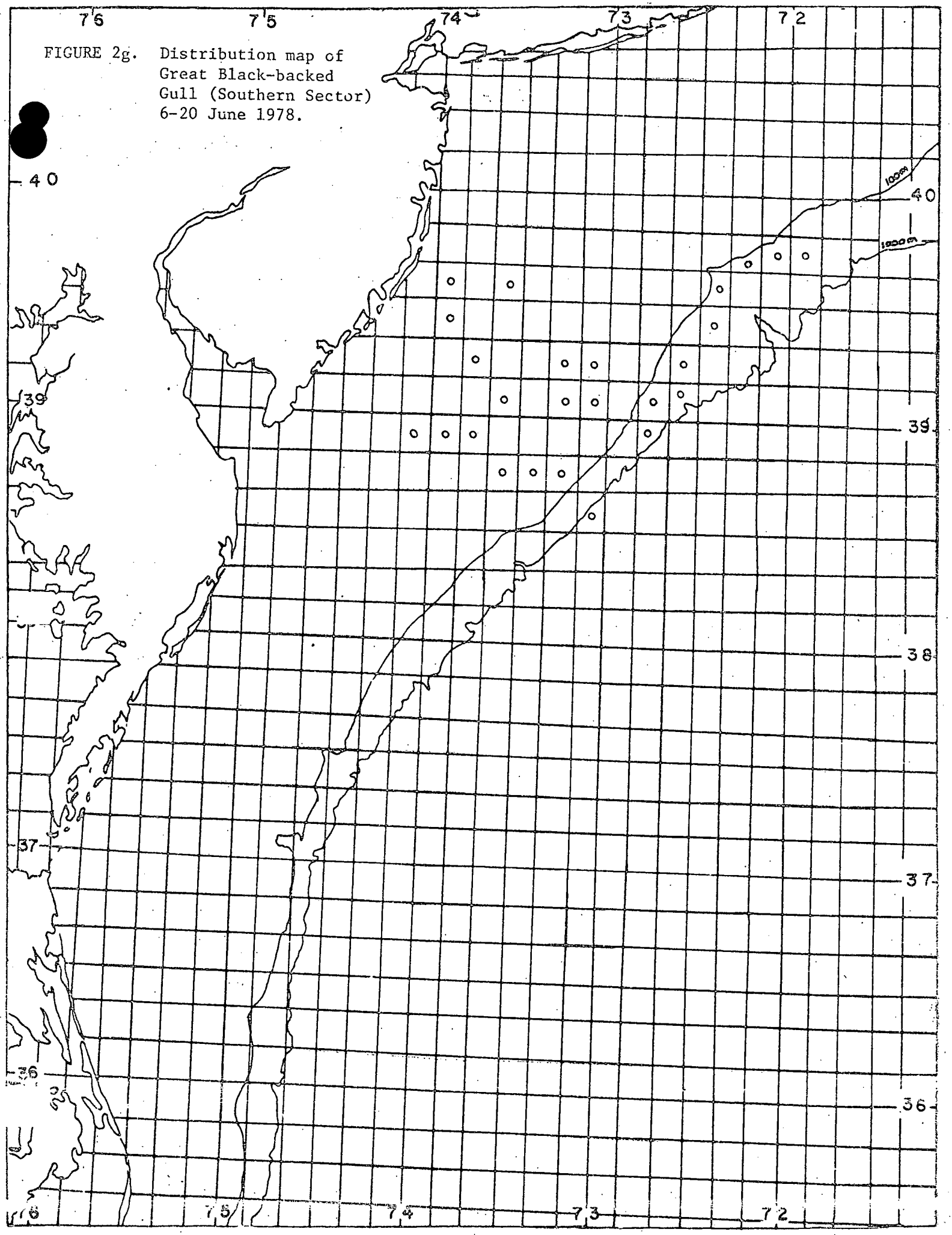

FIGURE 2g. Distribution map of Great Black-backed Gull (Southern Sector) 6-20 June 1978.

