

NOAA Technical Report NMFS SSRF-717

**Gulf of Maine-Georges Bank
Ichthyoplankton Collected on
ICNAF Larval Herring Surveys
September 1971-February 1975**

John B. Colton, Jr. and Ruth R. Byron

November 1977



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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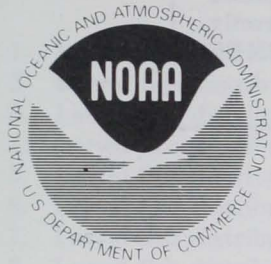
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National Oceanic and Atmospheric Administration

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Gulf of Maine-Georges Bank Ichthyoplankton Collected on ICNAF Larval Herring Surveys September 1971-February 1975

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ABSTRACT

The families, genera, and species of all larval fishes are tabulated and the abundance, length frequencies, and distribution of 12 species and 2 families are summarized utilizing data collected on 8 ichthyoplankton surveys of the Gulf of Maine-Georges Bank area. The segregation of coastal and oceanic species north and south of the coastal/slope water boundary during December is evidenced in a comparison of the distribution of upper 100-m integrated temperature and Atlantic herring, Myctophidae, and Paralepididae larvae. All larval barracudinas and lanternfishes occurred in areas where the integrated temperature was above 11° and 13°C, respectively. Ninety-one percent of positive larval herring tows were in areas where the integrated temperature was below 13°C.

INTRODUCTION

In 1971 the International Commission for the Northwest Atlantic Fisheries (ICNAF) inaugurated a series of cooperative surveys of larval Atlantic herring, *Clupea harengus harengus* L., in the Gulf of Maine-Georges Bank area. The objectives of these surveys were to delimit the major herring spawning grounds and to obtain relative estimates of spawning stock size and information on larval drift and dispersal (International Commission for the Northwest Atlantic Fisheries 1971, 1972). These surveys, incorporating standardized sampling methods and stations, have been continued annually since inception. Vessels from six countries have participated, and 28 full-scale surveys have been completed as of June 1976. In addition, a number of supplementary coastal cruises of more limited scope have been undertaken in connection with this study.

In this paper we present summaries of the abundance, length frequencies, and distribution of the more abundant larval fishes collected on eight cruises by U.S. vessels from September 1971 to February 1975. The data were based on 61-cm, 0.505 mm-mesh bongo net samples collected on the following cruises:

Cruise No.	Date	No. stations
Delaware II 71-4	22 Sept.-3 Oct. 1971	122
Albatross IV 71-7	3-17 Dec. 1971	148
Albatross IV 72-9	28 Nov.-15 Dec. 1972	127
Albatross IV 73-9	4-20 Dec. 1973	113
Albatross IV 74-2	11-22 Feb. 1974	56
Delaware II 74-12	8-12 Oct. 1974	56
Albatross IV 74-13	4-18 Dec. 1974	108
Albatross IV 75-2	15-28 Feb. 1975	87

FIELD AND LABORATORY METHODS

Stations were made sequentially on a standardized grid pattern (International Commission for the Northwest Atlantic Fisheries 1972). At each station a 3.5-knot (6.5-km/h), double-oblique tow was made using paired 61-cm bongo samplers (Posgay and Marak in press) fitted with 0.505-mm and 0.333-mm nylon mesh nets. The sampler accessories (flowmeter, time-depth recorder, towing wire, and wire depressor) were rigged from specifications described by Posgay and Marak (in press). On *Delaware II* Cruise 71-4, the maximum depth of tow was 200 m or approximately 5 m off the bottom. The net was deployed at 50 m/min and retrieved at 20 m/min to 40-m depth. The upper 40 m of the water column was sampled in 20, 2-m intertal steps of 1-min duration. On *Albatross IV* Cruise 71-7 the sampling procedure was similar except that the net was retrieved continuously at 10 m/min from 40 m to the surface. On all other cruises the maximum depth of tow was 100 m or approximately 5 m off the bottom, and the net was deployed at 50 m/min and retrieved at 10 m/min. Pertinent station data for the eight cruises are listed in Tables 3-10.

All samples were processed at the Northeast Fisheries Center, Narragansett Laboratory, National Marine Fisheries Service, NOAA. Fish larvae were sorted from the total 0.505-mm mesh samples and the larvae from each sample enumerated by species or to the lowest taxa possible. For samples having less than 100 of a species, all larvae were measured to the nearest 0.1-mm standard length. The larvae were later combined into 1-mm and 3-mm size groups. In samples containing more than 100 larvae of a species, a subsample of at least 100 specimens was taken for length measurements and the total length frequency for that species determined by multiplying the number at each length interval by the reciprocal of the aliquot fraction.

¹Northeast Fisheries Center, Narragansett Laboratory, National Marine Fisheries Service, NOAA, Narragansett, RI 02882.

The flowmeter readings for each tow were converted to m^3 of water filtered. These values for a given cruise were then plotted against maximum tow depth. Obvious discrepancies in volume values caused by windmilling, etc., were corrected on the basis of average tow depth-volume filtered values. Numbers of larvae per unit volume and numbers under a unit surface area were then determined for each tow.

ICHTHYOPLANKTON SUMMARIES

The families, genera, and species of larval fishes identified on each cruise are summarized in Table 1. The families are arranged in phylogenetic order (based on Greenwood et al. 1966) and the genera listed in alphabetical order. Often the specific identity of larvae could not be ascertained and separation was made only to the generic or family level. This was most often the case for oceanic specimens collected in slope water along the edge of the continental shelf. Because of seasonal and annual differences in the species composition and abundance of larvae, the same taxa were not enumerated for each cruise. We have summarized the abundance, length frequencies, and distribution of larvae on an individual cruise basis and have included only the dominant taxa (Table 2) and species of commercial interest which occurred in at least 5% of the total stations occupied. Larvae of 12 species of fishes are included in this summary, as well as 2 familial groupings:

CLUPEIDAE (herrings)

Clupea harengus harengus - Atlantic herring

GADIDAE (codfishes and hakes)

Gadus morhua - Atlantic cod

Melanogrammus aeglefinus - Haddock

Merluccius bilinearis - Silver hake

Pollachius virens - Pollock

Rhinonemus cimbrius - Fourbeard rockling

Urophycis chuss - Red hake

AMMODYTIDAE (sand lances)

Ammodytes dubius - Northern sand lance

STROMATEIDAE (butterfishes)

Peprilus triacanthus - Butterfish

BOTHIDAE (lefteye flounders)

Citharichthys arctifrons - Gulf Stream flounder

Scophthalmus aquosus - Windowpane

PLEURONECTIDAE (righteye flounders)

Glyptocephalus cynoglossus - Witch flounder

MYCTOPHIDAE (lanternfishes)

PARALEPIDIDAE (barracudinas)

Statistics for individual taxa were calculated for each cruise using the dominance-frequency method of Fager and McGowan (1963). These statistics are summarized in Table 2. The abundance (no./100 m^3) of species and families for individual cruises and stations are listed in Tables 3-10. The species length frequencies for individual cruises are given in Tables 11-14. The distributions (no./10 m^2) of species and families are shown

in Figures 1-8. The no./100 m^3 values listed in Tables 3-10 can be converted to no./10 m^2 by multiplying these values by $d/10$, where d is the sample depth.

DISCUSSION

A conspicuous and significant aspect of the larval fish distribution is the almost total segregation of coastal (boreal) and oceanic (tropical and subtropical) species north and south of the 100-m isobath during the December surveys. This divergence coincided with the location of the coastal/slope water boundary (thermal front) which is manifest in the surface layer (upper 100 m) along the edge of the continental shelf during November-January (Colton and Stoddard 1972). In late winter and spring, the surface thermal front is located further (approximately 20 km) offshore (Wright 1976), and oceanic, vertebrate and invertebrate indicator species do not occur along the edge of the shelf (Colton 1961; Colton et al. 1962). In late summer and early fall when shelf water temperatures are maximum, the surface thermal front is no longer present (Colton and Stoddard 1972), and oceanic indicator species are frequently found over Georges Bank and contiguous areas (Figure 1; Colton 1961; Colton et al. 1962).

To illustrate the relationship of temperature to the distribution of coastal and oceanic larval fish species during December, we determined integrated temperatures to maximum depth of 100 m, or to the bottom in shoaler areas, using *Albatross IV* Cruise 74-13 expendable bathythermograph values at standard depths of 0, 10, 20, 30, 50, 75, and 100 m. The distribution of these integrated temperatures and a plot of the abundance of larval Atlantic herring, Myctophidae, and Paralepididae versus integrated temperature values are shown in Figure 9. All larval barracudinas and lanternfishes were collected in areas where the integrated temperature was above 11° and 13°C respectively. Ninety-one percent of the positive larval herring tows were made in areas where the integrated temperature was below 13°C and 80% of the positive tows were below 11°C.

We do not imply that the observed distribution patterns of larval fishes are controlled directly by temperature. Laboratory experiments have shown the upper lethal temperature (and salinity) for early stage larval herring to be appreciably higher than the temperature-salinity values characteristic of slope water (Blaxter 1960; Holliday and Blaxter 1960). There are marked differences in abundance, species composition and species diversity of zooplankton between coastal and slope water. The mean standing crop is greater in coastal water and the number of species greater in slope water (Clarke 1940; Grice and Hart 1962). It is possible, therefore, that the distribution of coastal fish species, such as herring, is more contingent on biological factors (availability of suitable zooplankton forage organisms) than on the physical characteristics of their environment. Hopefully, when additional data from these cruises have been processed, we will be able to elucidate the biotic and

abiotic factors controlling seasonal and annual variations in distribution and abundance of coastal and oceanic larval fishes.²

ACKNOWLEDGMENTS

The larval fishes used in this study were sorted and identified by the staff of the Ichthyoplankton Investigation, Northeast Fisheries Center Narragansett Laboratory, National Marine Fisheries Service, NOAA. We thank Susan Senerchia for the initial tabulation of the cruise data, Alice DeNofa and Dorothy Shavers for typing the tables, and Lianne Armstrong for preparing the figures.

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²In the interim, persons desiring more specific information regarding these cruises or wishing to examine specimens from these collections should contact: Thomas McKenney, Northeast Fisheries Center Narragansett Laboratory, National Marine Fisheries Service, NOAA, Narragansett, R.I. 02882.

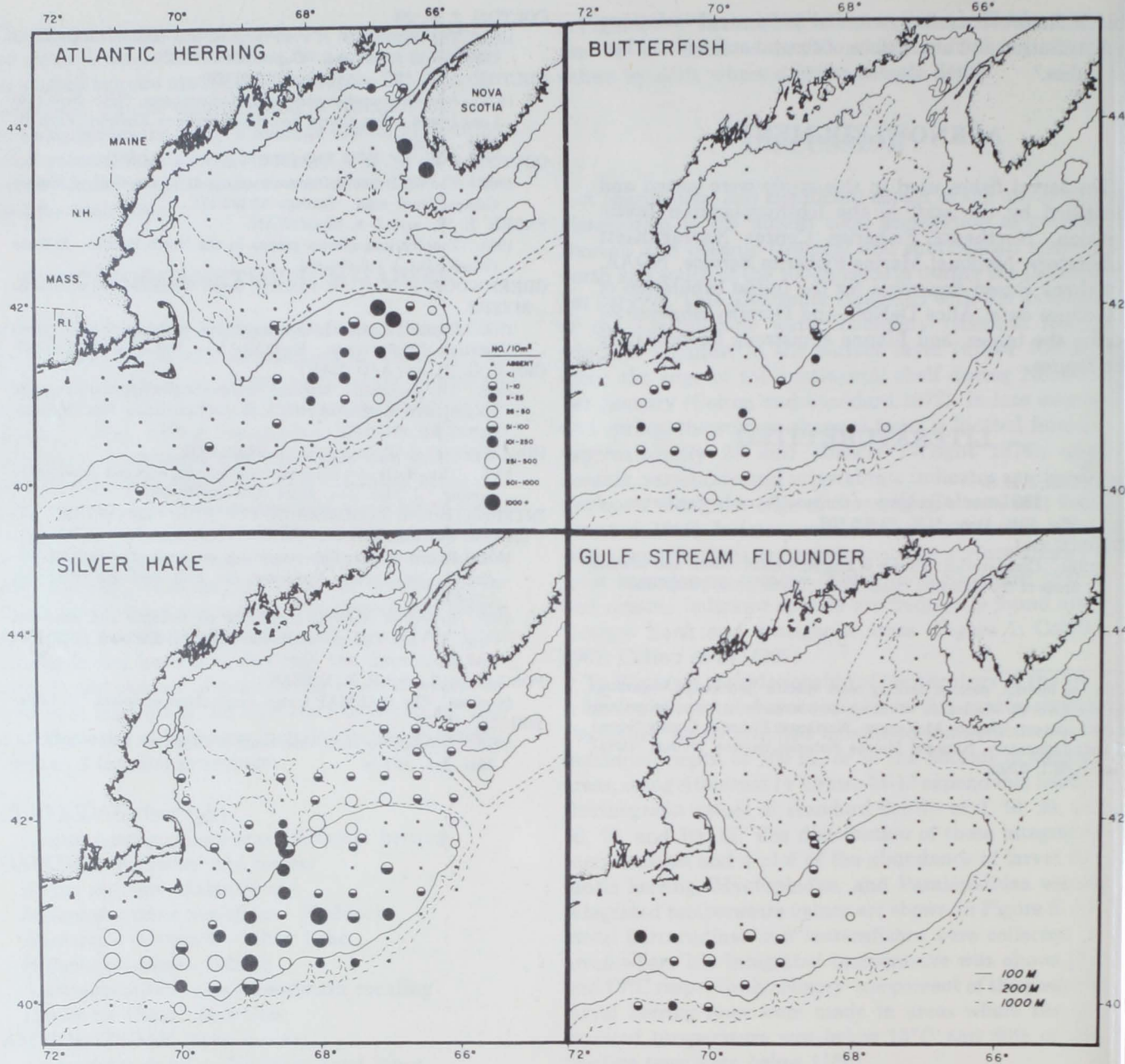


Figure 1.—Larval fish distribution, *Delaware II* Cruise 71-4, 22 September-3 October 1971.

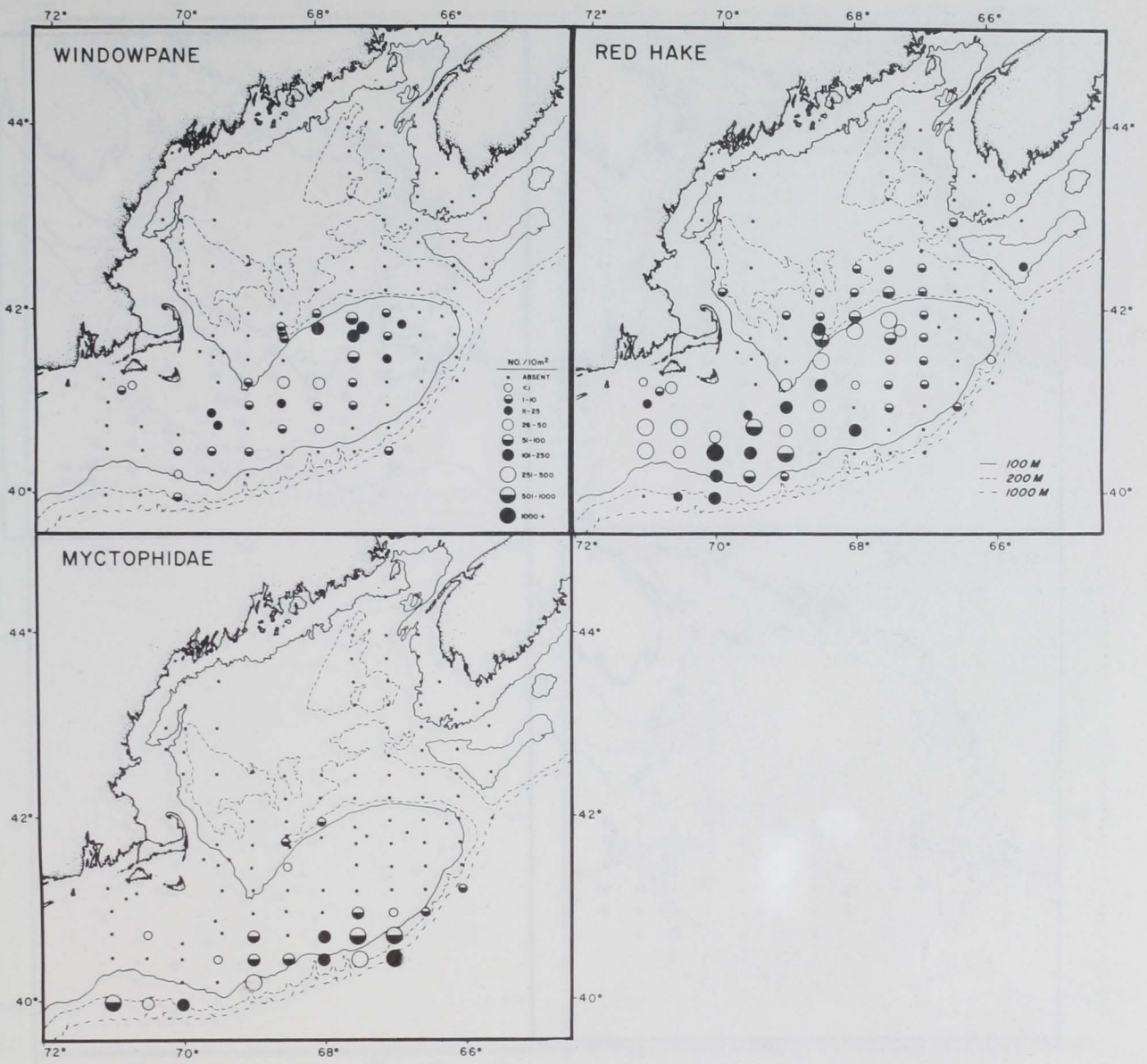


Figure 1.—Continued.

