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Ichthyoplankton
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Ichthyoplankton of the Gulf of Alaska near
Kodiak Island, March to June 1985

by

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INTRODUCTION

This report describes two cooperative U.S.-U.S.S.R. ichthyoplankton surveys (designated 1P085 and 2P085) conducted aboard the Soviet research vessel Poseydon off the Alaskan coast in the Gulf of Alaska from 29 March to 21 April and from 16 May to 8 June, 1985. Prior reports concerning ichthyoplankton of this area include Kendall et al. (1980), Bates and Clark (1983), Dunn et al. (1984), Kendall and Dunn (1985), Bates (1987), and Kendall et al. (1987). Similar U.S.-U.S.S.R. surveys have been conducted since 1981 to map the distribution of fish eggs and larvae with special regard to locating spawning concentrations of walleye pollock (Theragra chalcogramma) outside of Shelikof Strait, where a major spawning occurs (Kendall et al. 1987).

The objectives of the ichthyoplankton work on the Poseydon in 1985 were to investigate the dynamics of walleye pollock spawning by means of ichthyoplankton surveys in springtime in the northwestern Gulf of Alaska (Figure 1). These surveys were designed to seek evidence of concentrations of spawning walleye pollock as indicated by egg and larval catches and to monitor the distribution of larvae resulting from walleye pollock spawning in Shelikof Strait.

METHODS AND MATERIALS

Survey plans were established by Soviet ichthyologists and scientists of the NWAFC. The Poseydon, with Dr. V. Pashchenko serving as chief scientist, occupied the 154 stations of 1P085 (Figure 2) basically from northeast to southwest over a period extending from 29 March to 21 April, and the 189 stations of 2P085 (Figure 3) from 16 May to 8 June. Hydrographic and biological (neuston and bongo) samples were obtained at each station. Hydrographic samples were obtained to standard depths of 0, 10, 20, 30, 50,

75, 100, 150, 200, 250, 300, 400, 500, and 600 m as water depth permitted. Temperature, salinity, and dissolved oxygen determinations were made aboard ship from these samples. Computer character files detailing hydrographic values for these stations are maintained in the NWAFC ichthyoplankton data system. Results of these measurements will be reported elsewhere.

The neustonic layer was sampled with a 0.3 m high by 0.5 m wide Sameoto sampler (Sameoto and Jaroszynski 1969) fitted with a 0.505 mm mesh net. Two neuston samplers were towed simultaneously at each station, with one deployed to port and the other to starboard, for 10 min at a standard speed of 2.0 knots (1.0 m/sec). A standard MARMAP bongo tow (Smith and Richardson 1977) using 60 cm diameter samplers with 0.505 mm mesh nets was made with a maximum of 285 m of wire out at each station as depth permitted. Flowmeters in the mouth of the nets were used to determine the volume of water filtered. Typically, the Soviets retained one of the paired neuston and bongo samples and the Americans retained the other.

The American neuston and bongo samples were processed by the Polish Plankton Sorting Center in Szczecin, Poland, where displacement plankton volumes were determined (for bongo samples) and all fish eggs and larvae removed. The fish eggs were counted and walleye pollock eggs were staged to developmental periods (Matarese, pers. comm.), and the larvae were identified, counted, and measured. Upon the return of sorted specimens to the NWAFC, egg counts and staging were verified and identifications made by Ann Matarese and Debbie Blood, and larval identifications and counts were verified by Beverly Vinter and Bill Rugen. Identifications were made to the lowest taxonomic level possible, and in some cases "types" of unidentified eggs or larvae were established.

The number of eggs or larvae in a sample was converted to standardized catch (Smith and Richardson 1977), describing the observed number of animals per 10 m² of sea surface area for bongo samples and number per 1,000 m³ for neuston samples. The abundance of a taxon was expressed as the logarithm of the total number of eggs or larvae within the survey area; the calculation of a total was based on the Sette and Ahlstrom census as discussed by Richardson (1981). Walleye pollock egg staging data have been entered into the ichthyoplankton data system but results will not be reported here.

RESULTS

Throughout the results section, 1P085 (29 March to 21 April) is referred to as the first cruise and 2P085 (16 May to 8 June) is referred to as the second cruise. Tables 1 and 2 show the station position, GMT date and time of occupancy, polygonal station area (Richardson 1981), and standard haul factors for for neuston and bongo tows for each station occupied during the two cruises. Tables 3 and 4 summarize the catches of fish eggs and Tables 5 and 6 summarize the catches of larvae for neuston and bongo tows in terms of percent occurrence and logarithmic abundance. Eggs of 14 taxa were taken in the first cruise, and eggs of 17 taxa were taken in the second cruise. Larvae of 50 taxa were taken in the first cruise, and larvae of 71 taxa were taken in the second cruise. Juveniles of 10 taxa were recorded during the second cruise (Table 7). Figures 4-11 illustrate the rank abundances of egg and larval catches in bongo and neuston tows using several measures of abundance. Figures 12-50 show the geographic distribution, abundance at each station, and larval length frequencies for the more abundant taxa. Results of recurrent group analysis (Fager 1957) at the 0.4 affinity level showed no species groups in either net.

Relative Abundances

The rank order of abundance among the taxa depends on the measure of abundance examined. Three numerical measures of abundance for each net were used: total numbers caught, logarithmic abundance, mean number per 1,000 m³ (for neuston) and mean number per 10 m² (for bongo). Percent occurrence was also determined.

During the first cruise, egg abundances in both the neuston and bongo nets were dominated by Theragra chalcogramma (Figs. 4, 8). In both nets, eggs of various pleuronectids were also abundant. Hippoglossoides elassodon followed Theragra chalcogramma eggs in abundance in two of the four measures in the bongo net catches, while unidentified pleuronectid eggs were second in abundance in all measures in the neuston net catches. Other pleuronectid eggs in abundance in both nets were Platichthys stellatus and Glyptocephalus zachirus.

During the second cruise, the egg catches were more diverse (Figs. 5, 9). In the neuston net, eggs of Clupea harengus pallasii were dominant in three of the four measures. These demersal eggs were generally found attached to bits of kelp in the samples. Presumably, they had been spawned on anchored kelp, which then broke up and floated to the surface. Eggs of Theragra chalcogramma were less abundant in the second cruise than in the first, varying from second to fourth in abundance in bongo net collection, depending on the measure used, and varying from first to sixth in abundance in neuston net collections, depending on the measure used. Eggs of pleuronectids of several species were again abundant in this cruise, as they had been in the previous cruise. Microstomus pacificus eggs were first in abundance according to three measures, and second in abundance according to the other measure in bongo net collections; they appeared less abundant (third to ninth) in neuston net collections. Unidentified pleuronectid eggs made up a large

(second to sixth) part of both the neuston and bongo net collections. Hippoglossoides elassodon eggs were less abundant than in the first cruise, occupying the second to seventh rank among the measures for both nets. Glyptocephalus zachirus eggs again figured heavily in the bongo net collections and were present in the neuston collections also. Other pleuronectid eggs included those of Parophrys vetulus, Isopsetta isolepis, and Platichthys stellatus. Macrourid and Sebastolobus spp. eggs were also collected.