Cruise No. 7812

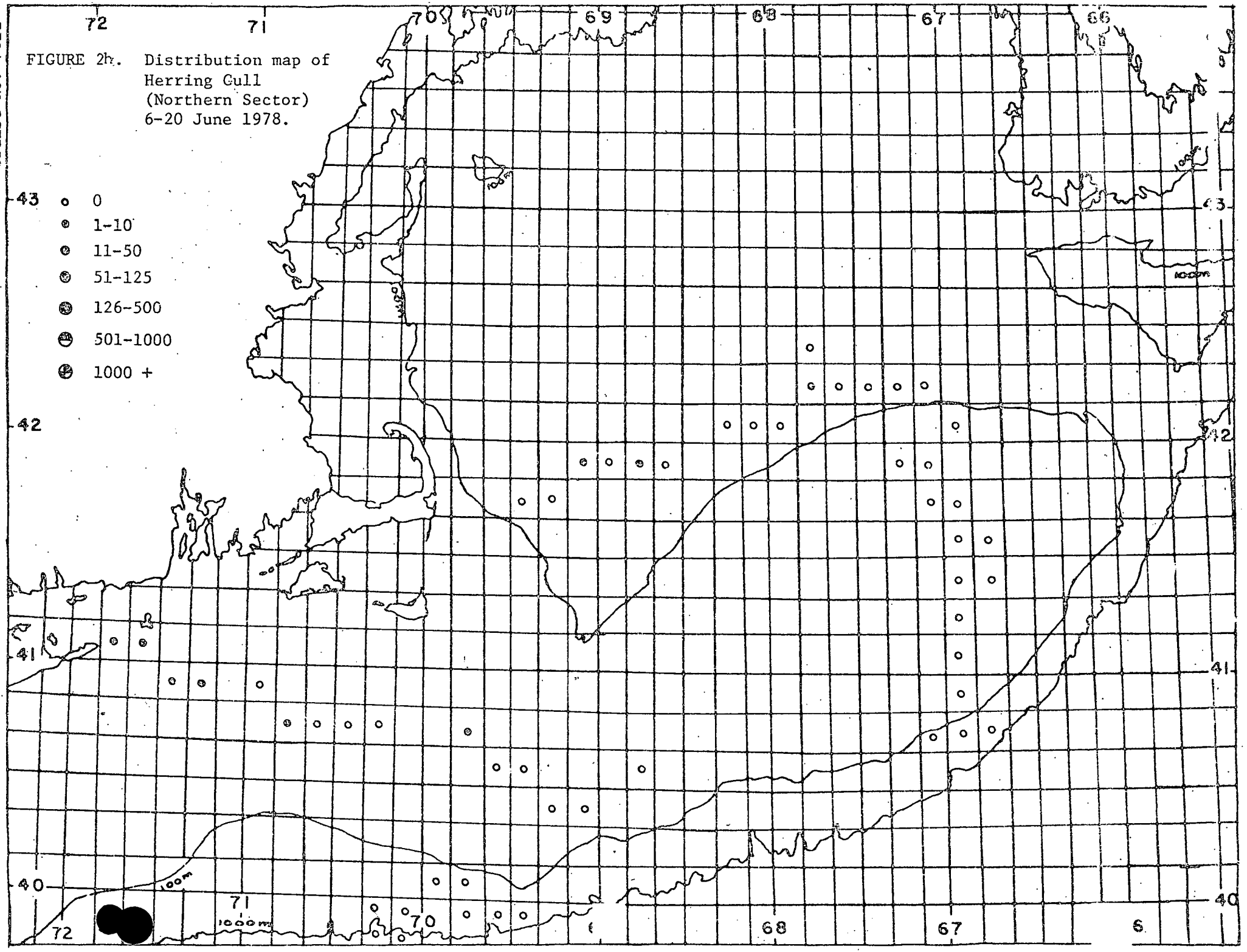

FIGURE 2h. Distribution map of Herring Gull (Northern Sector) 6-20 June 1978.