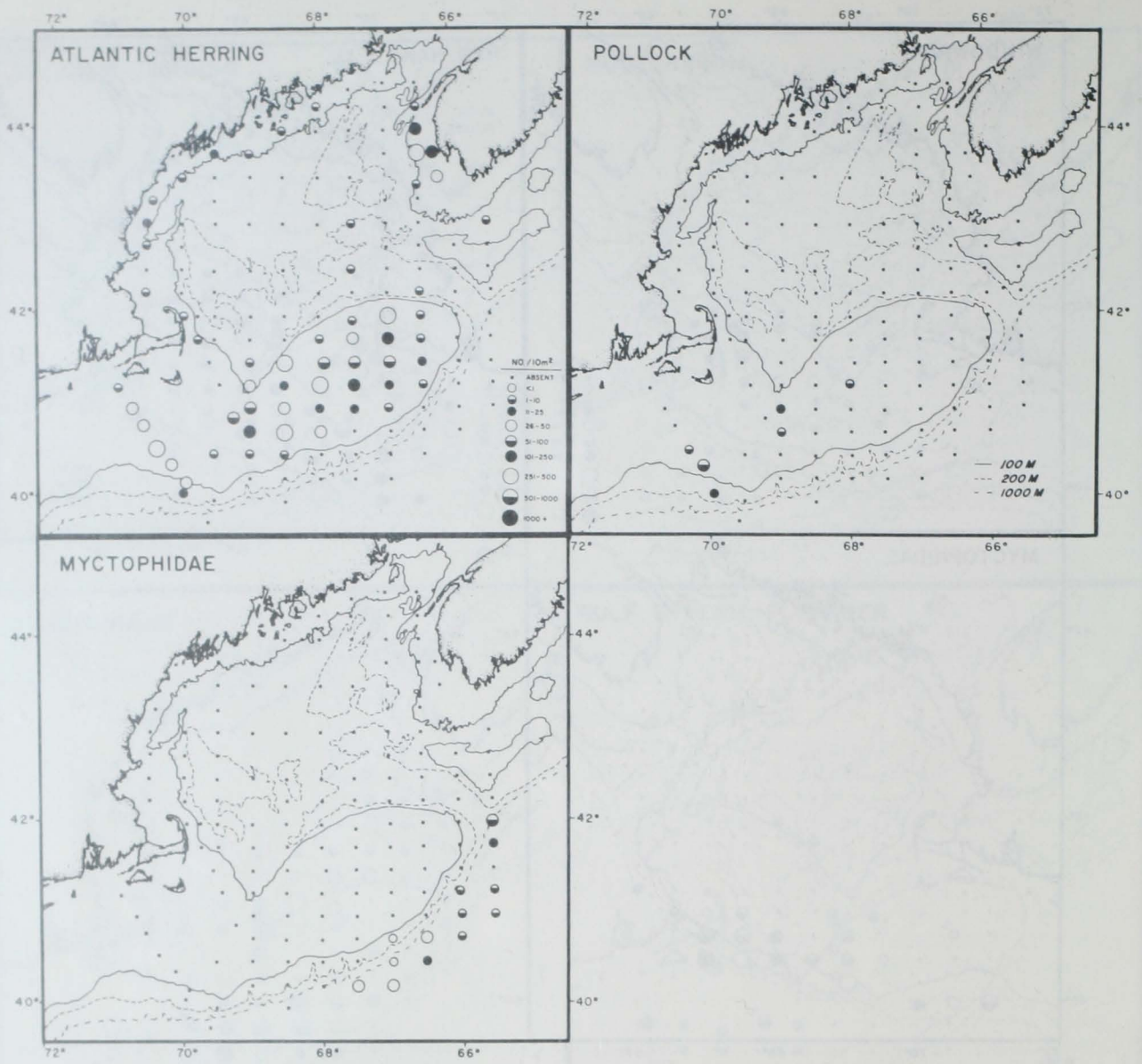


Figure 2.—Larval fish distribution, *Albatross IV* Cruise 71-7, 3-17 December 1971.

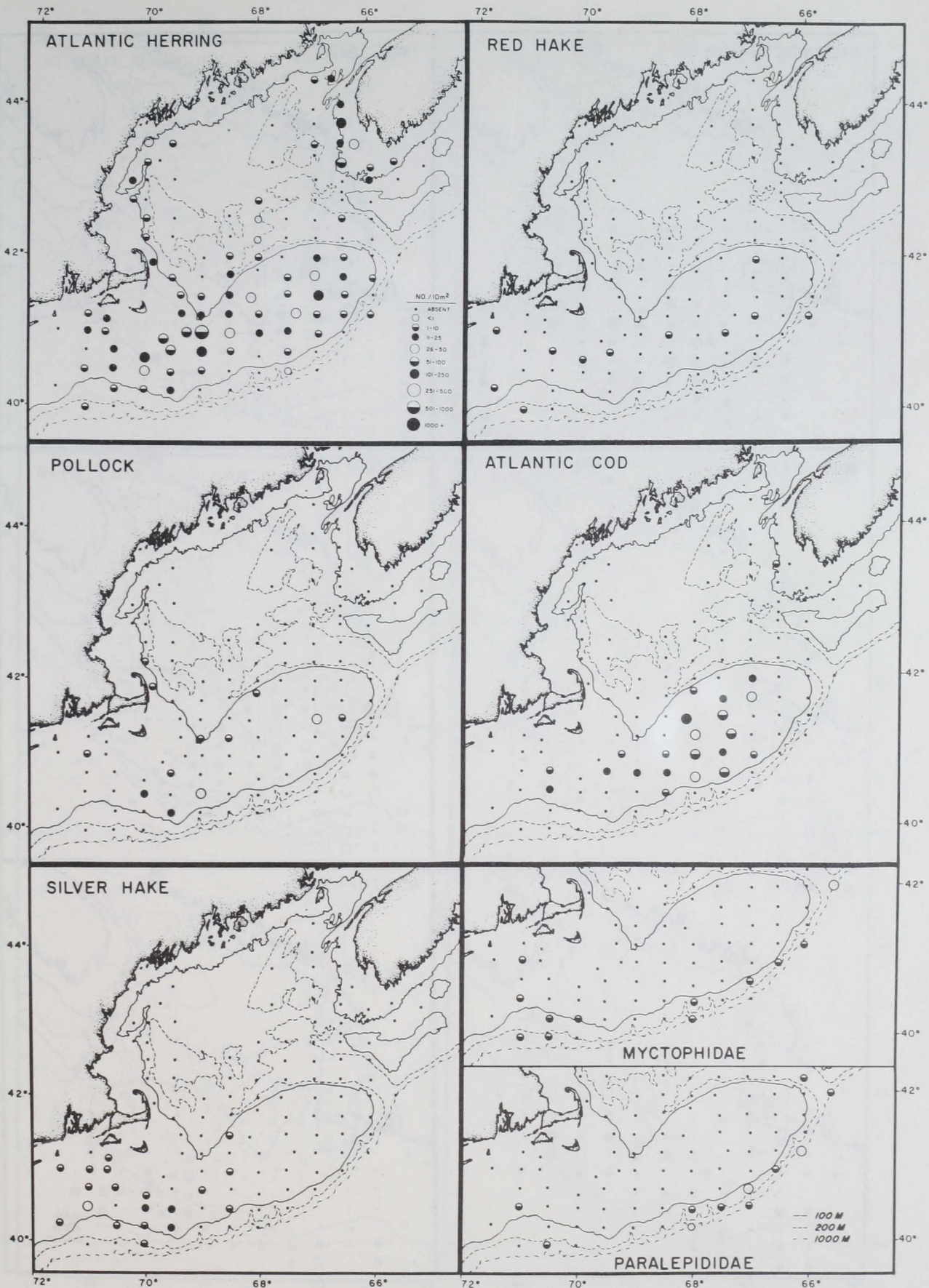
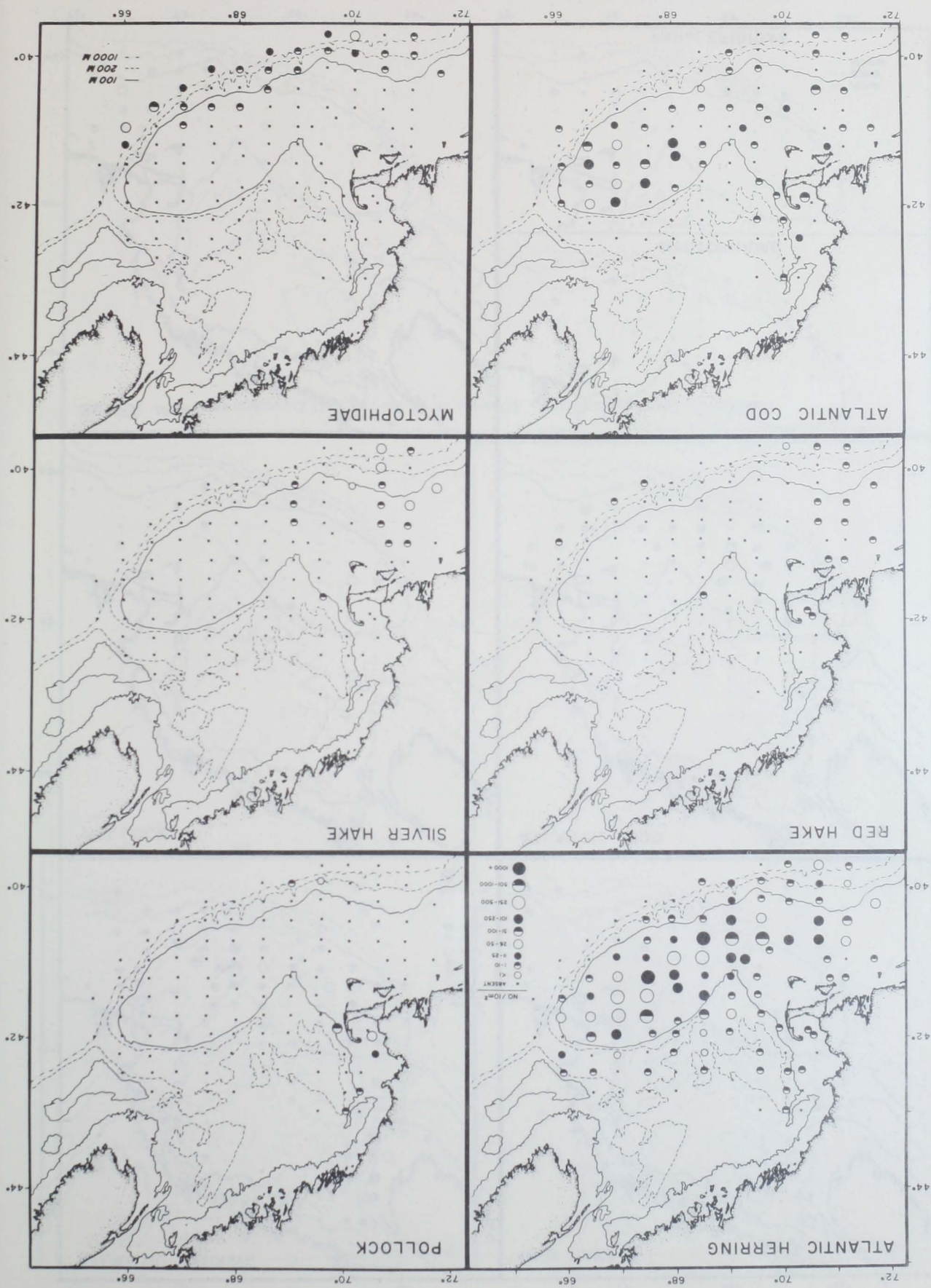


Figure 3.—Larval fish distribution, *Albatross IV* Cruise 72-9, 28 November-15 December 1972.

Figure 4.—Larval fish distribution, Albatross IV Cruise 73-9, 4-20 December 1973.



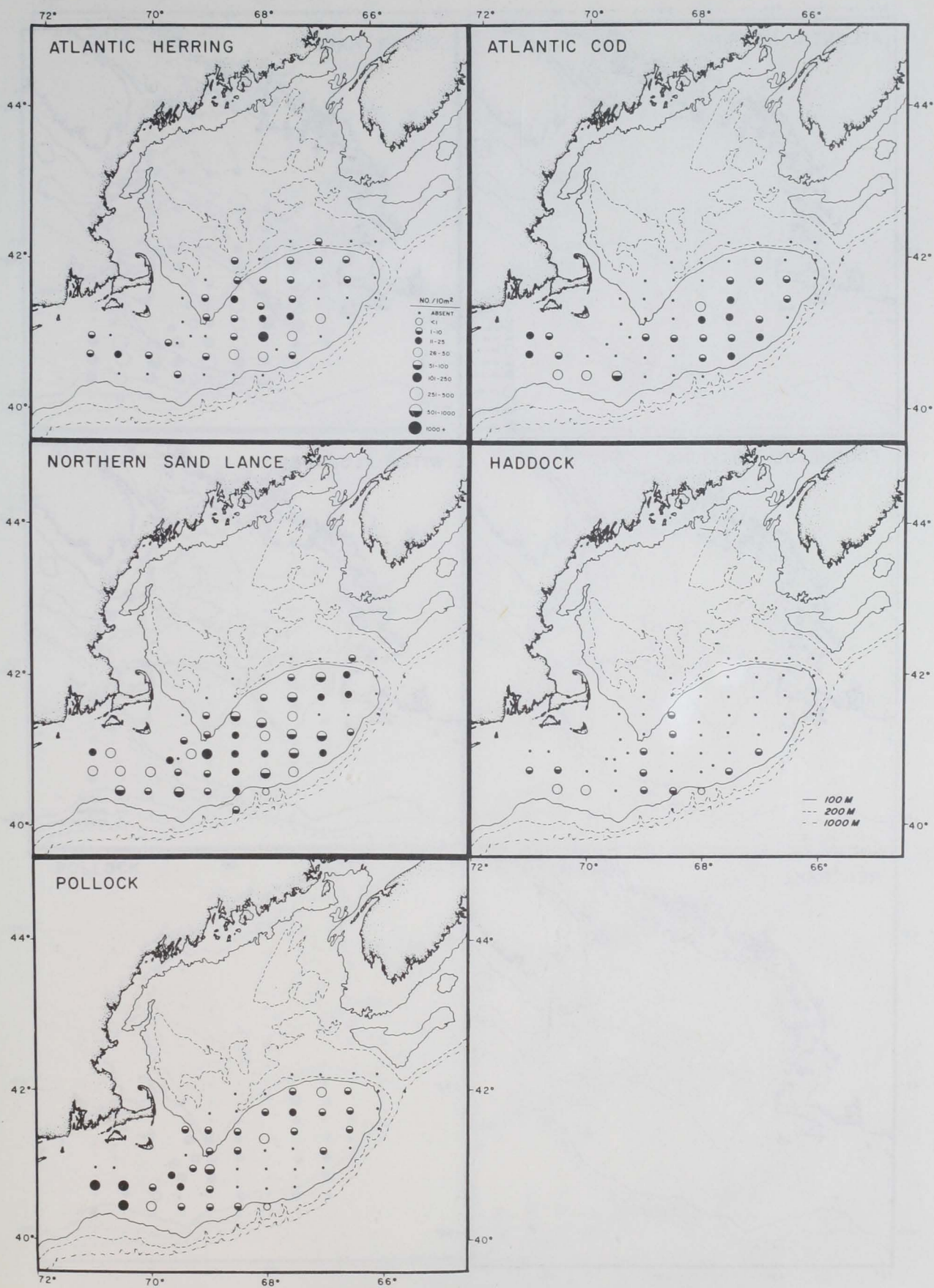


Figure 5.—Larval fish distribution, *Albatross IV* Cruise 74-2, 11-22 February 1974.