The larval catches in the bongo net during the first cruise were dominated by Ammodytes hexapterus, and Theragra chalcogramma ranked second according to all four measures of abundance (Fig. 10). Several other species varied widely in their rank abundance depending on the measure used. Lepidopsetta bilineata larvae were third in abundance based on three of the four measures, and Atheresthes stomias, Hippoglossoides elassodon and Stenobranchius leucopsarus ranked fourth according to one or two of the measures used.

In neuston catches during the first cruise, larvae of various species of Hexagrammos and Hemilepidotus made up the bulk of the catch (Fig. 6). Lyconectes aleutensis ranked highly also. Hexagrammos decagrammus ranked first based on all four measures. Hexagrammos spp. was second according to three measures, and Hemilepidotus hemilepidotus ranked from second to fifth among the measures used. Hemilepidotus spinosus ranked third to fifth. Ammodytes hexapterus and Theragra chalcogramma were present in the neuston catches, but did not contribute as heavily as they did in the bongo catches.

During the second cruise, bongo net catches showed Theragra chalcogramma larvae ranking first in three measures and second in the other one (Fig. 11). Bathymaster spp. larvae ranked second in three measures, and Hippoglossoides

elassodon and Ammodytes hexapterus varied from a rank of first to fifth depending on the measure used.

Neuston net catches during the second cruise showed Ammodytes hexapterus ranking first according to three of the four measures used (Fig. 7). Mallotus villosus, Lyconectes aleutensis, and Hexagrammos decagrammus larvae were ranked second according to at least one measure. Anoplopoma fimbria larvae ranked from third to sixth among the four measures.

Areal Distributions and Larval Sizes

While this is not intended to be a definitive report of these data, certain outstanding features in the distribution of the more abundant taxa will be mentioned. Larval lengths are reported in terms mean standard length (SL) and one standard deviation or range. As appropriate, occurrences are compared to those reported by Bates and Clark (1983), Kendall and Dunn (1985), and Bates (1987), which discuss ichthyoplankton of the northern Gulf of Alaska based on earlier cruises.

Mallotus villosus (Fig. 12)--Capelin larvae averaging 51.8 mm (SD 6.48) occurred in 14.7% of the neuston tows in the first cruise. They were widely scattered over the survey area, but seemed to have a center of concentration in lower Shelikof Strait. They also occurred in lower abundance in the bongo tows from the first cruise, as well as in both nets during the second cruise. On the second cruise, most occurrences were between lower Shelikof Strait and the Shumagin Islands. In previous studies, capelin larvae have been found throughout the northern Gulf of Alaska in rather low abundance in collections over the continental shelf. The larval period seems to last almost a year following spawning in summer. Thus, the large larvae collected here in spring had been spawned the previous summer.

Leuroglossus schmidti (Figs. 13-14)--Larvae of the northern smoothtongue were encountered in bongo net collections at a few stations in Shelikof Strait in the first cruise, as well as at stations near the shelf break. During the second cruise, they were found mainly over the continental shelf west of Kodiak Island, and across the shelf and into Shelikof Strait in the northern part of the survey area. The distribution pattern on the second cruise suggests that the larvae of this mesopelagic species were transported onto the shelf and into Shelikof Strait in the Alaskan coastal current. Northern smoothtongue larvae averaged 11.7 mm (SD 5.05) during the first cruise and 16.9 mm (SD 5.64) during the second cruise. In previous studies, northern smoothtongue eggs have been taken in fall through spring and the larvae have shown a similar increase in size during spring. Earlier studies have also found most eggs and larvae over slope waters, but with some larvae occurring over the shelf, again indicating intrusion of oceanic waters.

Stenobranchius leucopsarus (Figs. 15-16)--Northern lampfish larvae were found at low abundance ($<100/10 \text{ m}^2$) in bongo net collections on both cruises at stations scattered throughout the survey area, but most frequently they were in offshore collections. During the second cruise, they also occurred in the Amatuli Trough region and at nearly half the stations in Shelikof Strait. On both cruises, the larvae had a bimodal length distribution with one mode at 5-7 mm and the other at about 20 mm. Similar geographic and size distribution have been observed for this species in previous springtime ichthyoplankton surveys in the northern Gulf of Alaska.

Gadus macrocephalus (Fig. 17)--Larvae of Pacific cod averaging 8.0 mm (SD 1.60) were found in bongo tows during the second cruise. The largest catch (307 larvae/ 10 m^2) was near Unimak Pass, but they occurred most frequently, although in low numbers, in the Shelikof Strait area. They also occurred in

the Amatuli Trough region and south of the Trinity Islands, as well as over the sea valley west of Chirikof Island. Previous studies have reported Pacific cod larvae in springtime of sizes similar to those encountered here. They have previously been taken at scattered locations throughout the northern Gulf of Alaska and rather consistently between the Trinity Islands and Chirikof Island.

Theragra chalcogramma (Figs. 18-24)--Eggs and larvae of walleye pollock dominate the ichthyoplankton of the northern Gulf of Alaska in springtime, particularly the Shelikof Strait region. Walleye pollock eggs were collected in both neuston and bongo nets on both cruises. They were more abundant and widespread in bongo collections than in neuston collections, however, substantial numbers ($>5000/1000 \text{ m}^3$) of eggs were collected by the neuston net in upper Shelikof Strait during the first cruise. This was the only area where eggs were found in the neuston tows during the second cruise. In bongo net tows more than $100,000 \text{ eggs}/10 \text{ m}^2$ were found at four stations in lower Shelikof Strait during the first cruise. These samples were in a region where most collections had more than $10,000 \text{ eggs}/10 \text{ m}^2$. This is the time and area where maximum concentrations of walleye pollock eggs have previously been collected. In bongo collections, during the second cruise, most eggs were again found in Shelikof Strait but abundance there did not exceed $500 \text{ eggs}/10 \text{ m}^2$. Eggs were also found consistently at stations in the western part of the survey area near Unimak Pass.

Larvae of walleye pollock were collected in a few neuston tows on both cruises, and made up a substantial part of the catch in the bongo tows. During the first cruise, the larvae in the bongo tows averaged 4.8 mm (SD 0.58) and occurred at stations in lower Cook Inlet, lower Shelikof Strait, and over the continental shelf off Kodiak Island. Two stations south of the

Trinity Islands each produced catches of over 3000 larvae/10 m², the only catches greater than 1000 larvae/10 m² for the cruise. During the second cruise in bongo catches, walleye pollock larvae averaging 8.6 mm (SD 2.02) occurred throughout most of the survey area, except the shelf area between the Semidi and Shumagin Islands. Concentrations of more than 1000 larvae/10 m² were common in the Amatuli Trough area. In Shelikof Strait, most catches were greater than 100 larvae/10 m² and three exceeded 1000 larvae/10 m². The three largest catches were in upper Shelikof Strait, north of Kodiak Island. The largest catch in lower Shelikof Strait was 760 larvae/10 m² off Cape Kekurnoi. South of Shelikof Strait, over the sea valley between the Semidi Islands and Chirikof Island and over the outer shelf and slope between the Trinity and Shumagin Islands, larvae were found at nearly all stations but abundances were generally less than 100/10 m². In previous studies, walleye pollock larval abundance at this time of year has centered in the lower Shelikof area and the associated sea valley.