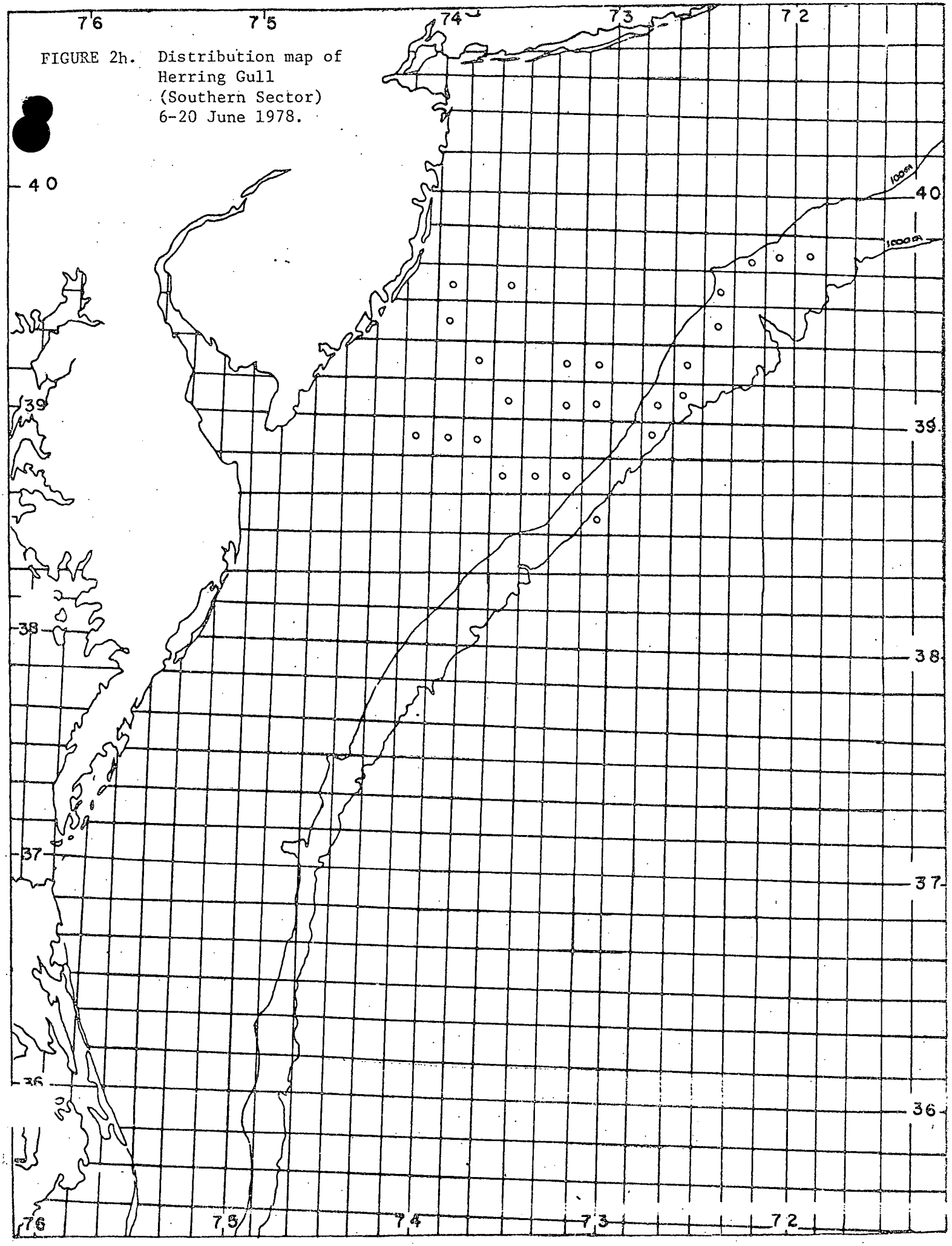

FIGURE 2h. Distribution map of Herring Gull (Southern Sector) 6-20 June 1978.

Cruise No. 7812

TABLE 6. Summary of Transect or Station Census Data.