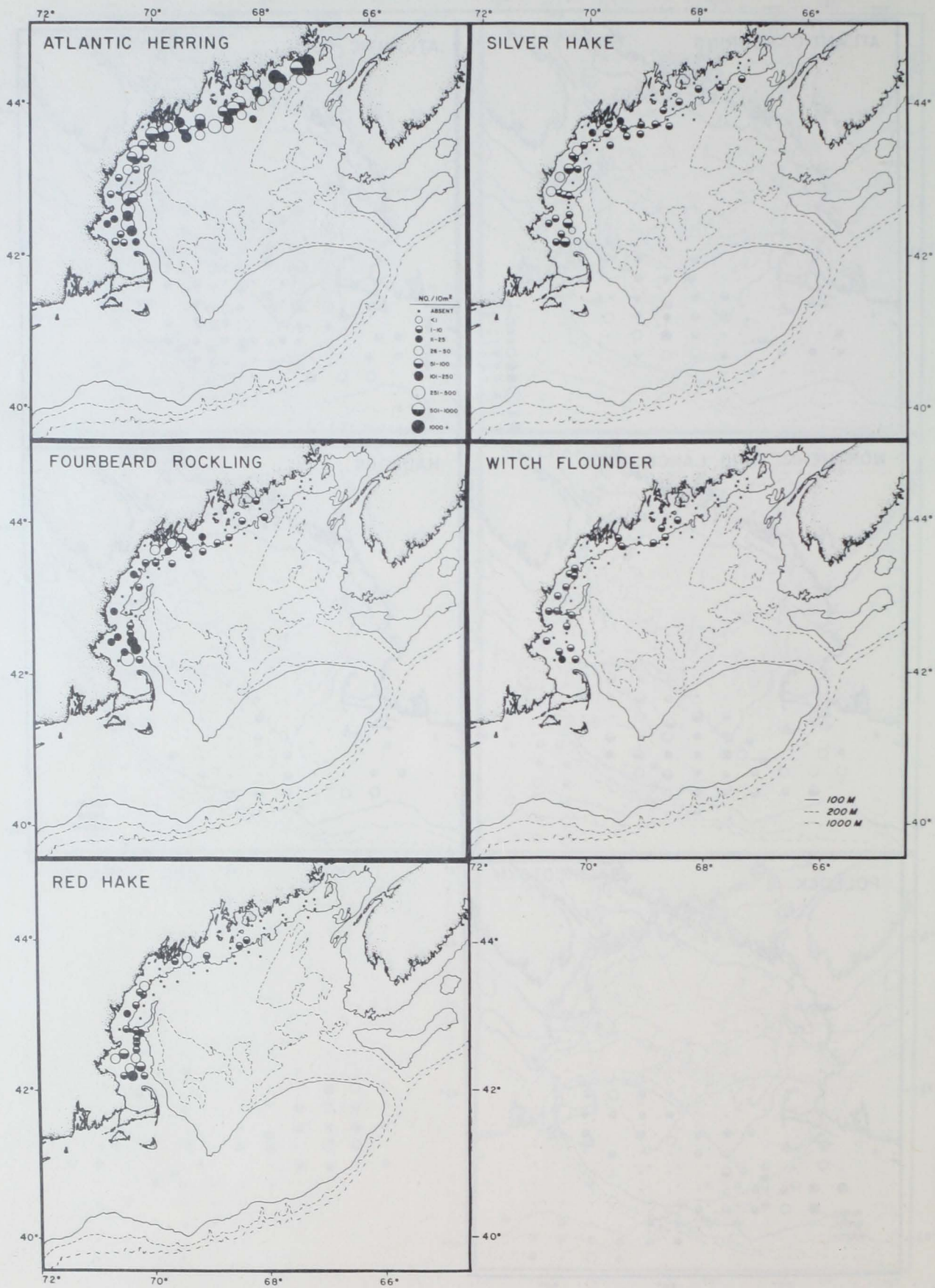


Figure 6.—Larval fish distribution, *Delaware II* Cruise 74-12, 8-12 October 1974.

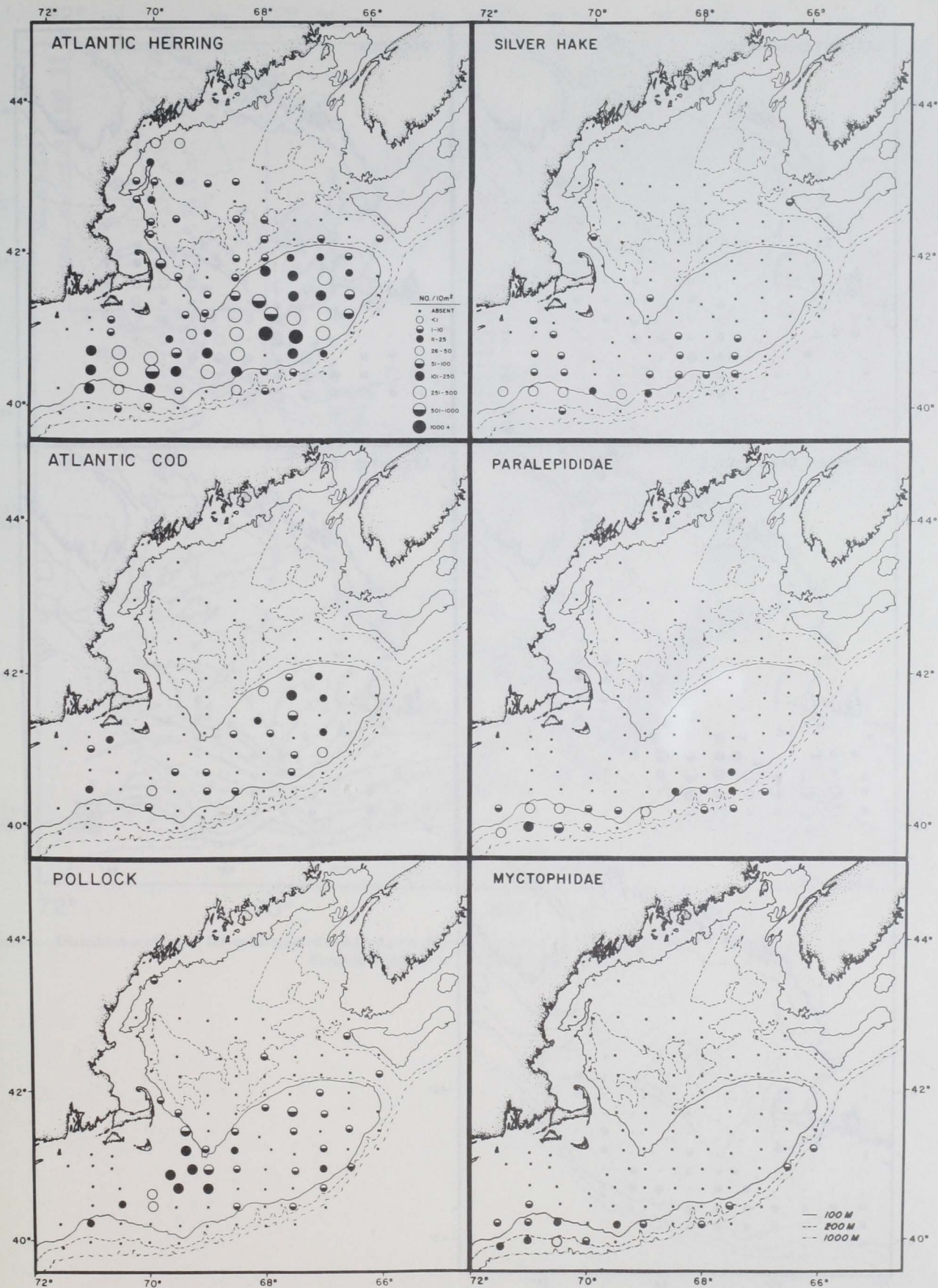


Figure 7.—Larval fish distribution, *Albatross IV* Cruise 74-13, 4-18 December 1974.

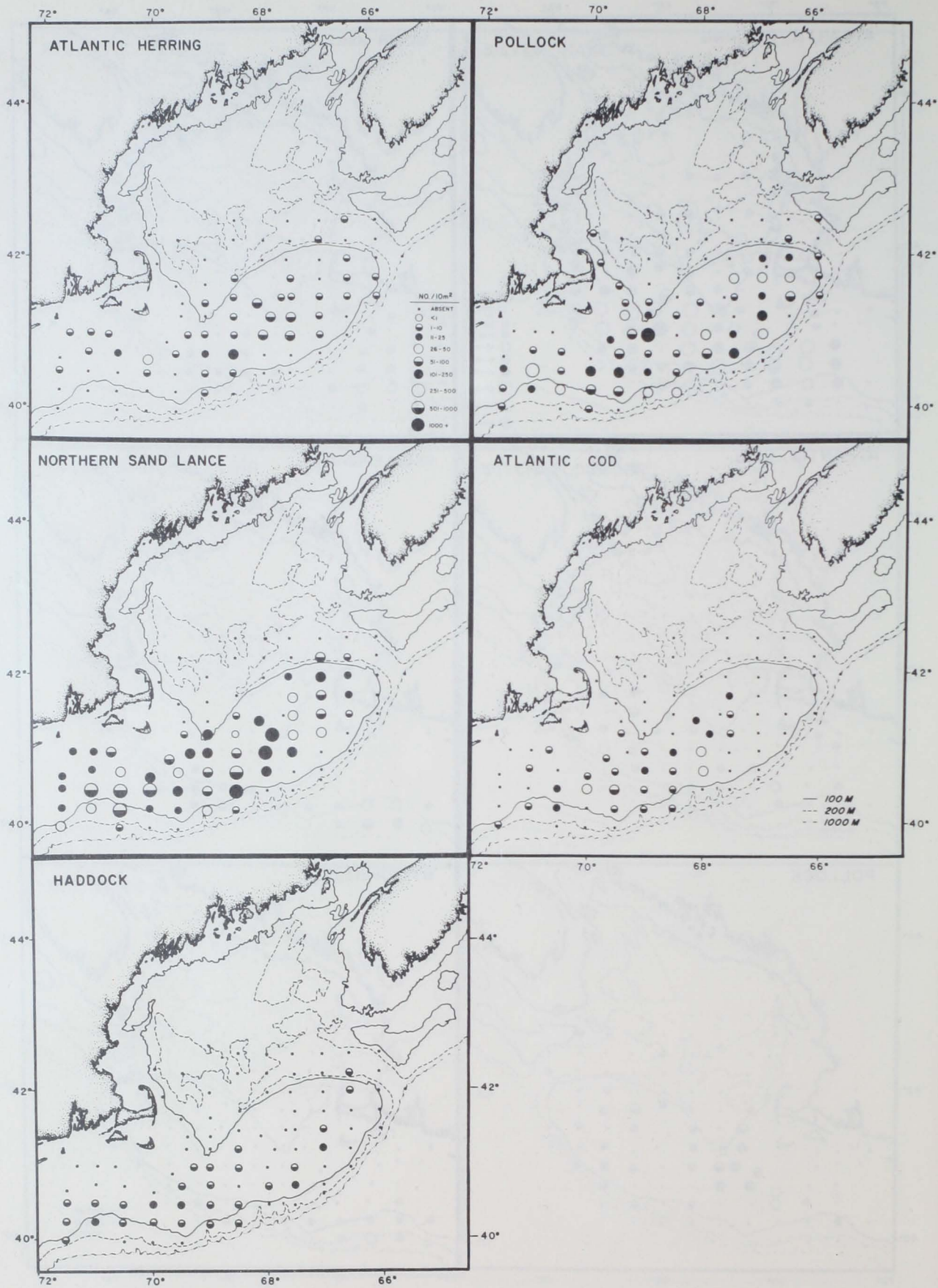


Figure 8.—Larval fish distribution, *Albatross IV* Cruise 75-2, 15-28 February 1975.

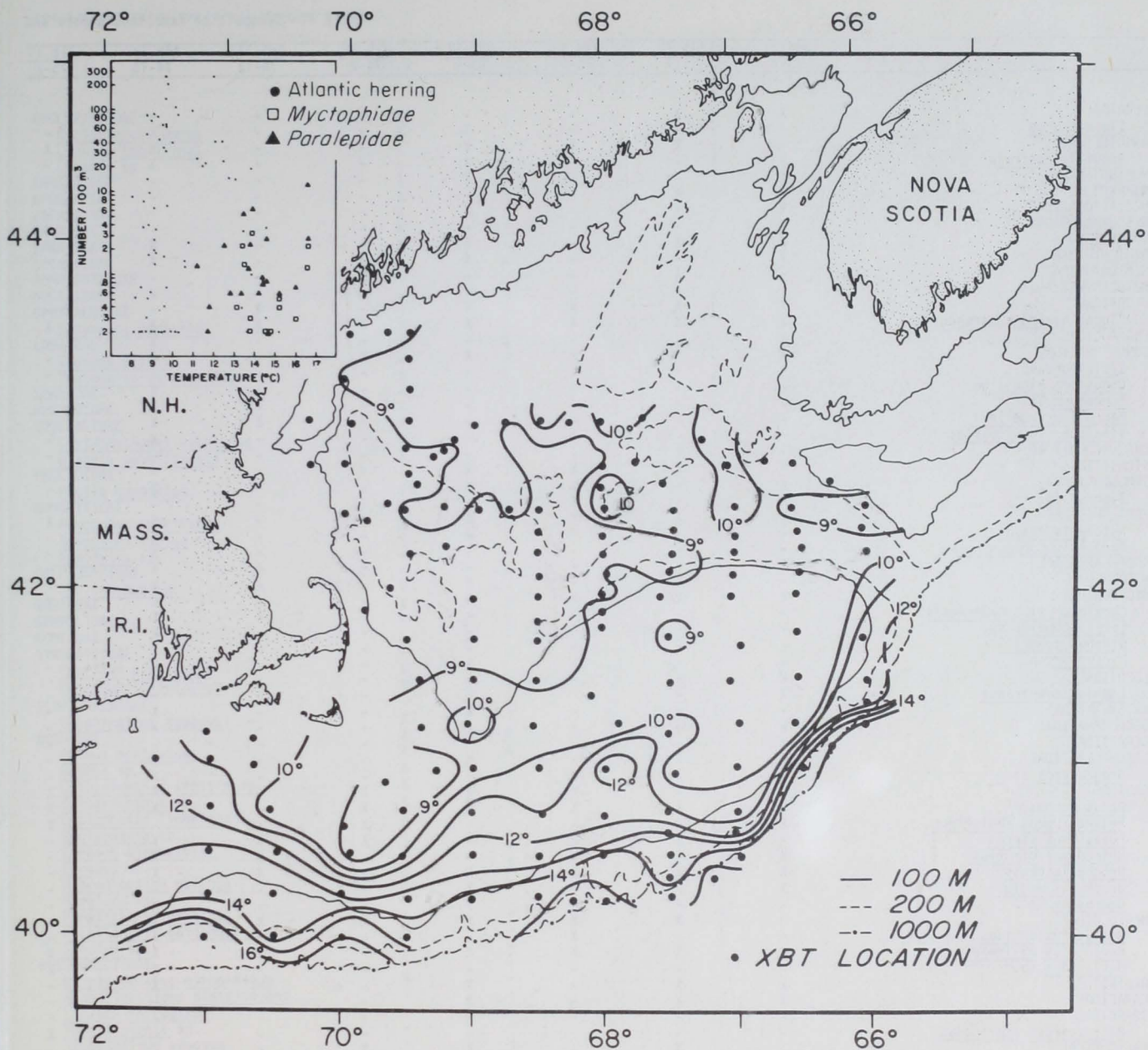


Figure 9.—Distribution of upper 100-m integrated temperatures and their relationship to the distribution of Atlantic herring, Myctophidae, and Paralepididae larvae, *Albatross IV* Cruise 74-13.