Sebastes spp. (Fig. 25)--Larvae of unidentified rockfishes averaging 5.4 mm (SD 1.01) were found in bongo tows primarily over the outer continental shelf and continental slope during the second cruise. A few were also found in Shelikof Strait and over the shelf west of the Shumagin Islands. Their maximum abundance was 1140 larvae/10 m² at a slope station south of the Semidi Islands and their abundance was between 100-1000 larvae/10 m² at 16 stations along the edge of the continental shelf. These collections probably represent the initial seasonal occurrence of rockfish larvae, which have not been in abundance in other springtime collections but have been found in summer collections in the northern Gulf of Alaska.

Hexagrammos decagrammus (Figs. 26-27)--Larvae of kelp greenling were collected in neuston tows during both cruises. During the first cruise they averaged

10.9 mm (SD 1.19) and during the second they were 13.2 mm (SD 2.96). During the first cruise, they were scattered throughout the survey area and abundances at 12 stations were greater than 1000 larvae/10 m²; no pattern of distribution was evident but larvae occurred at 75% of the stations sampled. During the second cruise, larvae occurred throughout the survey area and 78% of the stations. Most of the largest collections (>1000 larvae/1000 m³) were in Shelikof Strait with two such collections also occurring offshore, south of Chirikof Island near the edge of the shelf. Kelp greenling larvae have been an important part of the neuston community in spring in the northern Gulf of Alaska in all previous studies.

Hexagrammos stelleri (Fig. 28)--Larvae of whitespotted greenling averaging 28.4 mm (SD 5.55) were in 17% of the neuston tows during the first cruise. They were found at low abundance (<50/1000 m³) throughout the survey area, with most catches occurring in Shelikof Strait. As in previous springtime studies in this area, whitespotted greenling larvae were larger, closer to shore, and less abundant than kelp greenling larvae.

Hexagrammos spp. (Fig. 29)--Unidentified greenling larvae averaging 13.0 mm (SD 0.94) occurred in 11% of the neuston tows during the first cruise. They were mainly in Shelikof Strait where two catches exceeded 1000 larvae/1000 m³ and five others exceeded 100 larvae/1000 m³.

Anoplopoma fimbria (Fig. 30)--Sablefish larvae occurred in 16% of the neuston tows during the second cruise. They averaged 13.4 mm (SD 1.49) and were found mainly near the edge of the shelf and around the northern end of the Kodiak archipelago. Their abundance exceeded 1000 larvae/1000 m³ at 4 out of the 31 stations at which they occurred. Sablefish larvae have mainly been reported previously in low abundance summer collections in the northern Gulf of Alaska.

Hemilepidotus hemilepidotus (Figs. 31-32)--Larvae of red Irish lord were found in neuston collections in both cruises. In the first cruise, they averaged 9.4 mm (SD 1.14) and in the second 15.7 mm (SD 2.46). During the first cruise, they occurred primarily in Shelikof Strait, where 11 collections yielded 100-1000 larvae/1000 m³. They were found mainly south and west of Kodiak Island during the second cruise and abundances at five stations near the edge of the continental shelf exceeded 100/1000 m³. Similar sized larvae of red Irish lord have been taken in comparable abundances in springtime in previous studies to the area.

Hemilepidotus spinosus (Fig. 33)--In the first cruise larvae of the brown Irish lord were found in neuston tows mainly in Shelikof Strait, and their lengths averaged 7.6 mm (SD 0.74). At five stations in upper Shelikof Strait, 100-1000 larvae/1000 m³ occurred.

Bathymaster spp. (Fig. 34)--Larvae of unidentified searchers were found throughout the survey area in bongo tows on the second cruise. They averaged 5.8 mm (SD 0.58) in length, and occurred at 53% of the stations. The highest catch (2223 larvae/10 m²) occurred just west of the Shumagin Islands. Catches of 100-1000 larvae/10 m² occurred mainly south and west of Kodiak Island with smaller catches north and east of there. Similar to findings from other studies, this indicated that larvae of searchers are significant components of the ichthyoplankton assemblage in the northern Gulf of Alaska in spring and summer.

Lyconectes aleutensis (Figs. 35-36)--Larvae of dwarf wrymouth were found in neuston collections during both cruises. During the first cruise, they averaged 14.9 mm (SD 2.17) and during the second 16.4 mm (SD 3.35) in length. Abundance during the first cruise peaked at 100-1000 larvae/1000 m³ at nine

stations, eight of which were in Shelikof Strait. They were found in low abundance at scattered stations outside of Shelikof Strait. During the second cruise, larvae were more abundant, with seven catches of greater than 1000 larvae/1000 m³. The larvae were found throughout the survey area, and no pattern was evident in their distribution or abundance. Similar catches of dwarf wrymouth larvae have been made in previous studies to the area in springtime.

Ammodytes hexapterus (Figs. 37-39)--Pacific sand lance larvae were collected in abundance in bongo net tows on the first cruise and in both bongo and neuston net tows during the second cruise. Lengths in the bongo tows from the first cruise averaged 12.7 mm (SD 1.36) and 15.8 (SD 4.55) during the second cruise. In the neuston tows during the second cruise larvae averaged 23.6 mm (SD 3.86); considerably larger than larvae in the bongo tows taken at the same time. As in previous studies, the increase in proportion of larvae in the neuston net in the second cruise over the first, and the larger size of larvae in the neuston net over those in the bongo net during the second cruise seems to indicate an ontogenetic change in depth distribution of sand lance larvae, in that they become more neustonic as they grow and as the season progresses. During the first cruise, they occurred at nearly every station sampled (94% of the bongo stations), and were fairly even in abundance among the station. The largest catch was 1927 larvae/10 m² between the Trinity Islands and Chirikof Island. During the second cruise, larvae were taken in 68% of the bongo tows and were generally not as abundant as during the first cruise. The largest catch (466 larvae/10 m²) was made in Shelikof Strait where numerous stations yielded more than 100 larvae/10 m². Lower catches and many stations without sand lance larvae occurred west of the Shumagin Islands. Neuston catches of sand lance larvae during the second

cruise were more sporadic than bongo catches. Larvae occurred in 28% of the neuston tows. Their occurrences were scattered throughout the survey area and no pattern of distribution was evident. Catches at 13 stations exceeded 1000 larvae/1000 m³, and the highest catch (25,215 larvae/1000 m³) was made south of Chirikof Island.