Ship USCG-C VIGOROUS Observers RRV

Transect ☑ Station ☐ No.	1	2	3	4	5	6	7	8	9	10	11	12			
Date(GMT) 1978	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/7	6/7			
Region*	SC	SC	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	GB	GB			
Latitude(to nearest min.)	41°09'	41°35'	41°34'	41°32'	41°35'	41°30'	41°28'	41°26'	41°24'	41°21'	41°25'	41°24'			
Longitude(to nearest min.)	71°48'	71°35'	71°34'	71°32'	71°32'	71°32'	71°31'	71°30'	71°32'	71°33'	69°53'	69°53'			
Water depth(meters)	42	42	42	48	57	53	57	60	57	53	95	95			
Total F.A. Birds	5	7	1	10	436	4	1	2	0	3	10	6			
Area Sampled(km^2)	1.1	1.1	.7	1.1	.9	1.1	1.2	1.1	1.1	1.3	0.6	.8			
Density (birds/km^2)	4.5	6.4	1.4	9.1	484.4	3.6	0.8	1.8	0	2.3	16.7	7.5			
Species	Number Observed														
Common Tern F.A.	3	3													
Tot.	5	28													
Herring Gull F.A.	1	3	1	0	10			1							
Tot.	1	6	3	1	10			1							
Gr Black-backed Gull F.A.	1							1							
Tot.	4							1							
Unidentified Jaeger F.A.	0				0										
Tot.	1				2										
Common Loon F.A.		1													
Tot.		1													
Greater Shearwater F.A.				1	375	1				3	8	4			
Tot.				1	375	2				4	19	15			
Sooty Shearwater F.A.				7	300					0	1				
Tot.				8	2000					1	3				
Wilson's Storm-Petrel F.A.				2	50	2		0			1	2			
Tot.				2	250	2		1			9	7			
Unidentified Large Gull F.A.					0	1	0								
Tot.					2000	2	1								
Cory's Shearwater F.A.					1										
Tot.					1										
Pomarine Jaeger F.A.					0		1								
Tot.					1		1								
Unidentified Storm Petrel F.A.									0						
Tot.									1						
Unidentified small alcid F.A.												0			
Tot.												1			

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TABLE 6. Summary of Transect or Station Census Data.

Ship USCGC [illegible] Observers RRV

Transect ☑ Station ☐ No.	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Date (GMT) 1978	6/2	6/7	6/7	6/7	6/2	6/2	6/7	6/2	6/2	6/2	6/2	6/2	6/2	6/7	6/8
Region*	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GM
Latitude (to nearest min.)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	41-40	41-47	41-55	41-59	42-14
Longitude (to nearest min.)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	66-52	67-00	67-09	67-12	67-07
Water depth (meters)	91	99	[illegible]	[illegible]	[illegible]	[illegible]	71	[illegible]	[illegible]	[illegible]	53	38	53	51	199
Total F.A. [illegible]	15	4	7	5	5	5	1	5	11		3	64	518	91	21
Area Sampled (km²)	1.0	1.0	0.7	0.5	0.9	1.0	1.1	[illegible]	.8	[illegible]	.9	.8	.8	.9	.5
Density (birds/km²)	12.0	4.0	10.0	7.5	5.0	5	0.9	5.6	1.8	5.0	3.3	80.0	647.5	101.1	42.0
Species	Number Observed														
Leach's Storm-Petrel F.A.	1														
Tot.	1														
Greater Shearwater F.A.	6	1	3	5	3	2	1	5	8	8	2	35	300	35	12
Tot.	22	16	5	5	6	11	1	5	8		5	135	14,300	35	20
[illegible] Shearwater F.A.	1		1	0					2		0	15	200	20	2
Tot.	3		1	1					2		1	35	9,200	20	3
Wilson's Storm-Petrel F.A.	10	3	2	1	2	1						4	6	15	1
Tot.	[illegible]	8	12	4	6	4						4	6	15	1
Common Eider F.A.	0				0										
Tot.	1				1										
Northern Fulmar F.A.	0	0	0			3					1	6	12	20	6
Tot.	1	1	2			3					1	6	312	20	9
Great Black-backed Gull F.A.										2				1	
Tot.										2				3	
Black-legged Kittiwake F.A.				0											
Tot.				2											
Unid. alcid F.A.												0			
Tot.												1			
[illegible] Tern F.A.									1						
Tot.									1						
Arctic Tern F.A.												4		0	
Tot.												4		12	

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TABLE 6. Summary of Transect or Station Census Data.