TABLE 1.—Synopsis of families, genera and

	DeI.II 71-4	A1b.IV 71-7	A1b.IV 72-9	A1b.IV 73-9	A1b.IV 74-2	DeI.II 74-12	A1b.IV 74-13	A1b.IV 75-2
ELOPIDAE ¹	X	X	-	-	-	-	-	-
<i>Elops saurus</i>	-	-	-	X	-	-	X	-
ANGUILLIDAE	-	X	X	X	-	-	X	X
<i>Anquilla rostrata</i>	-	-	-	-	-	-	X	-
MORINGUIDAE	X	-	-	X	-	-	-	-
MURAEINIDAE	X	X	-	-	-	-	-	-
NETTASTOMATIDAE	X	-	-	X	-	-	-	-
NESSORHAMPHIDAE	-	-	-	-	-	-	-	X
CONGRIDAE	X	X	-	X	-	-	X	X
OPHICHTHIDAE	X	-	-	X	-	-	X	-
NEMICHTHYIDAE	-	X	-	-	-	-	-	-
NOTOCANTHIFORMES	-	-	-	-	-	-	X	-
CLUPEIDAE	X	X	-	X	-	X	-	-
<i>Clupea harengus harengus</i>	X	X	X	X	X	X	X	X
ENGRAULIDAE	X	-	-	-	-	-	X	-
GONOSTOMATIDAE	X	X	X	X	X	-	X	-
<i>Cyclothone</i> sp.	-	-	-	-	-	-	X	-
<i>Gonostoma elongatum</i>	-	-	-	-	-	-	X	-
<i>Gonostoma</i> sp.	-	-	-	-	-	-	X	-
<i>Maurolicus muelleri</i>	-	-	-	-	-	X	X	-
<i>Vinciguerria nimbaria</i>	-	-	-	-	-	-	X	-
CHAULIODONTIDAE	-	X	-	-	-	-	-	-
STOMIATIDAE	-	X	X	X	-	-	-	-
SYNODONTIDAE	X	-	X	X	-	-	X	-
<i>Synodus</i> sp.	-	-	X	-	-	-	-	-
PARALEPIDIDAE	X	X	X	X	X	-	X	X
<i>Notolepis rissoi</i>	-	-	-	-	-	-	X	-
<i>Paralepis coregonoides</i>	-	-	-	-	-	-	X	-
SCOPELARCHIDAE	-	-	-	-	-	-	X	-
NOTOSUCIDAE	-	X	-	X	-	-	X	-
MYCTOPHIDAE	X	X	X	X	-	-	X	X
<i>Ceratoscopelus maderensis</i>	-	-	-	-	-	-	X	-
<i>Ceratoscopelus</i> sp.	-	-	-	-	-	-	X	-
<i>Diaphus dumerili</i>	-	-	-	-	-	-	X	-
<i>Myctophum</i> sp.	-	-	-	-	-	-	X	-
LOPHIIDAE	X	-	-	-	-	-	-	-
<i>Lophius americanus</i>	X	-	-	-	-	-	-	-
ANTENNARIIDAE	-	-	-	X	-	-	X	-
OGCOCEPHALIDAE	X	-	-	-	-	-	-	-
CERATIIDAE	X	-	-	-	-	-	-	-
BREGMACEROTIDAE	-	X	-	X	-	-	X	-
<i>Bregmaceros</i> sp.	-	-	-	-	-	-	X	-
GADIDAE	X	-	X	X	X	-	X	X
<i>Gadus morhua</i>	-	X	X	X	X	-	X	X
<i>Melanogrammus aeglefinus</i>	X	-	-	-	X	-	-	X
<i>Pollachius virens</i>	-	X	X	X	X	X	X	-
<i>Rhinonemus cimbrius</i>	X	X	X	-	-	X	X	-
<i>Urophycis chuss</i>	X	X	X	X	-	X	X	-
<i>Urophycis regius</i>	X	-	-	X	-	-	-	-
<i>Urophycis</i> sp.	-	-	-	-	-	-	X	-
MERLUCCIIDAE	-	X	X	X	-	X	-	-
<i>Merluccius albidus</i>	-	-	X	-	-	-	-	-
<i>Merluccius bilinearis</i>	X	X	X	X	-	X	X	X
<i>Merluccius</i> sp.	-	-	-	-	-	-	X	X
OPHIDIIDAE	X	X	-	X	-	-	X	-
CARAPIDAE	X	X	-	X	-	-	-	-
ZOARCIDAE	-	-	-	-	-	-	-	-
<i>Macrozoarces americanus</i>	-	-	-	-	-	-	-	X
MACROURIDAE	X	X	-	X	X	-	X	-
SCOMBERESOCIDAE	-	-	-	-	-	-	-	-
<i>Scomberesox saurus</i>	-	-	X	-	-	-	-	-
MELAMPHAEIDAE	-	-	-	X	-	-	-	-
GASTEROSTEIDAE	X	X	-	-	-	-	-	-
SYNGNATHIDAE	X	-	-	X	-	-	X	-
SCORPAENIDAE	X	X	-	-	-	-	X	-
<i>Sebastes</i> sp.	X	-	-	-	-	-	-	-
TRIGLIDAE	X	X	-	-	-	-	-	-
COTTIDAE	X	-	-	-	X	-	-	X
<i>Myoxocephalus octodecemspinosus</i>	-	-	-	-	X	-	-	X

¹Families are indicated as being present only when all specimens could not be identified to a lower taxonomic level.

species collected on larval herring surveys.

	DeI. II 71-4	A1b. IV 71-7	A1b. IV 72-9	A1b. IV 73-9	A1b. IV 74-2	DeI. II 74-12	A1b. IV 74-13	A1b. IV 75-2
CYCLOPTERIDAE	X	-	-	-	-	-	X	X
<u>Cyclopterus lumpus</u>	X	-	-	-	-	-	-	-
<u>Liparis inquilinus</u>	-	-	-	-	X	X	-	-
<u>Liparis sp.</u>	-	-	X	X	-	-	-	-
SERRANIDAE	X	-	-	X	-	-	X	-
APOGONIDAE	X	X	-	-	-	-	X	-
CARANGIDAE	X	-	-	-	-	-	-	-
GERRIDAE	X	-	-	-	-	-	-	-
SPARIDAE	X	-	-	-	-	-	-	-
SCIAENIDAE	X	-	-	-	-	-	X	-
POMACENTRIDAE	-	-	-	-	-	-	X	-
MUGILIDAE	-	-	-	X	-	-	-	-
SPHYRAENIDAE	-	-	-	-	-	-	-	-
<u>Sphyraena borealis</u>	X	-	-	-	-	-	-	-
LABRIDAE	X	X	X	X	-	-	X	-
<u>Tautoga onitis</u>	-	-	-	-	-	X	-	-
<u>Tautoglabrus adspersus</u>	X	-	-	-	-	-	-	-
SCARIDAE	-	-	-	X	-	-	X	-
BLENNIIDAE	-	-	-	X	-	-	-	-
STICHAEIDAE	-	-	-	-	-	-	-	-
<u>Cryptacanthodes maculatus</u>	-	-	-	-	X	-	-	-
<u>Ulvaria subbifurcata</u>	X	-	-	-	-	-	-	-
PHOLIDIDAE	-	-	-	-	-	-	-	-
<u>Pholis gunnellus</u>	X	-	-	-	X	X	-	X
AMMODYTIDAE	-	-	-	-	-	-	-	-
<u>Ammodytes americanus</u>	X	-	-	-	-	-	-	-
<u>Ammodytes dubius</u>	-	-	-	-	X	-	-	X
<u>Ammodytes sp.</u>	-	-	-	-	-	-	X	-
CALLIONYMIDAE	-	-	-	-	-	-	X	-
<u>Callionymus sp.</u>	-	-	-	X	-	-	X	-
GOBIIDAE	X	X	X	-	X	-	X	-
GEMPYLIDAE	-	X	-	X	-	-	-	-
NOMEIDAE	-	-	-	X	-	-	-	-
STROMATEIDAE	-	-	-	-	-	-	-	-
<u>Peprilus alepidotus</u>	X	-	-	-	-	-	-	-
<u>Peprilus triacanthus</u>	X	-	-	-	-	-	-	-
SCOPHTHALMIDAE	-	-	-	X	-	-	-	-
<u>Scophthalmus aquosus</u>	X	-	X	X	-	X	X	-
BOTHIDAE	X	X	-	X	-	X	X	-
<u>Bothus ocellatus</u>	X	X	X	X	-	-	X	-
<u>Bothus sp.</u>	X	-	-	X	-	-	X	-
<u>Citharichthys arctifrons</u>	X	-	-	X	-	-	X	-
<u>Citharichthys sp.</u>	X	-	-	-	-	-	X	-
<u>Cyclopsetta fimbriata</u>	X	-	-	-	-	-	-	-
<u>Cyclopsetta sp.</u>	X	-	-	X	-	-	-	-
<u>Etropus microstomus</u>	X	-	-	-	-	-	-	-
<u>Etropus sp.</u>	-	X	-	-	-	-	-	-
<u>Hippoglossina oblonga</u>	X	-	X	-	-	-	X	-
<u>Monolea sp.</u>	-	-	-	X	-	-	-	-
<u>Paralichthys dentatus</u>	-	-	-	X	-	X	X	X
<u>Paralichthys oblongus</u>	X	-	-	-	-	-	-	-
<u>Syacium sp.</u>	-	-	X	X	-	-	-	-
PLEURONECTIDAE	X	-	-	-	X	X	-	-
<u>Glyptocephalus cynoglossus</u>	X	-	-	-	-	X	-	-
<u>Hippoglossoides platessoides</u>	-	-	-	-	-	-	-	X
<u>Limanda ferruginea</u>	-	-	-	-	-	X	X	-
<u>Poecilopsetta sp.</u>	-	-	-	-	-	-	X	-
<u>Scophthalmus aquosus</u>	-	-	-	-	-	X	-	-
CYNOGLOSSIDAE	X	-	-	-	-	-	X	-
<u>Symphurus sp.</u>	X	-	-	-	-	-	-	-
BALISTIDAE	X	-	-	-	-	-	-	-
TETRAODONTIDAE	X	-	-	X	-	-	-	-

Table 2. Relative abundance of larval fishes collected

Delaware II 71-4					Albatross IV 72-9				
Taxon	Average Rank ¹	Dominance ²	Abundance ³	Frequency ⁴	Taxon	Average Rank	Dominance	Abundance	Frequency
Silver hake	5.62	44/122	0.1-384.8 (192.4)	72/122	Atlantic herring	6.12	54/127	0.1-107.2 (53.6)	73/127
Red hake	4.96	17/122	0.1-247.2 (123.6)	59/122	Atlantic cod	4.02	11/127	0.2-35.5 (17.8)	22/127
Atlantic herring	3.74	17/122	0.1-625.3 (312.7)	29/122	Silver hake	3.84	7/127	0.2-5.1 (2.6)	19/127
Windowpane	3.65	1/122	0.1-54.9 (27.5)	33/122	Paralepididae	3.54	7/127	0.1-4.5 (2.3)	11/127
Myctophidae	3.46	10/122	0.1-112.9 (56.5)	22/122	Myctophidae	3.53	3/127	0.2-3.9 (1.5)	12/127
Butterfish	3.36	1/122	0.1-11.9 (6.0)	25/122	Pollock	3.53	4/127	0.3-7.6 (3.8)	12/127
Gulf Stream flounder	3.21	0	0.1-54.7 (27.4)	20/122	Red hake	3.43	0	0.1-0.9 (0.4)	11/127
Albatross IV 71-7					Albatross IV 73-9				
Atlantic herring	2.70	58/148	0.1-76.5 (38.3)	59/148	Atlantic herring	5.34	57/113	0.1-338.4 (169.2)	81/113
Myctophidae	1.75	14/148	0.1-4.4 (2.2)	14/148	Atlantic cod	3.89	14/113	0.1-45.5 (22.8)	45/113
Pollock	1.55	1/148	0.8-10.5 (5.6)	5/148	Myctophidae	3.11	11/113	0.1-10.0 (5.0)	19/113
					Silver hake	3.02	4/113	0.1-6.7 (3.4)	15/113
					Red hake	2.91	0	0.1-2.9 (1.5)	16/113
					Pollock	2.73	4/113	0.1-10.4 (5.2)	7/113

¹Taxa were ranked within each sample on a basis of numbers of individuals. Ranks for each species were averaged over the total samples.

²Proportion of samples in which taxon was among those making up 50% of the individuals.

³Range and median (in parentheses) of number of individuals per 100 m³ in samples in which taxon was found.

⁴Proportion of total samples in which taxon was found.

Albatross IV 74-2					Albatross IV 74-13				
Taxon	Average Rank	Dominance	Abundance	Frequency	Taxon	Average Rank	Dominance	Abundance	Frequency
Northern sand lance	4.42	30/56	0.1-33.2 (16.6)	41/56	Atlantic herring	5.22	57/108	0.1-263.2 (131.6)	76/108
Pollock	3.17	6/56	0.1-57.0 (28.5)	30/56	Pollock	3.46	10/108	0.1-57.0 (28.5)	34/108
Atlantic herring	2.76	5/56	0.1-6.4 (3.2)	30/56	Paralepididae	3.25	12/108	0.2-12.3 (6.2)	21/108
Atlantic cod	2.68	0	0.3-12.3 (6.1)	23/56	Silver hake	3.16	4/108	0.2-5.5 (2.8)	24/108
Haddock	1.96	0	0.1-6.0 (3.0)	13/56	Atlantic cod	3.09	2/108	0.2-28.6 (14.3)	22/108
					Myctophidae	2.82	1/108	0.2-3.4 (1.7)	14/108
Delaware II 74-12					Albatross IV 75-2				
Atlantic herring	4.51	40/56	0.3-380.0 (190.1)	50/56	Northern sand lance	4.16	35/87	0.2-361.8 (181.0)	49/87
Silver hake	2.98	4/56	0.2-27.9 (14.0)	35/56	Pollock	3.69	21/87	0.2-25.6 (12.9)	51/87
Fourbeard rockling	2.84	0	0.2-85.4 (42.8)	26/56	Atlantic herring	2.73	4/87	0.2-32.2 (16.2)	38/87
Red hake	2.62	2/56	0.2-63.9 (32.0)	22/56	Atlantic cod	2.34	0	0.2-8.8 (4.5)	28/87
Witch flounder	2.06	1/56	0.2-3.4 (1.8)	19/56	Haddock	2.08	0	0.2-3.7 (1.9)	27/87