Atheresthes stomias (Figs. 40-41)--Arrowtooth flounder larvae were collected in rather low numbers in bongo tows during both cruises. Most occurred near the edge of the continental shelf but they were also present in Shelikof Strait on both cruises. During the second cruise, they occurred at most stations in the Amatuli Trough region and in upper Shelikof Strait. On the first cruise, their abundance did not exceed 68 larvae/10 m², and on the second cruise a maximum of 100-200 larvae/10 m² was found at five stations, four of which were offshore in the Amatuli Trough region. Larvae averaged 8.0 mm (SD 1.47) during the first cruise and 14.3 mm (SD 3.34) during the second cruise. Previously, arrowtooth flounder larvae have been collected in slope waters during winter and spring. Their occurrence in upper Shelikof Strait during the second cruise reported here may indicate that these larvae were transported into this area in the Alaska coastal current.

Glyptocephalus zachirus (Fig. 42)--Eggs of rex sole were collected widely in bongo tows during the second cruise. In Shelikof Strait and in nearshore regions from Kodiak Island to Unimak Pass, they occurred at few stations and in generally low abundance. Offshore, they were fairly even in distribution and abundance with 34 stations producing between 100 and 572 eggs/10 m².

Hippoglossoides elassodon (Figs. 43-45)--Eggs of flathead sole were taken in bongo tows on both cruises, and their larvae were found in bongo tows

during the second cruise. The eggs during the first cruise occurred mostly in the Amatuli Trough area, and in lower Cook Inlet. On the second cruise, they were found mainly throughout the survey area northeast of the Semidi Islands. They also occurred at stations near Unimak Pass. Their maximum abundance during the first cruise was 356 eggs/10 m², and during the second cruise, a maximum abundance of 564 eggs/10 m² occurred at a station in Shelikof Strait. Flathead sole larvae from bongo tows during the second cruise occurred at most stations, except nearshore west of the Semidi Islands. Several catches in the inner Amatuli Trough region and Shelikof Strait were between 100 and 300 larvae/10 m², while elsewhere they were generally less than 100 larvae/10 m². The exception was a single station south of Chirikof Island where 581 larvae/10 m² were taken. The larvae averaged 6.9 mm (SD 1.34) during this cruise. The occurrences of flathead sole eggs and larvae reported here are similar to those reported previously, although previous sampling in May has not extended as far west as in the present cruise.

Lepidopsetta bilineata (Figs. 46-47)--Larvae of rock sole were found in bongo tows from both cruises. During the first cruise, they were mainly east of Kodiak Island, and in lower Cook Inlet and upper Shelikof Strait. They averaged only 4.2 mm (SD 0.69) in length. At the time of the second cruise they averaged 8.1 mm (SD 2.05) in length and occurred in lower Cook Inlet, Shelikof Strait, south of the Trinity Islands, and near Unimak Pass. On the second cruise, they were absent from the Amatuli Trough region, and the area between the Semidi and Shumagin Islands. They were in low abundance on both cruises, the maximum abundance during the first cruise was 252 larvae/10 m² at a station in the middle of the shelf off Kodiak Island. On the second

cruise, the maximum abundance was 114 larvae/10 m² at a station just east of the Trinity Islands.

Microstomus pacificus (Fig. 48)--Eggs of Dover sole were rather abundant offshore in bongo net collections during the second cruise. Between 100 and 900 eggs/10 m² were found at most stations over the slope, but very few were found over the shelf.

Unidentified pleuronectids (Figs. 49-50)--Unidentified eggs of flatfishes, averaging about 1 mm, were collected in both neuston and bongo nets during the first cruise. In both gears, they were primarily nearshore east of Kodiak Island and in Shelikof Strait. Abundance in the neuston net peaked at 3709 eggs/1000 m³ in lower Cook Inlet and in the bongo net at 478 eggs/10 m² at a station nearshore off northern Kodiak Island (where the second highest neuston catch was made).

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- Figure 16.--Distribution and size frequency distribution of larvae of Stenobranchius leucopsarus from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².
- Figure 17.--Distribution and size frequency distribution of larvae of Gadus macrocephalus from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².
- Figure 18.--Distribution of eggs of Theragra chalcogramma from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.
- Figure 19.--Distribution of eggs of Theragra chalcogramma from neuston tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 1000 m³.
- Figure 20.--Distribution of eggs of Theragra chalcogramma from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².
- Figure 21.--Distribution of eggs of Theragra chalcogramma from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10m².
- Figure 22.--Distribution and size frequency distribution of larvae of Theragra chalcogramma from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.
- Figure 23.--Distribution and size frequency distribution of larvae of Theragra chalcogramma from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².
- Figure 24.--Distribution and size frequency distribution of larvae of Theragra chalcogramma from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 25.--Distribution and size frequency distribution of larvae of Sebastes spp. from bongo tows during cruise 2PO85, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 26.--Distribution and size frequency distribution of larvae of Hexagrammos decagrammus from neuston tows during cruise 1PO85, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 27.--Distribution and size frequency distribution of larvae of Hexagrammos decagrammus from neuston tows during cruise 2PO85, May-June 1985. Abundance expressed as numbers per 1000 m³.

Figure 28.--Distribution and size frequency distribution of larvae of Hexagrammos stelleri from neuston tows during cruise 1PO85, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 29.--Distribution and size frequency distribution of larvae of Hexagrammos spp. from neuston tows during cruise 1PO85, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 30.--Distribution and size frequency distribution of larvae of Anoplopoma fimbria from neuston tows during cruise 2PO85, May-June 1985. Abundance expressed as numbers per 1000 m³.

Figure 31.--Distribution and size frequency distribution of larvae of Hemilepidotus hemilepidotus from neuston tows during cruise 1PO85, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 32.--Distribution and size frequency distribution of larvae of Hemilepidotus hemilepidotus from neuston tows during cruise 2PO85, May-June 1985. Abundance expressed as numbers per 1000 m³.

Figure 33.--Distribution and size frequency distribution of larvae of Hemilepidotus spinosus from neuston tows during cruise 1PO85, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 34.--Distribution and size frequency distribution of larvae of Bathymaster spp. from bongo tows during cruise 2PO85, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 35.--Distribution and size frequency distribution of larvae of Lyconectes aleutensis from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 36.--Distribution and size frequency distribution of larvae of Lyconectes aleutensis from neuston tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 1000 m³.

Figure 37.--Distribution and size frequency distribution of larvae of Ammodytes hexapterus from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

Figure 38.--Distribution and size frequency distribution of larvae of Ammodytes hexapterus from neuston tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 1000 m³.

Figure 39.--Distribution and size frequency distribution of larvae of Ammodytes hexapterus from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m³.