Ship USCGC VIGOROUS Observers RRU

Transect ☑ Station ☐ No.	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Date (GMT)	6/5	6/5	6/5	6/5	6/5	6/8	6/8	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6
Region*	GM	GB	GB	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	GM	G
Latitude (to nearest min.)	42-14	42-11	42-10	42-11	42-13	42-20	42-22	41-53	41-52	41-49	41-47	41-46	41-46	41-48	41-49	4
Longitude (to nearest min.)	67-23	67-33	67-44	67-45	67-46	67-44	67-40	69-02	69-06	69-14	69-21	69-28	69-25	69-18	69-11	69
Water depth (meters)	238	210	198	208	227	232	252	134	154	159	192	176	148	177	174	5
Total F.A. Birds	4	27	6	11	5	12	14	2	4	6	2	0	2	7	37	3
Area Sampled (km^2)	.8	.7	.7	.4	.4	.4	.4	.6	.6	.6	.5	.6	1.0	.9	1.1	1.
Density (Birds / km^2)	5.0	38.6	8.6	27.5	12.5	30.0	35.0	3.3	6.7	10.0	4.0	0	2.0	7.8	33.6	4
Species	Number Observed															
Northern Fulmar FA	1	5		2	1	1		1	0	2	1		2		1	
Tot	1	5		2	1	1		5	5	2	5		27		3	
Greater Shearwater F.A.	3	14	4	7	1	8	9	0	0	2			0	3		
Tot.	4	24	10	10	1	8	9	22	5	2			1	3		
S Shearwater F.A.		8	2	1	1	1	4	0		1				1	0	
Tot.		10	3	2	1	1	4	1		1				1	1	
Great Black-backed Gull F.A.			0						11	1	1		0		1	
Tot.			2						11	1	1		6		1	
Wilson's Storm-Petrel F.A.				1	2	2	1	0	3				0	3	35	
Tot.				1	2	2	1	4	9				1	3	35	
Herring Gull F.A.								1								
Tot.								2								
Gannet F.A.												0				
Tot.												2				

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TABLE 6. Summary of Transect or Station Census Data.

Sh[redacted] USCGC VIGOROUS Observers RRV

Transect ☒ Station ☐ No.	45	46	47	48	49	50	51	52	53	54	55	56	57	58
Date (GMT) 1978	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6/11	6/11	6/11	6/11	6/11	6/11	6/12
Region*	Gm	Gm	Gm	Gm	Gm	Gm	GB	GB	GB	GB	GB	GB	GB	GB
Latitude (to nearest min.)	41°50'	[illegible]	41°54'	41°56'	42°00'	42°01'	42°05'	42°11'	42°08'	42°02'	41°58'	41°48'	41°32'	46°34'
Longitude (to nearest min.)	[illegible]	[illegible]	68°42'	68°5	68°14'	68°06'	67°50'	67°03'	66°58'	66°54'	67°00'	66°58'	66°57'	68°43'
Water depth (meters)	[illegible]	150	157	168	220	187	183	184	106	55	59	64	64	60
Total F.A. Birds	8	2	4	0	2	8	7	211	15	32	8	18	0	16
Area Sampled (km²)	1.0	1.0	1.0	1.0	1.0	1.1	1.1	.6	.5	1.7	1.1	1.1	1.1	.9
Density (Birds/km²)	8	2	4	0	2	7.3	6.4	351.7	30	18.8	7.3	16.4	0	17.8
Species	Number Observed													
Northern Fulmar F.A.	2	0	1	0	2	2	2	30	4	8	5	3		1
Tot	2	6	4	5	8	7	21	4030	4006	26	13	5		1
Greater Shearwater F.A.	4	0	1	0	0	4	3	120	6	8	3	8	0	14
Tot	4	2	2	2	3	11	28	25,120	25,007	57	20	9	6	38
other Shearwater F.A.			0		0	2	2	60	3	3	0	7	0	0
Tot			2		2	2	2	2500	2503	15	2	7	4	2
Wilson's Storm-Petrel F.A.	2	0	0	0	0	0	0	0						1
Tot.	2	2	2	1	6	4	10	100						3
Gannet F.A.		0												
Tot.		1												
Herring Gull F.A.		2	2											
Tot		2	2											
Great Black-backed Gull F.A.				0		0		1	1	0				
Tot.				1		1		1	2	1				
Leach's Storm-Petrel F.A.									1					
Tot									1					
Arctic Tern F.A.										13	0			
Tot.										13	2			

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TABLE 6. Summary of Transect or Station Census Data.