Table 3.— Station data and larval fish

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Vol. Filtered (m ³)	Atl. herring	Red hake	Silver hake	Myctophidae No./100 m ³	Gulf Stream flounder	Butterfish	Windowpane
2	41°-35'	69°-20'	1/X	0747	128	836							
3	41-46	68-30	23/IX	2049	158	1096		2.9	6.7	0.1	0.1	0.3	0.1
4	41-49	68-00	23	2329	62	712		62.1	48.2		0.6		22.9
5	41-50	67-21	24/IX	0228	46	696	20.6	7.3	1.4			0.1	25.9
6	41-52	66-45	24	0510	40	589	625.3						5.6
7	41-57	66-10	24	0807	63	780	0.1						
8	42-00	65-30	24	1226	177	1415							
9	42-30	65-30	24	1500	82	710		1.4	56.2				
10	43-00	65-30	24	1851	98	907			0.2				
11	43-15	65-40	24	2306	40	548		0.2	0.4				
12	43-30	66-12	25/IX	0244	46	574	242.2						
13	43-12	66-00	25	0445	53	718	4.9						
14	43-00	66-00	25	0613	74	660			0.3				
15	42-45	66-00	25	0818	63	625			0.2				
16	43-30	66-00	25	1031	154	1053							
17	42-15	66-00	25	1316	195	1216			0.1				
18	42-00	66-00	25	1430	98	841			0.1				
19	41-45	66-00	25	1613	98	1085	0.1		0.1				
20	41-30	66-00	25	1749	99	1075		0.1					
21	41-15	66-00	25	1920	168	1405				0.3			
22	41-00	66-30	25	2220	122	948		0.2		0.7			
23	41-15	66-30	26/IX	0021	88	792	0.6		0.3				
24	41-30	66-30	26	0212	81	759	86.0						
25	41-45	66-30	26	0355	63	686	7.7						
26	42-00	66-30	26	0606	63	709	0.2						
27	42-15	66-30	26	0812	215	1219			0.2				
28	42-30	66-30	26	1046	191	1261			0.1				
29	42-45	66-30	26	1315	105	780			0.1				
30	43-00	66-30	26	1516	116	1061		0.1	0.1				
31	43-15	66-30	26	1718	53	647							
32	43-30	66-30	26	1909	84	822			0.6				
33	43-46	66-31	26	2116	85	622	143.9						
34	44-00	66-30	26	2316	76	609							
35	44-25	66-30	27/IX	0151	158	1257	0.4						
36	44-25	67-00	27	0425	64	732	2.2						
37	44-00	67-00	27	0650	123	763	17.7						
38	44-25	67-30	27	0925	187	1115							
39	43-25	67-30	27	1135	195	1279							
40	43-00	67-00	27	1424	118	1030							
41	43-00	67-00	27	1547	180	1273							
42	43-30	67-30	27	1814	201	1213							
43	43-15	67-30	27	3030	177	1134							
44	43-15	67-00	27	2258	128	1216			0.1				
45	43-00	67-00	28/IX	0044	175	1355			0.2				
46	42-45	67-00	28	0245	203	1455							
47	42-30	67-00	28	0518	191	1240							
48	42-15	67-00	28	0746	183	1309		0.1	0.3				
49	42-00	67-00	28	0944	41	582	486.1	1.2	1.8				
50	41-45	67-00	28	1127	40	620	76.5	1.0					1.7
51	41-30	67-00	28	1325	46	632	50.8	0.9	12.2				2.4
52	41-15	67-00	28	1512	50	726							2.2
53	41-00	67-00	28	1706	63	708	4.8	0.7	23.7	0.1			
54	40-45	67-00	28	1857	84	856				63.4			
55	40-30	67-00	28	2041	190	1197				112.9			0.3
56	40-30	67-30	28	2332	99	956			1.6	40.3			
57	40-45	67-30	29/IX	0122	78	739			5.8	74.3			
58	41-00	67-30	29	0302	61	663	0.6	0.5	11.6	15.1	0.1		
59	41-15	67-30	29	0453	37	621	27.2	0.6	0.6				0.2
60	41-31	67-30	29	0648	41	635	2.8	0.9					0.8
61	41-45	67-30	29	0838	39	510	3.9	23.5	0.6				17.8
62	41-56	67-30	29	1011	59	665		43.0	6.2				54.9
63	42-15	67-30	29	1224	191	1388		3.0	1.4				15.2

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Vol. Filtered (m ³)	Atl. herring	Red hake	Silver hake	Myctophidae	Gulf Stream flounder	Butterfish	Window-pane
										No./100 m ³			
64	42°-30'	67°-30'	29	1420	209	1533		0.3	0.4				
65	42°-30'	68°-00'	29	1736	178	1135		0.2	0.4				
66	42°-15'	68°-00'	29	1943	125	1259		0.2	0.5				
67	42°-00'	68°-00'	29	2200	146	1225		5.0	21.9	0.2		0.1	0.1
68	41°-50'	68°-30'	29	2336	47	578	1.2	25.6	23.4		0.4	0.2	1.0
70	41°-15'	67°-59'	30/IX	0320	45	521	23.8	0.2	1.0				10.8
71	41°-00'	68°-00'	30	0523	33	584	6.3		384.8		0.2		2.2
72	40°-45'	68°-00'	30	0711	46	756		37.6	110.2	53.0		2.7	0.1
73	40°-30'	68°-00'	30	0849	105	881			2.0	17.9			
74	40°-30'	68°-30'	30	1122	56	700			4.7	11.7			
75	40°-45'	68°-30'	30	1324	40	612	1.0	8.2	139.4				0.5
76	41°-02'	68°-31'	30	1517	35	467		11.4	1.5				4.5
77	41°-15'	68°-30'	30	1637	40	662	0.3	39.6	28.9		0.3	0.3	9.7
78	41°-30'	68°-30'	30	1758	64	752		50.5	25.1	0.1	1.6	2.1	
79	41°-45'	68°-30'	30	1945	125	1309		41.1	42.6			0.5	0.2
80	42°-00'	68°-30'	23/IX	1823	168	1047		0.2	0.9				
81	42°-15'	68°-30'	23	1503	142	1162		0.1					
82	42°-30'	68°-30'	23	1354	212	1421			0.2				
83	42°-30'	69°-00'	23	1115	160	1275							
84	42°-30'	69°-30'	23	0837	192	1352							
85	43°-00'	69°-29'	23	0511	106	1125							
86	43°-30'	69°-30'	23	0203	135	935							
87	43°-30'	70°-00'	22/IX	1228	108	732		0.3					
88	43°-15'	70°-00'	22	1030	113	973							
89	43°-00'	70°-00'	22	0842	104	1042							
90	43°-00'	70°-15'	22	0643	139	1257			1.9				
91	42°-45'	70°-15'	22	0447	109	903							
92	42°-45'	70°-00'	22	0256	158	1427							
93	42°-40'	70°-00'	22	0049	133	1138			0.1				
94	42°-15'	69°-54'	21/IX	2242	111	942		0.1	0.3				
95	42°-00'	69°-00'	30/IX	2306	107	961		0.1	0.3				
96	41°-45'	69°-00'	1/X	0044	161	1131			0.1				
97	41°-30'	69°-00'	1	0943	154	989							
98	41°-15'	69°-00'	1	1142	108	986		4.1	4.5			0.3	0.3
99	41°-00'	69°-00'	1	1654	61	721		26.8	130.5				0.6
100	40°-45'	69°-00'	1	2327	61	697		7.0	25.5	8.6	0.6		
101	40°-30'	69°-00'	2/X	0103	62	867		146.4	263.7	15.6	0.2		1.5
102	40°-15'	69°-00'	2	0247	76	799		0.6	104.6	37.3			
103	40°-15'	69°-30'	2	0501	59	665			9.2		0.8	0.3	
104	40°-30'	69°-30'	2	0644	55	660	0.2	12.9	75.8	0.2		0.8	0.5
105	40°-47'	69°-26'	1/X	2109	40	627		40.3	52.8		22.5	10.7	6.1
106	40°-55'	69°-32'	1	1950	40	603		138.8	0.3			3.3	2.7
107	41°-15'	69°-25'	1	1423	38	589		3.2	0.2				
108	41°-32'	69°-30'	1	0630	37	704							
109	41°-45'	69°-30'	1	0220	142	1240			0.1				
110	41°-35'	69°-40'	1	0512	35	566							
113	40°-40'	70°-00'	2/X	0913	41	690		10.7	23.0		5.4	0.2	
114	40°-30'	70°-00'	2	1027	47	671		247.2	95.1		16.7	11.9	0.3
115	40°-15'	70°-00'	2	1222	84	887		18.0	23.3		0.5		0.1
116	40°-00'	70°-00'	2	1530	151	1256		14.8	2.0	1.1	0.2	2.5	0.1
117	40°-00'	70°-30'	2	1708	174	1221	0.2	1.2		2.0	0.8		
118	40°-00'	71°-00'	2	1903	232	1155				24.7	0.3		
119	40°-30'	71°-00'	3/X	0040	46	659		90.1	13.6		5.6	1.1	
120	40°-30'	70°-30'	3	0314	55	635		5.7	6.5		1.7	0.6	
121	40°-45'	70°-30'	3	0502	58	658		82.1	96.7	0.2	3.8	1.7	
122	40°-45'	71°-00'	3	0739	42	777		79.8	112.7		54.7	3.1	
123	41°-00'	71°-00'	3	0937	32	550		5.8	2.4			0.2	
124	41°-00'	70°-48'	3	1219	34	359		1.4				0.3	0.6
125	41°-12'	70°-40'	3	1328	25	396		10.9				2.0	0.3
126	41°-15'	71°-04'	3	1513	35	518		0.2				0.2	

Table 4. Station data and larval fish

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Vol. Filtered (m ³)	Atl. herring	Pollock	Myctophidae
								No./100 m ³	
1	43°-00'	65°-30'	3/XII	1936	98	440	0.5		
2	42 -45	65 -30	3	2129	85	461			
3	42 -30	65 -30	3	2315	78	336			
4	42 -15	65 -29	4/XII	0142	100	215			
5	42 -00	65 -30	4	0336	175	1052			4.4
6	41 -45	65 -30	4	0541	175	925			1.3
7	41 -30	65 -30	4	0740	180	940			
8	41 -15	65 -30	4	0955	224	979			0.3
9	41 -00	65 -30	4	1410	234	1072			0.3
10	40 -45	66 -00	4	2110	170	1165			0.5
11	41 -00	66 -00	4	2310	175	1060			0.1
12	41 -15	66 -00	5/XII	0131	175	1052			0.6
13	41 -30	66 -00	5	0410	170	785			
14	41 -45	66 -00	5	0940	76	315			
15	42 -00	66 -00	5	1150	73	453			
16	42 -15	66 -00	5	1350	150	1045			
17	42 -30	66 -00	5	1617	112	522			
18	42 -45	66 -00	5	1950	48	212			
19	43 -00	66 -00	5	2125	110	475			
21	42 -30	66 -12	6/XII	0045	55	166	9.0		
22	43 -45	66 -16	6	0212	45	253	38.3		
23	44 -00	66 -30	6	0350	50	256	50.0		
24	43 -45	66 -30	6	0508	72	207	39.6		
25	43 -25	66 -30	6	0630	67	360	0.6		
26	43 -15	66 -30	6	0750	45	245			
27	43 -00	66 -30	6	0915	90	522			
28	42 -45	66 -30	6	1100	93	525			
29	42 -30	66 -30	6	1248	175	950			
30	42 -15	66 -30	6	1441	175	1014	0.1		
31	42 -00	66 -30	6	1627	65	244	0.4		
32	41 -45	66 -30	6	1738	60	237	0.8		
33	41 -30	66 -30	6	1850	60	319	3.4		
34	41 -15	66 -30	6	2019	68	318	0.3		
35	41 -00	66 -32	6	2138	68	338			
36	40 -45	66 -30	6	2300	160	1203			2.1
37	40 -30	66 -30	7/XII	0106	93	997			1.3
38	40 -15	67 -00	7	0340	95	958			2.8
39	40 -30	67 -00	7	0526	112	1248			0.5
40	40 -45	67 -00	7	0730	85	378			0.8
41	41 -00	67 -00	7	0920	50	224	0.9		
42	41 -15	67 -00	7	1055	50	234	2.6		
43	41 -30	67 -00	7	1340	50	182	19.2		
44	41 -45	67 -00	7	1500	45	192	22.4		
45	42 -00	67 -00	7	1634	50	184	58.2		
46	42 -15	67 -00	7	1855	194	1203			
47	42 -30	67 -00	7	2115	204	1153			
48	42 -45	67 -00	7	2330	204	1207			
49	43 -00	67 -00	8/XII	0123	132	773			
50	43 -15	67 -00	8	0302	162	933			
51	43 -30	67 -00	8	0453	196	1075			
52	43 -45	67 -00	8	0715	153	941			
53	44 -00	67 -00	8	0840	128	933			
54	44 -15	66 -56	8	1022	160	885			
55	44 -15	66 -30	8	1218	41	248	0.4		
56	44 -30	66 -15	8	1340	120	506			
57	44 -30	66 -30	8	1458	130	795			
58	44 -30	67 -00	8	1705	114	374			
59	44 -26	67 -30	8	1850	53	224			
60	44 -15	67 -30	8	2010	143	952			
61	44 -00	67 -30	8	2205	175	1040			
63	43 -30	67 -30	9/XII	0116	214	1140			
65	43 -00	67 -30	9	0422	258	846	0.4		
67	42 -30	67 -30	9	0725	258	1196	0.1		
68	42 -15	67 -30	9	0910	196	1209			
69	41 -56	67 -30	9	1130	18	115	1.7		
70	41 -45	67 -30	9	1253	38	183	7.7		
71	41 -30	67 -30	9	1427	33	130	19.2		
72	41 -15	67 -25	9	1600	43	225	47.6		
73	41 -00	67 -30	9	1717	45	220	2.7		
74	40 -45	67 -30	9	1843	55	329			
75	40 -30	67 -30	9	2010	97	568			
76	40 -15	67 -30	9	2135	224	1123			1.3
78	40 -15	68 -00	10/XII	0007	214	1125			

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Vol. Filtered (m ³)	Atl. herring	No./100 m ³	
								Pollock	Myctophidae
79	40 °-30'	68 °-00'	10	0203	100	476			
80	40 °-45'	68 °-00'	10	0325	60	254	7.5		
81	41 °-00'	68 °-00'	10	0441	50	203	4.9		
82	41 °-15'	68 °-00'	10	0600	46	272	68.8		
83	41 °-30'	67 °-55'	10	0750	41	146	18.5		
84	41 °-45'	68 °-00'	10	0950	18	93	3.2		
85	42 °-00'	68 °-00'	10	1114	165	1111			
86	42 °-15'	68 °-00'	10	1253	152	869			
87	42 °-30'	68 °-00'	10	1422	152	1017			
88	43 °-00'	68 °-00'	10	1712	162	691			
89	43 °-30'	68 °-00'	10	2010	204	1116			
90	44 °-00'	68 °-00'	10	2320	90	696			
91	44 °-15'	68 °-00'	11/XII	0031	46	264	1.9		
92	44 °-00'	68 °-30'	11	0302	46	303	2.0		
93	43 °-30'	68 °-30'	11	0545	153	918			
94	43 °-00'	68 °-30'	11	0850	175	755			
95	42 °-30'	68 °-30'	11	1220	175	831			
96	42 °-15'	68 °-30'	11	1413	160	563			
97	42 °-00'	68 °-30'	11	1604	158	612			
98	41 °-45'	68 °-30'	11	1820	84	351			
99	41 °-30'	68 °-30'	11	2010	114	278	25.1		
100	41 °-15'	68 °-30'	11	2135	38	231	5.2		
101	41 °-00'	68 °-30'	11	2320	38	206	6.8		
102	40 °-45'	68 °-30'	12/XII	0045	43	244	66.0		
103	40 °-30'	68 °-30'	12	0205	55	277	1.1		
104	40 °-15'	68 °-30'	12	0352	170	966			
105	40 °-00'	68 °-30'	12	0535	175	992			
106	40 °-15'	69 °-00'	12	0935	125	787			
107	40 °-30'	69 °-00'	12	1130	47	287	1.4		
108	40 °-45'	69 °-00'	12	1300	47	265	24.5		
109	41 °-00'	69 °-00'	12	1417	55	338	10.4	0.8	
110	41 °-15'	69 °-00'	12	1530	108	615	4.6	2.1	
111	41 °-30'	69 °-00'	12	1655	120	533	0.6		
112	41 °-45'	69 °-00'	12	1830	174	565			
113	42 °-00'	69 °-00'	12	2000	174	828			
114	42 °-30'	69 °-00'	12	2333	204	1002			
115	43 °-00'	69 °-00'	13/XII	0325	100	398			
116	43 °-30'	69 °-00'	13	0605	90	514			
117	43 °-45'	69 °-00'	13	0750	80	296	0.3		
118	43 °-45'	69 °-30'	13	0950	53	241	2.5		
119	43 °-30'	69 °-30'	13	1115	125	422			
120	43 °-15'	69 °-30'	13	1305	92	607			
121	43 °-00'	69 °-30'	13	1450	120	588			
122	42 °-45'	69 °-30'	13	2135	175	747			
123	42 °-30'	69 °-30'	14/XII	0025	153	1096			
124	42 °-15'	69 °-30'	14	0238	170	905			
125	42 °-30'	70 °-00'	14	0533	170	617			
126	42 °-45'	70 °-00'	14	0720	152	680			
127	43 °-00'	70 °-00'	14	0905	83	413			
128	43 °-15'	70 °-00'	14	1149	85	607			
129	43 °-30'	70 °-00'	14	1733	80	323	0.3		
130	43 °-15'	70 °-25'	14	2005	46	221	1.8		
131	43 °-00'	70 °-30'	14	2205	33	158	3.2		
132	42 °-45'	70 °-30'	14	2338	53	244	1.2		
133	42 °-30'	70 °-30'	15/XII	0128	28	147			
134	42 °-15'	70 °-30'	15	0255	60	272	0.4		
136	42 °-15'	70 °-00'	15	0537	85	382			
137	42 °-00'	69 °-57'	15	0740	12	80	1.3		
138	42 °-00'	69 °-45'	15	0845	130	472			
139	42 °-00'	69 °-30'	15	1015	175	824			
140	41 °-45'	69 °-30'	15	1221	138	652			
141	41 °-45'	69 °-45'	15	1400	83	283	0.4		
142	41 °-30'	69 °-35'	15	1615	33	247			
143	41 °-15'	69 °-25'	15	1850	23	112			
144	40 °-54'	69 °-14'	15	2225	50	239	18.4		
145	40 °-30'	69 °-30'	16/XII	0252	47	305	1.3		
147	40 °-00'	69 °-30'	16	1050	85	447			
148	39 °-47'	69 °-35'	16	1320	170	1177			
151	40 °-11'	69 °-54'	16	0800	75	346	4.3		0.1
152	40 °-05'	69 °-57'	16	1705	47	289	4.5		
153	40 °-23'	70 °-07'	16	1900	53	219	6.4	3.1	
154	40 °-34'	70 °-20'	16	2100	47	183	76.5	10.5	
155	40 °-48'	70 °-31'	16	2300	33	174	13.8	1.1	
156	40 °-58'	70 °-40'	17/XII	0102	38	217	10.1		
157	41 °-12'	70 °-53'	17	0302	30	230	2.2		