Figure 40.--Distribution and size frequency distribution of larvae of Atheresthes stomias from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

Figure 41.--Distribution and size frequency distribution of larvae of Atheresthes stomias from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 42.--Distribution of eggs of Glyptocephalus zachirus from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 43.--Distribution of eggs of Hippoglossoides elassodon from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

Figure 44.--Distribution of eggs of Hippoglossoides elassodon from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 45.--Distribution and size frequency distribution of larvae of Hippoglossoides elassodon bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 46.--Distribution and size frequency distribution of larvae of Lepidopsetta bilineata from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

Figure 47.--Distribution and size frequency distribution of larvae of Lepidopsetta bilineata from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 48.--Distribution and size frequency distribution of eggs of Microstomus pacificus from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

Figure 49.--Distribution of eggs of unidentified pleuronectids from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 50.--Distribution of eggs of unidentified pleuronectids from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

Table 1.--Data associated with bongo and neuston tows during cruise 1P085,
March-April 1985.

STATION	POSITION		DATE	POLYGONAL AREA	TIME	NEUSTON TOW		TIME	BONGO TOW	
	LAT (N)	LONG (W)				STANDARD FACTORS*	HAUL		STANDARD FACTORS*	HAUL
			YYMMDD	KM2	GMT	A	B	GMT	A	B
G001A	58 50.1	153 2.0	850329	257	0309	0.018	12.124	0250	7.539	4.896
G002A	58 44.2	152 51.0	850329	173	0458	0.016	10.655	0458	7.762	4.852
G003A	58 39.5	152 44.0	850329	172	0656	0.013	8.889	0627	8.758	4.314
G004A	58 34.2	152 52.0	850329	150	0855	0.014	9.317	0819	8.125	4.368
G005A	58 39.5	153 2.0	850329	143	1021	0.018	12.049	0956	8.257	5.293
G006A	58 40.0	153 14.0	850329	152	1223	0.017	11.437	1140	7.034	4.114
G007A	58 39.7	153 22.0	850329	139	1402	0.020	13.589	1348	7.882	12.315
G008A	58 34.5	153 13.0	850329	165	1550	0.016	10.363	1528	9.324	5.180
G009A	58 29.7	153 4.0	850329	176	1735	0.021	13.724	2100	7.975	4.893
G010A	58 21.5	153 12.0	850329	127	1923	0.019	12.575	1947	7.876	4.304
G011A	58 24.1	153 15.0	850329	126	2125	0.017	11.597	2100	7.679	4.571
G012A	58 29.5	153 24.0	850329	124	2313	0.018	11.902	2256	7.322	5.632
G013A	58 32.6	153 29.0	850330	117	0047	0.016	10.943	0028	7.694	6.107
G014A	58 29.1	153 43.0	850330	158	0205	0.015	10.271	0148	7.467	7.619
G015A	58 24.6	153 35.0	850330	165	0345	0.016	10.363	0323	7.839	4.930
G016A	58 18.8	153 26.0	850330	155	0539	0.017	11.659	0520	7.652	4.610
G017A	58 13.1	153 21.0	850330	167	0723	0.019	12.452	0659	9.435	4.625
G018A	58 8.0	153 29.0	850330	155	0852	0.018	11.702	0827	8.039	3.999
G019A	58 13.7	153 35.0	850330	154	1033	0.015	9.887	1013	7.992	4.391
G020A	58 19.0	153 43.0	850330	165	1211	0.015	9.946	1149	7.887	4.217
G021A	58 23.4	153 50.0	850330	194	1354	0.018	11.765	1340	7.845	5.726
G022A	58 14.5	153 56.0	850330	171	1524	0.016	10.408	1507	8.733	4.388
G023A	58 8.9	153 47.7	850330	171	1700	0.017	11.360	1641	8.798	4.377
G024A	58 2.9	153 39.0	850330	189	1845	0.018	11.832	1820	8.045	4.023
G025A	57 58.2	153 50.0	850330	153	2000	0.017	11.085	1945	7.873	4.188
G026A	58 3.8	153 58.0	850330	168	2133	0.017	11.085	2106	8.568	4.533
G027A	58 9.4	154 4.0	850330	163	2252	0.017	11.072	2228	7.590	3.776
G028A	58 2.4	154 15.0	850331	148	0042	0.017	11.312	0014	7.533	3.883
G029A	57 58.7	154 9.0	850331	156	0225	0.017	11.081	0202	7.610	3.963
G030A	57 53.9	154 0.0	850331	165	0428	0.017	11.236	0340	7.936	4.049
G031A	57 48.5	154 10.0	850331	161	0614	0.017	11.635	0552	7.720	3.860
G032A	57 52.5	154 21.0	850331	158	0817	0.022	14.675	0754	7.139	3.699
G033A	57 57.3	154 27.0	850331	177	0948	0.017	11.216	0927	7.975	3.948
G034A	57 54.3	154 40.0	850331	172	1145	0.016	10.640	1122	8.079	4.060
G035A	57 48.5	154 31.0	850331	181	1329	0.021	14.280	1308	7.457	3.844
G036A	57 42.7	154 21.0	850331	165	1513	0.020	13.290	1452	7.614	4.183
G037A	57 38.1	154 34.0	850331	150	1733	0.021	14.083	1713	7.697	3.848
G038A	57 43.5	154 43.0	850331	189	1916	0.017	11.190	1853	7.888	3.905
G039A	57 49.5	154 51.0	850331	186	2049	0.016	10.626	2030	7.471	4.017
G040A	57 55.8	154 55.0	850331	155				2149	6.677	14.516
G041A	57 33.1	154 44.0	850402	160	0302	0.015	10.306	0235	7.834	4.555
G042A	57 38.5	154 52.0	850402	163	0445	0.017	11.133	0425	7.774	3.887
G043A	57 44.2	155 3.0	850402	181	0742	0.022	14.930	0719	8.009	3.926
G044A	57 38.8	155 13.0	850402	180	0905	0.018	12.256	0844	7.762	3.940

* "A" CONVERTS CATCH TO CATCH PER 10M2, "B" CONVERTS CATCH TO CATCH PER 1000M3
(SEE SMITH AND RICHARDSON 1977)