Sh[redacted] USCGC VIGOROUS Observers RRV

Transect ☑ Station ☐ No.	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
Date(GMT) 1979	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/13	6/13	6/13	6/17	6/13	6/13	6/12
Region*	GB	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	OO	OO	OO
Latitude(to nearest min.)	40°03'	40°27'	40°24'	40°23'	40°25'	40°37'	40°38'	40°40'	40°42'	[illegible]	40°02'	39°57'	39°42'	39°[illegible]	39°24'
Longitude(to nearest min.)	69°8'	69°[illegible]'	69°[illegible]'	69°[illegible]'	69°16'	69°24'	69°32'	69°38'	69°[illegible]'	69°53'	69°59'	70°[illegible]	70°8'	70°11'	70°16'
Water depth(meters)	64	73	77	79	71	48	51	49	148	137	143	256	[illegible]	[illegible]	2195
Total F.A. Birds	14	26	18	10	6	2	0	2	31	60	4	4	7	1	2
Area Sampled(km²)	.9	.9	.9	.9	.9	.7	1.7	1.7	.6	.7	1.7	1.7	1.7	1.7	1.7
Density (Birds/km²)	15.6	28.9	20.0	11.1	6.7	2.9	0	1.2	51.7	85.7	2.4	2.4	4.1	.6	1.2
Species	Number Observed														
Northern Fulmar F.A.										1					
Tot.										1					
Greater Shearwater F.A.	12	17	8	4	4	1	0	1	27	55	2	1	1	1	
Tot.	162	45	17	10	22	7	4	2	127	105	4	1	1	1	
[illegible] Shearwater F.A.	0	0		1	1	1	0								
Tot.	8	2		1	2	1	1								
Wilson's Storm-Petrel F.A.	2	9	10	4	1			1	4	3	1	2	1		
Tot.	6	15	21	11	1			1	9	7	3	2	1		
Unid. tern F.A.	0														
Tot.	2														
South Polar Skua F.A.											1				
Tot.											1				
Common Puffin F.A.				1											
Tot.				1											
Herring Gull F.A.								0							
Tot.								3							
Great Black-backed Gull F.A.								0							
Tot.								1							
Cory's Shearwater F.A.										1				0	
Tot.										2				1	
Leach's Storm-Petrel F.A.												1	5	0	2
Tot.												1	6	2	

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TABLE 6. Summary of Transect or Station Census Data.

S[illegible] USCGC VIGOROUS Observers RRV

Transect ☐ Station ☐ No.	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Date (GMT) 1978	6/13	6/13	6/13	6/13	[illegible]	6/13	6/14	6/14	6/14	6/14	6/14	6/14	[illegible]	[illegible]	6/14
Region*	00	00	00	00	00	00	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	00
Latitude (to nearest min.)	[illegible]	[illegible]	39°03'	35°36'	[illegible]	38°32'	[illegible]	[illegible]	[illegible]	39°50'	39°57'	[illegible]	[illegible]	[illegible]	[illegible]
Longitude (to nearest min.)	70°16'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	69°56'	69°51'	[illegible]	[illegible]	69°36'	[illegible]	[illegible]	[illegible]	[illegible]
Water depth (meters)	2478	[illegible]	2740	[illegible]	[illegible]	[illegible]	134	120	136	[illegible]	419	132	[illegible]	[illegible]	[illegible]
Total F.A. Birds	6	4	1	0	0	1	5	11	6	10	7	6	9	4	5
Area Sampled (km^2)	1.7	1.7	1.7	1.7	1.7	1.7	.8	.8	.8	.8	.6	.5	.5	.5	.4
Density (Birds/km²)	3.5	2.4	0.6	0	0	0.6	6.3	13.8	7.5	22.5	11.7	12.0	18.0	8.0	12.5
Species	Number Observed														
Cory's Shearwater F.A.	1	1	1	0	0		1			1		0			
Tot.	1	4	1	1	1		1			1		2			
Greater Shearwater F.A.	2	0		0			1	10	4	14	4	4	6		
Tot.	2	1		1			15	21	14	15	14	[illegible]	7		
[illegible] Shearwater F.A.							1	0	0	1	2	1	2		1
Tot.							2	1	1	1	2	3	[illegible]		1
Northern Fulmar F.A.															
Tot.															
Leach's Storm-Petrel F.A.	2	2	0		0	0									
Tot.	3	2	1		1	1									
Wilson's Storm-Petrel F.A.	1					1	2	0	2	2	1	0	1	4	4
Tot.	1					1	2	2	4	2	1	4	[illegible]	6	10
Unidentified Storm-Petrel F.A.		1													
Tot.		1													
Unidentified Jaeger F.A.								1							
Tot.								1							
Gannet F.A.												1			[illegible]
Tot.												1			
Laughing Gull F.A.												0			
Tot.												1			

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TABLE 6. Summary of Transect or Station Census Data.