Table 5. Station data and larval fish

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Vol. Filtered (m ³)	Atl. herring	Atl. cod	Pollock	Silver hake	Red hake	Myctophidae	Para-lepididae
										No./100 m ³			
1	41°-14'	70°-59'	28/XI	1748	15	125	2.4						
2	41 -10	70 -40	28	1954	21	126	7.1			1.6			
3	41 -00	70 -40	28	2121	27	159	3.1			0.6			
4	41 -00	71 -00	28	2324	37	289	3.1		1.4	1.7		0.4	
5	41 -00	71 -30	29/XI	0259	48	294				2.0	0.3		
6	40 -45	71 -00	29	0529	45	263				1.5			
7	40 -30	71 -01	29	0712	53	356	0.6			5.1		0.3	0.3
8	40 -15	71 -30	29	1125	58	399				1.8	0.5		
9	39 -59	70 -59	29	1430	85	675	0.2				0.2	0.2	
10	40 -00	70 -30	29	1817	103	661						0.5	0.2
11	40 -15	70 -29	29	2022	106	679	0.6			0.2		0.2	
12	40 -15	70 -00	2/XII	2000	82	524	1.2			0.6		0.2	
13	40 -00	70 -01	2	2141	114	559				0.2			
14	40 -15	69 -31	3/XII	0120	65	417	1.7		3.6	1.9			
15	40 -15	69 -01	3	0350	84	670							
16	40 -30	69 -00	3	0633	60	379	0.5		5.0				
17	40 -29	69 -31	3	0900	47	345	0.9			2.3			
18	40 -29	70 -00	2/XII	1733	59	368	7.6		2.2	3.3			
19	40 -31	70 -31	29/XI	2208	56	313	2.6	2.2					
20	40 -46	70 -32	30/XI	0005	40	243	3.3	0.8		2.1	0.4		
21	40 -40	70 -00	2/XII	1546	35	231	33.8			0.9	0.9		
22	40 -55	69 -40	3/XII	1153	25	151	35.8						
23	40 -46	69 -32	3	1319	32	167	24.6	7.2	2.4		0.6		
24	40 -45	69 -00	3	1644	50	351	23.9	3.7		0.3			
25	41 -00	69 -00	3	1923	68	445	107.2						
26	41 -00	69 -16	3	2051	43	268	17.9	0.8					
27	41 -15	69 -21	3	2221	48	225	2.7						
28	41 -14	69 -01	4/XII	0003	95	674	2.4		0.3				
29	41 -29	69 -01	4	0241	105	684	0.9						
30	41 -30	69 -22	4	0448	57	393	0.3						
31	41 -44	69 -30	4	0619	101	686	0.3						
32	41 -44	69 -00	4	0852	106	670							
33	41 -59	68 -59	4	1125	95	714							
34	42 -15	69 -31	4	1432	102	682							
35	41 -55	69 -51	4	1747	53	392	3.7		1.0				
36	42 -15	70 -00	4	1948	88	733	1.1		0.3				
37	42 -30	70 -00	4	2217	117	629	0.2						
38	42 -44	70 -01	5/XII	0114	112	660							
39	42 -45	70 -15	5	0402	87	604	0.5						
40	42 -59	70 -15	5	1510	103	550	1.1						
41	43 -00	70 -00	5	1757	106	685							
42	43 -14	70 -00	5	1953	91	742	1.1						
43	43 -30	70 -00	5	2208	84	477	3.6						
44	43 -29	69 -32	6	0026	95	695	0.4						
44A	43 -15	68 -46	9/XII	0007	95	670							
45	43 -01	69 -30	6/XII	0327	97	648							
46	42 -30	69 -30	6	0645	101	770							
47	42 -32	68 -30	6	1108	101	679							
48	42 -16	68 -30	6	1247	108	631							
49	42 -01	68 -30	6	1438	95	700	0.3						
50	41 -46	68 -30	6/XII	1618	95	754	1.2						
51	41 -30	68 -30	6	1831	92	612	1.8			0.2			
52	41 -15	68 -31	6	2100	36	280	6.4		2.5				
53	41 -00	68 -30	6	2310	37	260	9.2	2.7		0.4	0.4		
54	40 -46	68 -29	7/XII	0127	38	212	0.9	5.2					
55	40 -30	68 -30	7	1813	40	228		0.9		0.9			
56	40 -15	68 -30	7	2007	92	762							
57	40 -15	68 -01	7	2231	90	779							
58	40 -29	68 -00	8/XII	0103	103	733					0.8		0.1
59	40 -42	68 -00	8	0234	60	432		6.9					0.3
60	41 -00	68 -00	8	0520	33	246		16.7					
61	41 -15	68 -00	8	0649	18	120	4.1	24.2					
62	41 -28	68 -09	8	0830	31	211	12.3	35.5					
63	41 -50	68 -01	8	1052	28	191		0.5	0.5				

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Vol. Filtered (m ³)	Atl. herring	Atl. cod	Pollock	No./100 m ³			Para lepididae
										Silver hake	Red hake	Myctophidae	
64	42°-00	68°-00	8	1218	100	732	0.3						
65	42 -14	68 -02	8	1403	95	749	0.1						
66	42 -30	68 -00	8	1643	97	720	0.1						
67	42 -45	68 -00	8	1833	102	783	0.1						
68	42 -45	67 -30	10/XII	0224	93	690							
69	42 -30	67 -30	10	0414	100	759							
70	42 -15	67 -30	10	0603	95	710							
71	42 -00	67 -35	10	0746	31	209							
72	41 -44	67 -30	10	1009	27	190	1.1	6.8					
73	41 -31	67 -30	10	1153	25	194	2.1	30.9					
74	41 -16	67 -21	10	1330	30	183	13.1	27.3					
75	41 -02	67 -30	10	1501	52	412	2.9	3.6			0.2		
76	40 -45	67 -30	10	1636	77	556	0.4	9.7					
77	40 -30	67 -30	10	1806	95	791	0.1						0.8
78	40 -31	67 -00	10	2047	97	882					0.5		0.7
79	40 -45	67 -01	10	2353	87	645					0.9		4.5
80	40 -59	66 -58	11/XII	0139	66	526	1.1	1.3					
81	40 -15	67 -00	11	0409	52	434	1.6				0.2		
82	41 -29	66 -58	11	0920	53	367	25.3		7.6				
83	41 -45	67 -01	11	1130	55	364	8.5	6.0					
84	41 -59	66 -59	11	1348	43	330	4.8	3.0			0.3		
85	42 -15	67 -00	11	1605	100	689							
86	42 -29	67 -00	11	1826	103	739							
87	42 -30	66 -30	11	2146	104	708	0.1						
88	42 -15	66 -30	11	2326	88	650							
89	42 -00	66 -30	12/XII	0113	70	501	0.2						
90	41 -44	66 -30	12	0332	60	435	2.8						
91	41 -30	66 -30	12	0512	80	590	0.3		0.3				
92	41 -15	66 -30	12	0648	76	530	0.2						
93	41 -00	66 -31	12	0830	48	397					0.3		1.5
94	41 -14	60 -05	12	1109	106	751	0.1				0.1	0.7	3.1
95	41 -29	66 -00	12	1337	90	688							
96	41 -43	66 -00	12	1512	86	757	0.3						
97	42 -00	65 -30	12	1824	114	559					2.9		0.2
98	42 -00	66 -00	12	2104	68	500							
99	42 -13	66 -00	12	2220	93	784							0.3
100	42 -51	66 -30	15/XII	1807	98	696							
101	42 -28	66 -00	13/XII	0028	101	696							
102	42 -43	66 -00	13	0207	51	368							
103	42 -45	66 -30	13	0519	119	619							
104	42 -45	67 -00	13	0748	90	671							
105	43 -01	66 -58	13	0955	118	773							
105A	43 -15	67 -45	9/XII	2245	91	642							
106	43 -19	67 -00	14/XII	0310	97	725							
107	43 -29	67 -00	14	0503	102	806	0.1						
107A	43 -45	67 -45	9/XII	1853	119	735							
108	43 -45	67 -00	14/XII	0720	87	645							
109	43 -57	67 -00	14	0857	99	737							
110	44 -19	67 -29	14	1233	86	771							
111	44 -19	66 -59	14	1450	101	779							
112	44 -20	66 -40	14	1632	97	783	1.3						
113	44 -00	66 -30	14	1835	55	412	2.2						
114	43 -45	66 -30	14	1956	73	594	23.1						
115	43 -30	66 -30	14	2130	87	531	1.9	0.2					
116	43 -29	66 -17	14	2253	62	470	5.5						
117	43 -14	66 -30	15/XII	0044	68	532	7.5						
118	42 -59	66 -29	15	0249	97	720							
119	43 -00	66 -01	15	0529	93	726	1.7						
120	43 -10	66 -00	15	0645	77	499	1.0						
121	43 -14	65 -33	15	0915	33	235	1.3						
122	43 -00	65 -30	15	1648	97	771							
123	43 -10	65 -01	15	1415	106	785							
124	43 -29	65 -01	15	1205	92	722							

Table 6.— Station data and larval fish

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Atl. herring	Atl. cod	No./100 m ³			
									Silver hake	pollock	Red hake	Myctophidae
1	41°-15'	71°-00'	4/XII	1225	28	202	2.0				1.0	
2	41 -15	70 -40	4	1426	14	102	2.9	13.7			2.9	
3	41 -00	70 -40	4	1649	41	231	2.2			1.3		
4	41 -00	71 -00	4	1831	35	239		0.7		0.8		
5	40 -59	71 -28	4	2130	35	239	0.4	0.4				0.4
6	40 -45	71 -00	5/XII	0010	54	345	5.5			0.3		0.3
7	40 -29	71 -01	5	0245	71	496	8.5	1.0		6.7		0.4
8	40 -15	71 -30	5	0530	77	501	4.0			5.4		1.2
9	40 -01	71 -00	5	1017	95	744	0.1					0.3
9A	39 -45	71 -00	5	1205	109	814	0.1	0.1		0.2		0.5
9B	39 -45	70 -30	5	1540	113	801	2.8	0.6		3.1		0.4
10	40 -00	70 -30	5	1840	122	915	1.1	0.1		3.2		0.1
11	40 -14	70 -30	5	2120	80	543	0.9			0.2		1.1
12	40 -15	70 -00	6/XII	0105	95	710	0.6			0.1		
13	40 -00	70 -00	6	0620	92	736	0.3					2.4
13A	39 -45	69 -59	6	1103	98	735	0.9				0.1	2.7
13B	39 -45	69 -30	6	1917	100	750						1.7
13C	39 -59	69 -30	6	2100	93	695	0.9				0.1	0.7
14	40 -13	69 -30	6	2250	74	545	0.6	0.2				
14A	40 -00	69 -00	7/XII	0149	100	807	2.5	0.4			0.1	0.7
15	40 -15	69 -00	7	0442	107	727	1.1	0.1		0.3		0.1
16	40 -30	69 -00	7	0632	68	520	33.1			0.2		
17	40 -29	69 -30	7	0942	68	558	5.7					
19	40 -30	70 -30	7	1439	62	425	21.2	8.5		1.2		0.2
20	40 -45	70 -30	7	1621	53	350	21.4			0.6		0.6
21	40 -45	70 -00	7	1847	30	204	81.9	7.8				
22	40 -53	69 -39	7	2100	30	216	0.5			2.8		
23	40 -45	69 -30	7	2215	47	335	129.5	2.1				
24	40 -45	69 -00	8/XII	0143	56	385	113.5	0.5		0.5		
25	41 -01	69 -01	8	0401	80	532	30.6					
26	41 -01	69 -15	8	0558	60	344	27.3	2.9				
27	41 -15	69 -25	8	0758	35	249	0.8	0.4				
28	41 -15	69 -01	8	1025	95	765	1.4					
29	41 -30	69 -00	8	1246	102	756	0.9					
30	41 -30	69 -25	8	1534	57	330	1.2					
31	41 -45	69 -30	8	1743	105	800	0.1	0.1		0.1		
32	41 -45	69 -00	11/XII	0835	63	460	7.6					
33	41 -59	68 -59	11	0600	101	752	0.3					
34	42 -15	69 -30	10/XII	1445	104	818	0.4	0.5				
35	41 -55	69 -30	8/XII	1946	73	427	0.9	0.9			8.2	
36	42 -15	69 -59	8	1135	95	742		0.4				
37	42 -30	70 -00	20/XII	0636	110	793	0.1					
37A	42 -30	70 -15	20	0805	83	615	0.3	1.3				
37B	42 -15	70 -30	20	1030	65	439					2.5	
37C	42 -00	70 -26	20	1238	35	251	2.0				10.4	0.4
37D	41 -55	70 -21	20	1336	22	175	2.3	37.1				0.6
38	42 -45	70 -00	20	0442	107	739	0.1					
39	42 -45	70 -15	20	0317	42	330					2.1	
40	43 -00	70 -15	20	0136	100	762						
41	43 -00	70 -00	20	0005	101	776	0.1	0.3			0.2	
45	43 -00	69 -30	19/XII	2120	110	753						
46	42 -30	69 -30	10/XII	1740	116	752	0.4					
47	42 -30	68 -30	10	2243	86	640	0.2					
48	42 -15	68 -30	11/XII	0036	95	710	0.1					
49	42 -00	68 -30	11	0328	99	826	0.1					