Table 1.--Continued

STATION	POSITION		DATE	POLYGONAL AREA	TIME	NEUSTON TOW		TIME	BONGO TOW	
	LAT (N)	LONG (W)				STANDARD FACTORS*	HAUL		STANDARD FACTORS*	HAUL
			YYMMDD	KM2	GMT	A	B	GMT	A	B
G045A	57 33.2	155 3.0	850402	206	1031	0.018	11.815	1008	7.805	3.845
G046A	57 27.5	154 54.0	850402	186	1243	0.016	10.399	1217	8.098	4.049
G047A	57 22.4	155 5.0	850402	196	1500	0.016	10.701	1437	7.278	3.695
G048A	57 16.6	154 55.0	850402	231	1700	0.020	13.284	1638	7.922	4.920
G049A	57 11.1	154 46.0	850402	196	1833	0.019	12.392	1820	7.339	11.467
G050A	57 5.8	154 57.0	850402	316	2010	0.020	13.389	1951	8.899	6.054
G051A	57 12.5	155 10.0	850403	202	0609	0.018	12.326	0529	8.046	3.868
G052A	57 17.0	155 16.0	850403	200	0736	0.018	11.685	0710	7.160	3.690
G053A	57 22.2	155 25.0	850403	199	0935	0.019	12.826	0914	7.405	3.721
G054A	57 25.7	155 13.0	850403	214	1143	0.019	12.784	1108	7.573	3.786
G055A	57 33.9	155 24.0	850403	175	1429	0.020	13.234	1409	8.441	3.890
G056A	57 29.0	155 34.0	850403	199	1621	0.020	13.196	1600	8.425	4.012
G057A	57 23.0	155 46.0	850403	212	1808	0.021	13.823	1749	8.029	4.015
G058A	57 17.9	155 36.0	850403	195	1952	0.019	12.900	1927	8.595	4.192
G059A	57 12.4	155 46.0	850403	194	2205	0.021	13.730	2140	7.976	3.988
G060A	57 18.8	155 56.0	850404	214	0207	0.023	15.330	0138	8.369	4.164
G061A	57 13.6	156 6.0	850404	241	0418	0.020	13.121	0359	8.760	19.467
G062A	57 7.0	155 56.0	850404	290	0549	0.017	11.576	0527	8.089	4.065
G063A	57 2.2	155 46.0	850404	333	0736	0.017	11.435	0713	8.351	4.196
G064A	57 7.0	155 37.0	850404	173	0908	0.017	11.019	0841	7.828	3.934
G065A	57 12.2	155 26.0	850404	202	1100	0.017	11.222	1036	8.116	3.998
G066A	57 6.4	155 18.0	850404	191	1315	0.017	11.338	1247	8.682	4.194
G067A	57 1.0	155 28.0	850404	203	1515	0.021	14.187	1454	8.405	4.003
G068A	56 55.8	155 38.0	850404	253	1708	0.018	11.906	1646	8.491	4.044
G069A	56 50.2	155 29.0	850405	430	0506	0.018	11.859	0448	8.606	4.158
G070A	56 55.1	155 18.0	850405	348	0703	0.017	11.626	0639	8.017	4.009
G071A	57 0.9	155 8.0	850405	318	0900	0.018	11.783	0839	7.846	3.904
G072A	56 50.2	154 48.0	850405	861	1117	0.017	11.312	1103	3.223	8.057
G073A	56 43.8	154 28.0	850405	712	1311	0.018	12.300	1248	7.347	38.666
G074A	56 28.5	154 54.0	850405	776	1540	0.018	11.796	1530	6.410	45.783
G075A	56 38.3	155 11.0	850405	722	1816	0.021	13.914	1808	7.324	15.259
G076A	56 29.5	155 33.0	850405	797	2020	0.019	12.510	2009	6.789	10.133
G077A	56 39.6	155 50.0	850406	705	0258	0.018	12.112	0231	7.843	3.922
G078A	56 51.6	156 6.0	850406	590	0616	0.019	12.565	0547	7.651	4.070
G079A	57 0.0	156 19.0	850406	487	0811	0.017	11.285	0758	7.374	9.832
G080A	56 41.7	156 27.0	850406	645	1135	0.018	12.065	1110	8.022	4.052
G081A	56 48.5	156 37.0	850406	496	1320	0.017	11.260	1310	6.980	24.927
G082A	56 40.5	157 1.0	850406	399	1618	0.019	12.997	1601	8.427	5.772
G083A	56 31.5	156 49.0	850406	651	1812	0.018	12.189	1758	7.869	7.566
G084A	56 20.3	156 31.0	850406	917				2034	7.592	4.017
G085A	56 29.0	156 8.0	850407	825	0015	0.017	11.169	2354	7.229	3.707
G086A	56 17.5	155 52.0	850409	762	1003	0.018	12.291	0948	7.608	5.635
G087A	56 8.0	156 11.0	850409	878	1323	0.018	12.125	1256	7.223	3.612
G088A	55 56.5	155 51.0	850409	688	1555	0.020	13.441	1539	7.703	11.005

* "A" CONVERTS CATCH TO CATCH PER 10M2, "B" CONVERTS CATCH TO CATCH PER 1000M3
(SEE SMITH AND RICHARDSON 1977)

Table 1.--Continued

STATION	POSITION		DATE	POLYGONAL AREA	TIME	NEUSTON TOW		TIME	BONGO TOW	
	LAT (N)	LONG (W)				STANDARD FACTORS*	HAUL		STANDARD FACTORS*	HAUL
			YYMMDD	KM2	GMT	A	B	GMT	A	B
G089A	56 4.9	155 34.0	850409	698	1814	0.020	13.435	1807	7.599	24.512
G090A	56 15.9	155 16.0	850409	934	2055	0.018	12.160	2051	8.294	39.493
G091A	56 14.0	156 58.0	850411	944	1931	0.019	12.859	1920	8.433	11.244
G092A	56 26.1	157 17.0	850411	640				2249	7.528	3.941
G093A	56 12.0	157 33.0	850412	875	0230	0.018	11.915	0205	9.798	5.867
G094A	55 59.0	157 12.0	850412	923	0517	0.019	12.744	0503	8.304	8.142
G095A	55 46.7	156 52.0	850412	856	0743	0.016	10.907	0727	7.204	7.830
G096A	55 55.5	156 30.0	850412	757	1112	0.018	11.747	1049	8.345	4.173
G097A	55 45.0	156 13.0	850412	835	1425	0.024	16.001	1402	8.477	4.239
G098A	55 33.9	156 36.0	850412	809	1730	0.022	14.642	1712	7.292	3.942
G099A	55 23.2	156 17.0	850412	844	2001	0.016	10.486	1940	8.578	4.987
G100A	55 33.8	155 54.0	850413	871	0020	0.018	11.915	2305	10.602	5.551
G101A	55 25.0	155 34.0	850413	860	0310	0.018	11.808	0245	8.618	4.374
G102A	55 32.5	155 14.0	850413	720	0642	0.018	11.802	0627	9.310	4.655
G103A	55 40.1	155 27.0	850413	589	0906	0.016	10.909	0849	9.465	5.568
G104A	55 53.5	155 16.0	850413	794	1140	0.016	10.448	1132	8.699	17.057
G105A	56 4.2	154 54.0	850413	895	1430	0.018	11.915	1420	8.064	8.862
G106A	55 54.0	154 31.0	850413	918	1740	0.017	11.607	1719	9.052	4.459
G107A	55 42.2	154 52.0	850413	921	2051	0.017	11.479	2031	9.299	4.649
G108A	55 29.8	154 32.0	850414	932	0040	0.017	11.269	0017	10.109	4.907
G109A	55 41.0	154 10.0	850414	947	0346	0.018	11.846	0324	9.050	4.436
G110A	55 51.4	153 52.0	850414	882	0627	0.016	10.477	0605	8.658	4.351
G111A	56 3.6	154 9.0	850414	839	0835	0.016	10.792	0825	7.517	7.670
G112A	56 15.3	154 32.0	850414	930	1058	0.018	12.173	1044	5.636	7.045
G113A	56 23.7	154 11.0	850414	816	1335	0.023	15.424	1324	7.894	17.941
G114A	56 14.0	153 47.0	850414	886	1715	0.018	11.986	1703	7.128	8.385
G115A	56 2.5	153 28.0	850414	914	2055	0.017	11.278	2035	8.723	4.255
G116A	56 13.3	153 7.0	850415	995	0012	0.017	11.316	2351	8.587	4.168
G117A	56 24.5	153 26.0	850415	969	0307	0.016	10.889	0248	9.168	16.372
G118A	56 34.8	153 41.0	850415	699	0518	0.017	11.134	0509	7.287	9.342
G119A	56 47.4	153 14.0	850415	1105	0815	0.018	11.982	0758	8.413	6.141
G120A	56 34.0	152 50.0	850415	1310	1106	0.017	11.613	1054	8.821	11.027
G121A	56 17.9	152 26.0	850415	1300	1459	0.015	9.840	1442	8.809	4.318
G122A	56 31.0	151 59.0	850415	1312	1830	0.014	9.456	1810	9.755	4.805
G123A	56 45.8	152 23.0	850415	1262	2141	0.014	9.182	2122	7.640	4.494
G124A	57 0.5	152 47.0	850416	1200	0035	0.015	9.806	0020	8.957	7.789
G125A	57 13.5	152 20.0	850416	1210	0339	0.016	10.727	0331	8.465	11.138
G126A	56 59.0	151 56.0	850416	1336	0632	0.017	11.570	0621	7.812	9.889
G127A	56 44.1	151 31.0	850416	1372	1043	0.019	12.541	1020	7.675	3.936
G128A	56 57.4	151 4.0	850416	1485	1607	0.014	9.558	1546	8.512	4.256
G129A	57 12.2	151 28.0	850416	1316	1913	0.015	10.105	1903	7.759	14.368
G130A	57 26.6	151 52.0	850416	1495	2150	0.015	10.259	2139	7.670	11.801
G131A	57 40.0	151 24.0	850417	1248	0030	0.016	10.904	0022	7.872	13.120
G132A	57 25.0	151 0.0	850417	1316	0340	0.016	10.436	0330	8.255	9.072