Sh[illegible] USCGC VIGOROUS Observers RRV

Transect ☑ Station ☐ No.	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
Date(GMT)	6/14	6/15	6/15	6/15	6/15	6/15	6/15	6/15	6/15	6/15	6/15	6/15	6/12	6/12	6/12
Region*	OO	SNE	SNE	SNE	SNE	SNE	SNE	SNE	SNE	MA	MA	MA	MA	MA	MA
Latitude(to nearest min.)	39°[illegible]'	39°[illegible]	39°45'	39°40'	39°34'	39°32'	39°25'	39°12'	39°14'	39°08'	39°02'	38°57'	39°[illegible]'	39°09'	39°04'
Longitude(to nearest min.)	70°19'	71°[illegible]	72°00'	72°2'	72°22'	72°21'	72°29'	72°44'	72°45'	72°48'	72°52'	72°52'	73°09'	73°07'	73°06'
Water depth(meters)	382	179	157	119	71	329	117	115	113	113	112	101	62	68	64
Total F.A Birds	1	0	1	3	2	1	2	1	1	5	1	5	5	0	5
Area Sampled(km^2)	.4	.6	.6	.7	.6	.6	1.0	1.2	1.2	1.2	1.2	.8	.8	.8	1.4
Density (Birds/km^2)	2.5	0	1.7	4.3	3.3	1.7	2.0	0.8	0.8	4.2	0.8	6.3	6.3	0	3.6
Species	Number Observed														
Cory's Shearwater F.A.										1			2		2
Tot.										1			4		3
Greater Shearwater F.A.		0		0							1		0	0	1
Tot.		2		2							1		1	1	1
[illegible]ty Shearwater F.A	0		1										1		
Tot.	1		1										1		
Wilson's Storm-Petrel F.A	1	0	0	3	2	1	2	1	1	4	0	5	2	0	2
Tot.	3	1	2	8	5	2	2	1	1	7	1	5	3	4	3

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TABLE 6. Summary of Transect or Station Census Data.

Sh[illegible] USCGC VIGOROUS Observers RRV

Transect ☑ Station ☐ No.	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
Date(GMT)	6/17	6/17	6/17	6/18	6/18	6/18	6/18	6/18	6/19	6/19	6/19	6/19	6/19	6/19	6/19
Region*	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA
Latitude(to nearest min.)	39°07'	39°16'	39°34'	39°31'	39°24'	39°12'	39°30'	38°48'	38°39'	38°48'	38°48'	38°49'	38°50'	38°51'	38°53'
Longitude(to nearest min.)	72°13'	72°[illegible]	73°30'	73°54'	73°54'	73°43'	73°31'	73°20'	73°09'	73°17'	73°[illegible]	73°36'	73°45'	73°52'	74°03'
Water depth(meters)	60	53	35	22	24	33	50	71	289	71	71	49	40	42	37
Total F.A. Birds	2	1	8	1	0	1	6	2	7	0	2	0	2	0	0
Area Sampled(km^2)	.6	.6	.7	.6	1.0	1.4	1.4	1.4	.6	1.4	.8	1.0	1.2	1.3	1.3
Density (Birds/km^2)	3.3	1.7	11.4	1.7	0	0.7	4.3	1.4	11.7	0	2.5	0	1.7	0	0
Species	Number Observed														
Cory's Shearwater F.A		0	1			0	0	2	1		1	0	1	0	
Tot.		2	1			1	1	2	1		1	1	1	1	
Greater Shearwater F.A			1			1	1		2		1				
Tot.			1			1	1		2		1				
[illegible]oty Shearwater F.A	0														
Tot.	1														
Wilson's Storm-Bird F.A	2	1	6	1		0	5		4				1		
Tot.	5	3	10	1		1	13		5				1		
Laughing Gull F.A.				0	0										
Tot.				2	1										