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Atl. herring	Atl. cod	Silver hake	Pollock	Red hake	Myctophidae
									No./100 m ³			
50	41°-45	68°-30	11	1135	107	805	8.0				0.3	
51	41 -30	68 -30	11	1432	102	590	24.2	0.2				
52	41 -15	68 -30	11	1600	48	341	4.7	1.5				
53	41 -00	68 -30	11	1730	38	206	75.7					
54	40 -45	68 -30	11	1920	42	307	310.4	0.3				
55	40 -30	68 -29	11	2105	98	770	0.3	0.1				0.3
56	40 -15	68 -30	12/XII	0028	103	775						0.5
56A	40 -00	68 -30	12	0300	120	895	0.1					1.7
57	40 -15	68 -00	12	0655	110	909						0.2
58	40 -29	68 -00	12	0905	89	660	0.3					
59	40 -45	68 -00	12	1304	62	510	1.8	0.2				0.2
60	41 -00	68 -00	12	1520	48	380	55.0					
61	41 -14	68 -00	12	1744	26	145	91.8	45.5				
62	41 -24	68 -04	12	1917	32	256	49.6	39.1				
63	41 -49	68 -02	12	2220	54	457	0.7	0.2				
64	42 -00	68 -00	13/XII	0006	106	827	0.2					
65	42 -15	68 -00	13	0228	104	766	0.3					
66	42 -30	68 -00	13	0419	104	738						
67	42 -46	68 -00	13	0715	102	770						
68	42 -45	67 -30	13	0936	95	710						
69	42 -30	67 -30	13	1230	101	765	0.1					
70	42 -15	67 -30	13	1420	100	786						
71	42 -00	67 -35	13	1610	35	239	0.4					
72	41 -45	67 -30	13	1754	42	293	28.7	28.7				
73	41 -30	67 -30	13	1920	43	339	57.8	15.9				
74	41 -15	67 -32	13	2125	40	294	338.4					
75	41 -06	67 -30	14/XII	0012	55	408	4.2	0.5				
76	40 -45	67 -30	14	0224	80	625	1.3					0.2
77	40 -30	67 -30	14	0442	99	740	0.3					
77A	40 -15	67 -30	14	2030	102	771					0.3	2.1
78	40 -30	67 -00	15/XII	0058	117	885					0.2	2.0
79	40 -45	67 -01	15	0311	102	715						0.1
80	40 -59	67 -00	15	0521	72	592	1.5	1.7				0.2
81	41 -15	67 -01	15	0745	69	404	14.6	5.2				
82	41 -30	67 -00	15	0935	67	463	45.6	0.9				
83	41 -45	67 -00	15	1348	32	215	107.0	10.7				
84	42 -00	66 -59	15	1538	48	340	28.8	32.4				
85	42 -16	66 -59	15	1847	97	725	0.1					
86	42 -29	66 -59	15	2110	116	870						
87	42 -30	66 -30	16/XII	0558	104	805	0.3					
88	42 -16	66 -30	16	0745	114	719						
89	42 -01	66 -30	16	0942	84	613	8.2	5.7				
90	41 -45	66 -30	16	1116	83	659	5.5	0.5				
91	41 -30	66 -30	16	1335	73	594	2.9	15.7				
92	41 -15	66 -31	16	1613	83	598	1.2	7.5				
93	41 -00	66 -30	16/XII	1830	107	757						
93A	40 -45	66 -30	16	2055	86	730						10.0
93B	41 -00	66 -00	17/XII	0122	113	759		0.1			0.1	3.3
94	41 -15	66 -00	17	0411	100	810						1.1
94A	41 -30	65 -30	17	0830	120	910						
95	41 -30	66 -00	17	1311	112	813	0.1	0.4				
96	41 -45	66 -00	18/XII	0103	82	605	6.0					
97	42 -00	65 -30	18	0535	97	759						
98	42 -00	66 -00	18	2316	105	819		0.1				
99	42 -15	66 -01	19/XII	0210	123	930	1.2					
101	42 -30	66 -00	19	0502	123	827	0.1					
103	42 -45	66 -30	16/XII	0315	95	798						
104	42 -46	67 -00	16	0009	97	812						

Table 7.— Station data and larval fish abundance, *Albatross IV* Cruise 74-2.

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Atl. herring	Northern sand lance	Pollock	Atl. cod	Haddock
3	41°-00'	70°-40'	11/II	1930	32	208		33.2	No./100 m ³	2.4	
4	41 -00	71 -00	22/II	0437	41	247	0.8	4.9		3.6	
6	40 -45	71 -00	22	0305	48	353	0.8	10.5	39.9	2.5	1.1
16	40 -30	69 -00	21/II	1555	63	448		1.1	0.2		0.7
17	40 -30	69 -30	21	1906	53	342	0.3	14.6	0.9	12.3	
18	40 -30	70 -02	21	2129	55	400		1.0	7.5	8.3	5.0
19	40 -30	70 -30	22/II	0011	65	435		9.7	16.6	7.4	6.0
20	40 -45	70 -30	11/II	2120	43	291	3.8	6.9	57.0	2.4	0.3
21	40 -45	70 -00	12/II	0040	25	160	2.5	13.1	0.7		
22	40 -55	69 -38	12	0250	25	227	3.1	4.0	5.3		
23	40 -45	69 -30	12	0435	33	274		0.4	6.9		
24	40 -44	69 -00	12	0714	63	461	0.2	0.4	1.1		0.2
25	41 -00	69 -00	12	1058	85	630		13.8	6.8	0.8	0.2
26	41 -00	69 -16	12	1350	47	376		7.5	0.5		
27	41 -12	69 -24	12	1540	37	275		1.1			
28	41 -15	69 -00	12	1745	104	780	0.4	0.3	0.1		
29	41 -31	69 -01	12	2001	100	791	0.1	0.9	0.1		
30	41 -31	69 -25	12	2225	60	434			0.2		
32	41 -45	69 -00	13/II	0100	112	759					
49	42 -00	68 -32	13	0405	99	788	0.4				
50	41 -45	68 -29	13	0633	110	724	0.4				
51	41 -30	68 -30	13	0829	83	680	1.3	8.5	1.2		0.2
52	41 -15	68 -30	13	1008	50	441	0.2	3.9	0.7		0.9
53	41 -00	68 -30	13	1307	37	194	0.5	3.6		1.0	
54	40 -46	68 -30	13	1537	54	348	5.1	2.0			
55	40 -30	68 -30	13	1900	84	622		1.3	0.8		0.5
56	40 -15	68 -30	13	2103	98	789		0.4			
58	40 -30	68 -00	14/II	0042	97	753		0.1	0.1		0.1
59	40 -44	68 -00	14	0229	88	650	4.2	9.5		0.8	
60	41 -00	68 -00	14	0407	50	293					
61	41 -15	68 -00	14	0711	25	223	4.5	14.8		5.2	
62	41 -24	68 -02	14	1004	35	221	1.4	26.2	8.1	8.6	
63	41 -45	68 -00	15/II	0200	27	225	0.4	2.2	0.9		
64	42 -00	68 -00	15	0315	106	745					
70	42 -16	67 -30	15	0630	120	900					
71	42 -01	67 -30	15	0818	35	234	2.6	2.6	1.7		
72	41 -45	67 -30	15	1035	40	236	0.8	19.1	3.8	1.3	
73	41 -30	67 -30	15	1221	29	248	2.8	12.9	1.2	4.0	
74	41 -16	67 -31	15	1419	35	249	3.2	16.9		3.6	
75	41 -00	67 -29	15	1716	59	472	6.4	12.7		1.3	
76	40 -45	67 -30	15	2040	80	556	1.3	4.9		1.6	0.7
80	41 -00	67 -00	16/II	0011	72	479		2.7		2.9	0.6
81	41 -14	67 -00	16	0211	67	402	6.0	8.7	1.2	0.3	
83	41 -44	67 -00	16	0800	53	322		3.4	0.3	1.6	
84	42 -00	67 -00	16	1023	55	345	0.6	9.9	4.9	1.7	
85	42 -15	67 -00	16	1229	104	771	0.5				
88	42 -15	66 -25	16	1703	104	699		0.6			
89	42 -01	66 -31	16	1900	73	530	0.2	1.7	0.4		
90	41 -45	66 -30	16	2048	70	500	0.2	2.2	0.8	0.4	
91	41 -30	66 -30	16	2245	80	549			0.6	0.4	

Table 8.— Station data and larval fish abundance, Delaware II Cruise 74-12.

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Atl. herring	Fourbeard rockling	Red hake No./100 m ³	Silver hake	Witch fld.
2	42°-13'	70°-14'	12/X	2236	29	206	3.9	1.5	1.0	6.5	0.5
3	42 -10	70 -27	12	2126	35	205	0.5	85.4	63.9	27.9	3.4
4	42 -15	70 -36	12	2031	45	281	0.4		1.4	0.7	
5A	42 -28	70 -23	12	1640	77	339	55.8	19.5	6.2	9.7	
5	42 -23	70 -19	8/X	--	29	149	38.3	40.3	22.8	4.7	1.3
6	42 -20	70 -30	12/X	1733	67	362	0.6	3.3	4.4	0.6	0.6
7	42 -27	70 -44	12	2003	55	412	1.9	3.6	6.1	0.7	1.7
8	42 -32	70 -37	12	1840	65	359	3.1	1.7	8.9	1.4	
9A	42 -35	70 -25	12	1507	107	428	12.4	0.5	0.2	0.7	
9	42 -41	70 -24	11/X	1134	45	233	67.4	0.4	0.9		0.4
10	42 -44	70 -23	11	1041	85	429	2.3		0.9		
11	42 -47	70 -19	8/X	2125	110	645	5.9		1.7		0.2
12	42 -49	70 -23	11/X	0947	113	549	34.2		0.2	0.2	
13	42 -52	70 -29	11	0855	110	634				0.5	
14	42 -52	70 -34	11	0800	88	481			0.2	0.4	0.8
15	42 -51	70 -41	11	0709	59	342	0.3	1.8		6.4	1.5
16	43 -00	70 -20	8/X	2300	103	413					
17	43 -04	70 -33	11/X	0530	40	343	0.3		3.8	7.6	0.3
18	43 -11	70 -16	9/X	0025	100	435	0.7	0.5		0.2	
19	43 -10	70 -24	11/X	0410	85	500	4.6		0.4	10.4	0.6
20	43 -21	70 -22	11	0246	51	278	14.0	4.7	1.1	1.4	1.1
21	43 -20	70 -16	11	0202	70	320	8.4		1.3	0.3	0.3
22	43 -19	70 -06	9/X	0202	104	618	1.0				
23	43 -25	70 -15	11/X	0115	65	380	62.9		5.5	7.4	0.8
24	43 -30	70 -07	11	0009	40	236	16.5	1.3		0.4	
25	43 -26	69 -53	9/X	0345	120	703					
26	43 -31	69 -57	10/X	2302	95	556	0.4	0.2			
27	43 -39	69 -59	10	2201	59	350	131.1	6.3		2.6	
28	43 -30	69 -39	9/X	0512	94	558	3.2	0.4		0.2	
29	43 -39	69 -44	10/X	2044	50	356	30.3	4.5		0.8	
30	43 -46	69 -42	10	1950	53	411	8.3	5.1	0.5	0.2	
31	43 -48	69 -29	10	1817	82	478	16.1	7.3	4.2	1.7	0.8
32	43 -43	69 -25	10	1722	90	417	9.1	1.4		0.5	
33	43 -37	69 -22	9/X	0710	109	583	11.8	0.3		0.2	
34	43 -39	69 -07	10/X	1336	115	456	3.7	0.4		0.2	
35	43 -46	69 -06	10	1428	90	402	22.4			0.3	
36	43 -50	69 -07	10	1330	75	407	9.8	1.7	0.5		
37	43 -45	68 -50	9/X	0955	83	607	57.7	0.3		0.8	0.3
39	43 -57	68 -42	10/X	0921	65	444	14.6			0.5	0.2
40	43 -51	68 -38	10	1043	106	620	11.3	0.8			0.3
41	43 -46	68 -37	9/X	1130	92	540	5.4			0.6	
42	43 -53	68 -22	9	1310	86	501	4.0				
43	43 -59	68 -26	10/X	0826	95	493	80.1		0.2		
44	44 -04	68 -24	10	0742	68	293	81.6	0.3	0.7	0.3	0.3
45	43 -49	68 -09	9/X	1434	40	252	5.6				
46	44 -06	68 -00	9	1528	100	577	4.0	0.2			
47	44 -13	68 -04	10/X	0432	35	269	63.6			1.1	
48	44 -19	68 -08	10	0537	45	337	77.2	0.9			
49	44 -24	67 -40	10	0150	45	360	380.0				
50	44 -20	67 -41	10/X	0227	75	369	366.7				
51	44 -15	67 -40	9/X	1738	96	612	4.9			0.3	
52	44 -21	67 -15	9	1935	95	552	2.7			0.7	
53	44 -30	67 -20	10/X	0003	47	322	169.9				
54	44 -33	67 -17	9/X	2310	70	359	205.0				
55	44 -36	67 -09	9	2226	88	518	147.3				
56	44 -28	67 -09	9	2110	50	320	30.6				

Table 9.— Station data and larval fish

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Atl. herring	Pollock	Atl. cod	Silver hake	No./100 m ³	
											Paralepididae	Myctophidae
1	41 -13'	71 -01'	4/XII	1320	35	167				0.6		
2	41 -10	70 -04	4	1645	35	140			2.9			
3	41 -00	70 -40	4	1906	49	281	1.4			0.7		
4	41 -02	71 -00	4	2153	38	245			0.8			
5	41 -01	71 -26	5/XII	0112	55	301						
6	40 -45	71 -00	5	0413	60	369	21.1			0.5		
7	40 -30	71 -00	5	0715	81	494	14.2		1.4	1.0		0.4
8	40 -14	71 -31	5	1029	87	528				5.5	0.8	0.8
8.1	39 -55	71 -29	5	1320	109	684					2.8	1.2
9.1	40 -16	71 -00	5	1630	110	616	18.0	1.1		2.9	2.3	0.3
9	39 -59	71 -00	5	1905	107	625					12.3	2.2
10	40 -01	70 -30	5	2200	93	534	1.0			0.7	6.4	3.4
11	40 -16	70 -30	6/XII	0056	90	525	3.4			5.5	5.5	1.3
12	40 -16	70 -00	6	0352	90	481	14.8		0.2	2.5	0.6	
13	40 -01	70 -00	6	0629	115	667	0.1				0.7	0.3
14	40 -15	69 -29	6	1225	80	464	0.4			5.2	0.6	2.2
14.1	40 -01	69 -30	6	0950	113	648						
15	40 -15	69 -01	6	1548	115	515				1.6	2.7	0.2
16	40 -30	69 -00	6	1821	75	479	41.1		0.2	0.2		
17	40 -30	69 -31	6	2124	62	349	40.1					
18	40 -30	69 -58	6	2348	75	419	86.2	4.8	3.8			
19	40 -31	70 -29	7/XII	0255	70	377	40.8	1.6		0.5		
20	40 -44	70 -31	7	0419	55	278	65.8			0.4		
21	40 -40	70 -00	7	0718	53	270	74.1	6.3				
22	40 -55	69 -39	7	0929	38	214	3.7	57.0				
23	40 -45	69 -31	7	1051	53	234	14.5	41.0	0.9			
24	40 -45	69 -00	7	1343	85	447	21.9	11.9	0.2			
25	41 -00	69 -00	7	1547	79	430	1.6	10.2				
26	41 -00	69 -16	7	1810	44	275	7.6	50.9				
27	41 -15	69 -24	7	1947	45	237	0.4	40.5				
28	41 -16	69 -02	7	2222	108	701	0.1	0.1				
29	41 -31	69 -00	8/XII	0056	100	662	0.2			0.2		
30	41 -32	69 -24	8	0355	60	296						
31	41 -45	69 -30	8	0555	115	625	0.5		0.6			
32	41 -45	69 -00	8	0914	113	635						
33	41 -59	69 -00	8	1159	113	656						
34	42 -14	69 -29	8	1556	119	614						
35	41 -55	69 -49	8	2045	72	350	8.6	1.1				
36	42 -18	70 -00	8	2354	112	663	0.8			0.2		
37	42 -28	70 -00	9/XII	0200	112	581	0.2					
38	42 -45	70 -00	9	0433	95	541	1.7					
39	42 -46	70 -15	9	0558	50	271	0.7					
40	43 -00	70 -16	9	0809	117	588	0.3					
41	42 -59	69 -59	9	0958	100	578	0.7					
42	43 -15	70 -02	9	1239	100	642	1.9					
43	43 -30	69 -59	9	1433	95	532	3.9	0.2				
44	43 -30	69 -30	9	1756	110	532	2.6					
45	43 -00	69 -30	9	2130	98	631	1.3					
46	42 -30	69 -32	10/XII	0050	100	641	0.2					
47	42 -30	68 -30	10	0555	107	577	0.2					
48	42 -15	68 -30	10/XII	0752	105	558						
49	42 -00	68 -30	10	0935	92	620	0.2					
50	41 -45	68 -31	10	1148	110	618	0.2					
51	41 -30	68 -32	10	1344	100	539	9.5	0.4				