* "A" CONVERTS CATCH TO CATCH PER 10M2, "B" CONVERTS CATCH TO CATCH PER 1000M3
(SEE SMITH AND RICHARDSON 1977)

Table 1.--Continued

STATION	POSITION		DATE	POLYGONAL AREA	TIME	NEUSTON TOW			BONGO TOW		
	LAT (N)	LONG (W)				STANDARD	HAUL	FACTORS*	TIME	STANDARD	HAUL
			YYMMDD	KM2	GMT	A	B		GMT	A	B
G133A	57 38.5	150 32.0	850417	1283	0700	0.016	10.429		0648	8.020	7.941
G134A	57 51.8	150 4.0	850417	1342	1010	0.014	9.305		0951	9.195	4.598
G135A	58 6.8	150 29.0	850417	1320	1335	0.015	10.110		1315	11.549	6.277
G136A	57 53.5	150 57.0	850417	1217	1614	0.016	10.400		1605	8.368	11.622
G137A	58 6.5	151 21.0	850417	1208	1940	0.016	10.845		1922	8.282	5.958
G138A	58 20.0	150 51.0	850418	1142	0016	0.019	12.627		0003	8.139	13.342
G139A	58 51.5	152 43.0	850419	172	0700	0.016	10.921		0639	9.210	4.847
G140A	58 57.8	152 52.0	850419	227	0932	0.013	8.900		0909	9.885	5.585
G141A	59 3.0	153 4.0	850419	220	1140	0.013	8.957		1116	8.809	6.075
G142A	59 8.6	153 13.0	850419	191	1320	0.017	11.204		1312	7.750	12.917
G143A	59 12.8	153 0.0	850419	191	1505	0.014	9.430		1452	9.153	10.170
G144A	59 7.0	152 50.0	850419	220	1645	0.015	9.893		1624	9.636	6.738
G145A	59 1.0	152 39.0	850419	182	1811	0.015	9.713		1757	9.314	6.559
G146A	58 55.6	152 30.0	850419	297	1938	0.016	10.532		1919	9.452	6.138
G147A	58 46.2	152 32.0	850419	470	2200	0.014	9.138		2140	9.890	5.020
G148A	58 35.3	152 3.0	850420	825	0045	0.015	10.134		0131	9.627	5.942
G149A	58 23.0	151 38.0	850420	1057	0617	0.016	10.402		0601	9.571	6.256
G150A	58 34.2	151 14.0	850420	959	0847	0.016	10.881		0829	10.746	6.321
G151A	58 46.8	151 37.0	850420	869	1115	0.015	10.242		1055	9.320	5.482
G152A	58 58.2	151 11.0	850420	774	1443	0.018	11.701		1424	7.342	5.063
G153A	58 44.9	150 49.0	850420	933					1917	4.505	3.387
G154A	57 53.8	151 48.0	850421	1610	0343	0.014	9.592		0330	7.961	13.269

* "A" CONVERTS CATCH TO CATCH PER 10M2, "B" CONVERTS CATCH TO CATCH PER 1000M3
(SEE SMITH AND RICHARDSON 1977)

Table 2.--Data associated with bongo and neuston tows during cruise 2P085, May-June 1985.