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Atl. herring	Pollock	Atl. cod	Silver hake	Paralepididae	Myetophidae
										No./100 m ³		
52	41°-16'	68°-31'	10	1614	50	282	85.8	2.8	1.1			
53	41 -00	68 -30	10	1908	54	268	86.9	0.4		0.4		
54	40 -45	68 -29	10	2138	40	216	97.2			1.4		
55	40 -30	68 -30	10	2319	78	498	23.9	0.4	1.2	0.6	2.2	
56	40 -16	68 -30	11/XII	0144	79	389	3.6					
57	41 -15	68 -00	11	0626	102	631	0.2				0.6	0.5
58	40 -30	68 -00	11	0936	107	640	0.3			0.2	0.8	
59	40 -44	68 -00	11	1344	75	494						
60	41 -00	68 -00	11	1706	44	242	263.2					
61	41 -16	67 -54	11	1839	39	204	138.7		2.5			
62	41 -26	68 -06	11	1946	35	222	251.8		3.2			
63	41 -49	68 -00	11	2146	45	247	43.3	0.4	8.9			
64	42 -00	68 -00	11	2332	95	645	0.6					
65	42 -14	68 -00	12/XII	0201	95	606	0.2					
66	42 -30	68 -00	12	0445	110	595	0.2	0.2				
67	42 -45	68 -00	12	0710	100	628						
68	42 -45	67 -30	12	0932	105	588						
69	42 -29	67 -28	12	1207	100	673						
70	42 -15	67 -29	12	1527	98	552						
71	42 -00	67 -33	12	1829	38	228	3.5		2.6			
72	41 -46	67 -30	12	2051	38	196	49.0	20.4	28.6			
73	41 -30	67 -29	12	2227	41	210	32.4	1.9	13.8			
74	41 -14	67 -29	13/XII	1245	35	253	105.1					
75	40 -58	67 -28	13	0258	62	373	201.9	0.3	1.2	0.3		
76	40 -45	67 -31	13	0419	80	476	25.0		0.6	0.8	1.3	
77	40 -30	67 -31	13	0646	95	571	0.2	0.4	0.2	0.2	1.2	0.2
77.1	40 -16	67 -30	13	0952	104	653					0.6	
78	40 -29	66 -59	13	1440	100	556					0.9	
79	40 -44	67 -00	13	1745	110	501	1.2	0.2				
80	41 -00	67 -00	13	2003	73	384	62.8	2.6	6.8			
81	41 -16	66 -59	13	2214	65	331	81.0	1.2	3.3			
82	41 -30	67 -01	14/XII	0014	64	353	34.0					
83	41 -43	66 -58	14	0206	59	332	63.6	0.3	3.0			
84	42 -00	67 -01	14	0504	68	398	1.8	1.0	1.8			
85	42 -15	67 -00	14	0741	97	642	0.1					
86	42 -30	67 -00	14	1039	104	563						
87	42 -30	66 -31	15/XII	1440	104	528						
88	42 -16	66 -29	15	1923	97	579						
89	42 -00	66 -30	15	2238	85	409	0.5					
90	41 -47	66 -30	16/XII	0112	83	446	1.3					
91	41 -31	66 -30	16	0355	93	495	6.3	1.0				
92	41 -15	66 -31	16	0614	90	516	6.8					
93	41 -00	66 -30	16	0828	95	584		0.2			0.2	0.2
94	41 -15	66 -01	16	1340	98	538					0.2	0.4
95	41 -29	66 -00	16	1755	98	516					0.2	
96	41 -44	66 -01	16	2135	95	559					0.4	
99	42 -14	65 -58	17/XII	1119	105	654	0.2	0.2				
101	42 -29	65 -59	17	1441	98	632						
103	42 -45	66 -30	17	1952	98	624		0.2		0.2	0.3	
104	42 -46	67 -01	17	2320	98	529						
125	42 -59	67 -29	18/XII	0325	98	526						
130	43 -00	68 -00	18	0642	105	550						
131	43 -00	68 -30	18	1015	105	515	0.2					
135	42 -59	69 -00	18	1604	98	577	0.2					

Table 10.—Station data and larval fish

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Northern sandlance	Pollock	No./100 m ³		
									Atl. cod	Atl. herring	Haddock
3	41°-00'	70°-40'	27/II	0839	55	303	13.2		1.3	2.0	
4	41 -00	70 -59	27/II	1130	62	280	2.9			0.4	
5	41 -00	71 -20	28/II	0400	47	197	3.6			0.5	
5.1	40 -45	71 -30	28	0219	59	312	4.2				
5.2	40 -30	71 -30	28	0019	22	135	11.1	5.2			
6	40 -46	71 -00	27/II	1313	58	345	3.5	0.6	1.5	0.7	0.7
7	40 -30	71 -01	27	1518	75	472	38.8	3.4		0.4	
8	40 -15	71 -30	27	2155	75	472	2.8	1.1			0.4
8.1	40 -00	71 -30	27	2022	90	619	4.2	0.3	0.2		0.5
9.1	40 -15	71 -00	27	1700	92	593	5.4	1.4	0.2		1.2
10	40 -00	70 -30	26/II	2133	100	666	0.6				
11	40 -15	70 -31	27/II	0042	95	633	28.0	2.7	1.1		0.6
12	40 -15	70 -00	26/II	0222	100	559	2.3	7.2			0.7
13	40 -00	70 -00	26	0515	97	602		0.3			
14	40 -15	69 -30	25/II	0846	62	504	2.4	10.3	1.6		0.6
14.1	40 -00	69 -29	25	0644	90	551					
15	40 -15	69 -00	24/II	0246	93	641	2.8	3.1	0.3	0.2	0.2
16	40 -30	69 -00	25/II	0101	62	381	12.3	3.4	0.8	1.3	0.5
17	40 -30	69 -30	25	1037	70	343	23.0	15.7	8.2		1.5
18	40 -30	70 -00	25	2240	59	324	71.9	25.6	6.2	0.6	3.7
19	40 -30	70 -30	27/II	0252	67	427	51.8	1.2	1.9		0.5
20	40 -45	70 -30	27	0544	52	282	9.2	1.4		4.3	
21	40 -40	70 -00	25/II	2002	41	240	44.2		0.4	9.2	
22	40 -54	69 -40	25	1450	42	206	12.6	2.9	1.9		
23	40 -45	69 -30	25	1233	42	243	10.7	18.9	0.8	0.4	0.4
24	40 -45	69 -00	24/II	2258	64	369	11.6	1.6	2.2	2.7	1.1
25	41 -00	69 -00	24	2027	67	407	24.1	7.4	1.0	0.2	0.7
26	41 -00	69 -17	24	1832	45	236	41.5	18.2		0.4	0.4
27	41 -15	69 -25	24	1543	42	204	2.0	4.4	0.5		
28	41 -15	68 -60	24	1333	98	559	11.3	1.6			
29	41 -30	69 -00	24	1050	96	664		0.5		0.2	
30	41 -30	69 -24	24	0904	66	339		1.5			
31	41 -44	69 -30	24	0706	105	629		0.2			
32	41 -45	69 -00	24	0400	85	699					
33	42 -00	69 -01	15/II	1744	108	694					
34	42 -15	69 -29	15	1409	25	150					
35	41 -56	69 -50	15	1120	21	377		2.1			
36	42 -18	70 -00	15	0815	103	473		0.2			
47	42 -13	68 -30	16/II	1440	108	755					
48	42 -15	68 -30	15/II	2135	105	725					
50	41 -45	68 -29	24/II	0212	90	659					
51	41 -30	68 -30	24	0010	93	692	1.0			0.2	
52	41 -15	68 -30	23/II	2236	45	278	4.3	0.7		0.4	0.4
53	41 -00	68 -30	23	2113	47	329	20.4		5.2	1.5	1.5

Sta.	Lat.	Long.	Date	Local Time	Sample Depth (m)	Volume Filtered (m ³)	Northern sandlance	No./100 m ³			
								Pollock	Atl. cod	Atl. herring	Haddock
54	40°-45'	68°-30'	23	1917	53	289	80.3	0.7	0.4	32.2	
55	40 -30	68 -30	23	1714	30	183	237.2	0.6	0.6	1.1	0.6
56	40 -15	68 -30	23	1521	98	651	0.2	3.1	0.6		0.6
58	40 -31	67 -59	23	1130	95	573					
59	40 -45	67 -59	23	1002	71	467	16.1	3.4	6.0		0.9
60	41 -00	68 -00	23	0808	53	216	181.5	6.9	6.5	9.3	
61	41 -16	67 -53	23/II	0618	25	160	361.8		8.8	21.2	
62	41 -25	68 -06	19/II	1820	25	156	59.0	0.6	6.4	27.6	
63	41 -50	67 -60	19	1523	43	292				0.3	
64	42 -00	68 -00	19	1357	95	698					
65	42 -15	67 -60	19	1116	112	700					
66	42 -30	68 -00	16/II	0249	110	629					
69	42 -30	67 -32	16	0607	108	728					
70	42 -15	67 -30	19/II	0857	89	713					
71	42 -00	67 -34	19	0705	28	277	4.7				
72	41 -45	67 -30	19	0505	36	286	12.6	9.4	3.5	0.7	
73	41 -30	67 -30	19	0445	34	221	10.4	2.7	2.7	3.2	
74	41 -15	67 -30	19	0222	35	226	10.2		0.4	22.1	
75	41 -00	67 -31	19	0054	48	447	27.7	4.5		10.7	0.2
76	40 -45	67 -30	18/II	2317	75	553		15.2			2.2
77	40 -31	67 -31	18	2141	85	742					
79A	40 -44	67 -01	18	1809	36	260					
79B	40 -46	67 -02	18	1822	79	662					
80	41 -01	67 -01	18	1515	60	338		4.4		0.6	
81	41 -15	67 -01	18	1254	67	362	3.9	20.2		0.8	3.6
82	41 -30	67 -00	18	1025	58	331	15.7	2.7		0.3	0.6
83	41 -45	66 -60	18	0819	55	320	16.2	4.7			
84	41 -59	67 -00	18	0632	59	337	17.5	1.8			
85	42 -15	67 -01	18	0333	100	628	6.8			0.2	
86	42 -30	67 -00	16	0826	105	658					
87	42 -30	66 -31	16	1250	120	618				0.2	
88	42 -15	66 -31	18	0008	95	669	0.4	0.3			0.2
89	41 -60	66 -30	17	2152	85	419	2.2	2.9		0.5	0.2
90	41 -45	66 -30	17	2001	90	390	2.0	4.6		0.5	
91	41 -30	66 -30	17	1821	83	577	0.4	10.6		0.7	
92	41 -15	66 -31	17	1534	85	574					
93	41 -00	66 -31	17	1302	100	652					
95	41 -30	66 -00	17	0825	103	669		0.5		0.2	
96	41 -45	66 -00	17	0613	98	624		0.3		0.3	
97	42 -00	65 -31	17	0138	105	675					
98	42 -00	65 -60	16	2200	105	635		0.9			
99	42 -15	66 -00	16	1910	120	652					
101	42 -30	66 -00	16	1630	115	679		0.2			

Table 11.— Length frequencies, Delaware II Cruise 71-4 and Albatross IV Cruise 71-7.

Standard Length(mm)	Delaware II 71-4						Albatross IV 71-7	
	Silver hake	Atl. herring	Red hake	Window-pane	Gulf Stream fld.	Butter-fish	Atl. herring	Pollock
2	1162		1594	80	132	44		
3	2553		2553	187	280	78		3
4	4903		2772	385	141	75		10
5	3336	412	1043	278	77	50		9
6	1302	1149	547	108	71	21	1	10
7	598	3047	326	54	61	3		6
8	250	2156	169	35	37	9	2	2
9	157	830	168	7	14	7	8	
10	85	1095	81	15	12	14	19	2
11	77	397	58	1	12	4	16	1
12	62	380	23	13	1	3	34	
13	4	357	47	1			58	
14	16	389	38		1		65	
15	14	381	20	4	2		64	
16	4	184	18			4	143	
17	7	65	8				255	
18	2	49	2				281	
19	3	12	15	3			253	
20	47	2	19				173	
21	45	8	2				124	
22	5	16	2				66	
23			1				39	
24	11	1	2				27	
25		1					7	
26							2	
27	9		2			1	4	
28	1						2	
29	1						1	
30						4	3	
31							1	
32	1							
33	1							
34							1	
35								
36							1	
Total	14656	10931	9510	1171	841	317	1650	43

Table 12.— Length frequencies, Albatross IV Cruises 72-9 and 73-91

Standard Length(mm)	Albatross IV 72-9					Albatross IV 73-91				
	Atl. herring	Atl. cod	Pollock	Silver hake	Red hake	Atl. herring	Atl. cod	Silver hake	Pollock	Red hake
2		69	7	2	1		101	1	1	
3		253	27	6			398	9	47	3
4	10	102	27	7	2	9	207	16	28	12
5	12	30	15	22	2	113	87	41	4	3
6	20	6	11	26		179	50	31		1
7	9	2	6	12		103	13	17	1	3
8	7	1	1	7	1	113	5	4		2
9	13	1		1		123	1	4		
10	33		1	1	2	102	1	7	2	1
11	118		1	1		86		1		1
12	158			1	1	156		1		3
13	109					211		2		1
14	77					256	1			2
15	78					435				1
16	123				1	697				
17	134					609				
18	130				1	612		2		1
19	117				1	516				
20	96					716				
21	87				1	486				1
22	67					319		1		
23	52					153				1
24	21					68				
25	18					10				
26	15					14				1
27	5					11				
28	5					12				
29	2					9				
30	1					2				
31	2									
32	2									
33						2				
34	1									
Total	1522	464	96	86	13	6123	864	137	83	37

Table 13.- Length frequencies, Albatross IV Cruise 74-2 and Delaware II Cruise 74-12.

<u>Albatross IV 74-2</u>						<u>Delaware II 74-12</u>				
Standard Length(mm)	Northern sand lance	Pollock	Atl. herring	Atl. cod	Haddock	Atl. herring	Fourbeard rockling	Red hake	Silver hake	Witch flounder
2				3			94	8	20	
3	1	25		59	7		270	143	89	2
4	18	152		93	33	9	112	123	118	6
5	51	162	1	61	16	100	8	50	49	8
6	71	95	1	17	10	663		16	22	7
7	66	55		7	4	2561	1	5	8	2
8	78	51		5		1663	2	1	5	5
9	102	27		2	1	312	2	4	1	2
10	120	10	2	1		456		3	3	5
11	71	4		1	1	439			3	6
12	59	1				352		1		2
13	63	1	1			440		1	2	
14	51					456				
15	51		1			249	1			1
16	37		5			111		1	1	
17	22		13			122			1	
18	18		7			176			1	
19	9		11			174			1	
20	25		17			153	1		3	
21	8		21			51			1	
22	9		29			44				
23	10		14			30				
24	5		37			21				
25	3		29			11	1			
26	3		25			7	1		1	
27	4		14			1				
28	5		16							
29	5		16							
30	4		12							
31	2		1							1
32	2		2							1
33			4							1
34	1									1
35	1									1
36										1
37										1
38										1
Total	974	583	279	249	72	8601	493	356	329	51

Table 14.- Length frequencies, Albatross IV Cruises 74-13 and 75-2.

Standard Length(mm)	Albatross IV 74-13				Albatross IV 75-2				
	Atl. herring	Pollock	Atl. cod	Silver hake	Northern sand lance	Pollock	Atl. cod	Atl. herring	Haddock
2		25	2	7		1	5		
3		346	129	18	1	92	88		12
4		241	84	26	6	222	203		54
5		60	10	16	14	193	87		33
6	10	27	2	21	67	175	43		11
7	8	12		16	137	99	14		10
8	11	11	1	5	193	59	3		4
9	54	1		7	308	26			1
10	204			7	488	27	2		1
11	418	1		5	468	11	2		
12	595	2		7	391	9	1		
13	687			4	387	9	1		
14	732	1		5	244	1			
15	665	1		2	203	2			
16	516			3	144	1		2	
17	480				101			2	
18	513				88	1		1	
19	513				63			3	
20	387			1	74			1	
21	290				31	1		10	
22	201				24			17	
23	110				28			25	
24	84				16			41	
25	52				7			37	
26	17			1	6			53	
27	27				5			37	
28	4				4			46	
29	8				2			37	
30	4							35	
31					1			22	
32								8	
33	1							8	
34								6	
35								5	
36									
37									
38									
39									
40									
41								1	
Total	6591	728	228	134	3501	929	449	397	126