STATION	POSITION		DATE	POLYGONAL AREA	NEUSTON TOW			BONGO TOW		
	LAT (N)	LONG (W)			TIME	STANDARD HAUL	TIME	STANDARD HAUL		
									FACTORS*	
			YYMMDD	KM2	GMT	A	B	GMT	A	B
G001A	57 59.0	150 57.0	850516	1345	1315	0.016	10.968	1255	11.820	11.366
G002A	58 12.1	150 27.0	850516	1235	1603	0.016	10.357	1557	10.319	8.973
G003A	57 57.0	150 2.0	850516	1385	2149	0.014	9.168	2116	12.194	6.097
G004A	57 43.8	150 30.0	850517	1396	0042	0.015	9.976	0023	16.709	15.913
G005A	57 28.5	150 5.0	850517	1427	0455	0.015	10.062	0404	10.361	7.048
G006A	57 41.8	149 36.0	850517	1460	0825	0.013	8.994	0805	16.153	8.283
G007A	57 55.2	149 6.0	850517	1453	1343	0.016	10.658	1307	13.793	6.966
G008A	58 10.8	149 31.0	850517	1384	1635	0.015	9.710	1623	26.083	24.376
G009A	58 24.0	149 4.0	850517	1342	1933	0.015	10.250	1915	10.639	8.792
G010A	58 10.1	148 42.0	850517	1380	2153	0.018	11.675	2247	14.852	7.210
G011A	58 23.0	148 12.0	850518	1320	0508	0.015	9.992	0356	12.597	6.085
G012A	58 37.9	148 37.0	850518	1206	0622	0.016	10.835	0705	10.825	5.638
G013A	58 49.1	148 9.0	850518	1040	0912	0.014	9.443	1002	9.657	4.828
G014A	59 2.9	148 30.0	850518	1206	1221	0.015	9.812	1240	9.216	4.702
G015A	59 17.0	148 55.0	850518	1237	1520	0.014	9.533	1538	8.249	5.221
G016A	59 32.6	149 21.0	850518	1366	1925	0.016	10.384	2002	9.668	4.786
G017A	59 20.2	149 50.0	850518	1266	2245	0.019	12.334	2338	9.560	5.005
G018A	59 7.6	150 21.0	850519	1406	0222	0.016	10.845	0239	9.158	5.653
G019A	58 52.2	149 55.0	850519	1247	0542	0.018	12.237	0630	9.421	4.529
G020A	59 5.1	149 24.0	850519	1384	0903	0.020	13.079	1011	9.883	6.769
G021A	58 50.5	148 59.0	850519	1193	1249	0.015	10.263	1328	9.464	4.685
G022A	58 39.0	149 30.0	850519	1283	1555	0.015	9.706	1652	9.419	6.680
G023A	58 25.5	149 56.4	850519	1265	1923	0.014	9.613	1937	8.542	8.628
G024A	58 40.1	150 21.7	850519	1425	2250	0.021	13.876	2312	7.479	5.123
G025A	58 28.0	150 51.0	850520	1475	0517	0.016	10.851	0531	7.580	9.844
G026A	58 15.6	151 21.5	850520	1240	0834	0.018	12.219	0853	7.757	6.630
G027A	58 29.6	151 46.2	850520	1220	1150	0.016	10.446	1210	10.186	5.788
G028A	58 42.0	151 19.0	850520	1211	1449	0.015	10.199	1510	9.267	5.064
G029A	58 55.2	150 53.4	850520	1301	1755	0.017	11.301	1811	9.883	6.816
G030A	59 0.0	151 18.5	850520	664	2010	0.017	11.475	2026	11.502	10.090
G031A	59 1.3	151 46.0	850520	768	2203	0.016	10.370	2219	10.163	5.646
G032A	59 5.6	152 5.0	850521	519	0148	0.017	11.161	0126	9.510	5.283
G033A	59 5.6	152 31.0	850521	390	0320	0.018	12.087	0355	9.355	6.682
G034A	59 4.6	152 50.0	850521	388	0458	0.017	11.110	0516	8.779	6.054
G035A	58 56.9	153 9.0	850521	219	0657	0.017	11.067	0712	10.411	6.631
G036A	58 55.7	152 51.5	850521	323	0840	0.017	11.067	0852	9.064	5.395
G037A	58 55.1	152 32.4	850521	456	1023	0.016	10.739	1035	10.170	6.691
G038A	58 44.4	152 12.7	850521	967	1239	0.016	10.922	1351	10.343	8.274
G039A	58 45.9	152 34.2	850521	338	1531	0.017	11.143	1546	10.465	5.567
G040A	58 45.2	152 52.0	850521	305	1723	0.017	11.067	1742	10.528	7.066
G041A	58 45.4	153 7.5	850521	292	1852	0.017	11.287	1912	11.330	6.438
G042A	58 34.9	152 53.0	850521	229	2103	0.014	9.506	2118	10.098	5.738
G043A	58 14.0	153 19.0	850522	275	0135	0.019	12.542	0220	10.078	4.940
G044A	58 24.5	153 6.0	850522	377	0355	0.018	12.066	0410	12.279	6.265
G045A	58 34.8	153 8.5	850522	289	0544	0.018	11.872	0555	11.139	6.834
G046A	58 34.7	153 24.5	850522	343	0719	0.019	12.679	0732	12.055	8.799
G047A	58 24.5	153 25.6	850522	329	0901	0.022	14.609	0912	11.594	5.601
G048A	58 24.5	153 45.3	850522	451	1100	0.022	14.357	1114	10.132	5.066
G049A	58 13.9	153 55.0	850522	359	1250	0.019	12.419	1305	12.915	6.458
G050A	58 13.9	153 37.0	850522	315	1445	0.019	12.625	1541	10.530	5.949
G051A	58 4.7	153 34.9	850522	316	1647	0.018	12.158	1705	12.323	5.953
G052A	58 4.1	153 53.0	850522	325	2050	0.018	12.126	2029	11.206	6.057
G053A	58 4.1	154 10.1	850522	305	2147	0.017	11.000	2205	10.208	5.182
G054A	57 54.1	154 4.0	850522	400	2347	0.017	11.413	0003	11.515	5.815
G055A	57 54.0	154 22.0	850523	293	0153	0.018	12.329	0207	9.373	4.595
G056A	57 54.0	154 41.0	850523	335	0345	0.020	13.308	0400	10.647	5.324
G057A	57 43.8	154 25.0	850523	329	0545	0.018	12.267	0556	11.304	5.652
G058A	57 43.2	154 42.0	850523	318	0725	0.017	11.394	0741	10.594	5.324
G059A	57 43.9	155 1.4	850523	308	0921	0.021	14.107	0945	11.170	5.557
G060A	57 34.0	155 20.0	850523	336	1225	0.017	11.333	1246	10.262	4.981
G061A	57 34.0	155 2.0	850523	312	1428	0.017	11.234	1446	10.717	5.203
G062A	57 32.8	154 44.5	850523	335	1621	0.017	11.376	1637	11.352	6.136
G063A	57 23.9	155 3.0	850523	329	1936	0.016	10.525	2020	10.447	5.047

* "A" CONVERTS CATCH TO CATCH PER 10M2, "B" CONVERTS CATCH TO CATCH PER 1000M3
(SEE SMITH AND RICHARDSON 1977)

Table 2.--Continued

STATION	POSITION		DATE	POLYGONAL	NEUSTON TOW		BONGO TOW			
	LAT (N)	LONG (W)	YYMMDD	AREA KM2	TIME GMT	STANDARD HAUL FACTORS*		TIME GMT	STANDARD HAUL FACTORS*	
						A	B		A	B
G064A	57 23.9	155 21.1	850523	331	2142	0.016	10.824	2156	10.287	5.222
G065A	57 23.9	155 39.8	850523	323	2331	0.016	10.988	2347	10.432	5.242
G066A	57 14.0	155 39.8	850524	362	0136	0.016	10.835	0149	9.922	4.888
G067A	57 14.0	155 58.5	850524	311	0330	0.017	11.043	0344	9.971	4.888
G068A	57 3.6	155 56.0	850524	482	0541	0.017	11.636	0541	10.245	5.097
G069A	57 3.9	155 40.3	850524	372	0701	0.017	11.653	0717	10.216	5.057
G070A	57 3.6	155 20.7	850524	375	1043	0.024	15.737	0933	9.803	5.053
G071A	57 14.0	155 21.0	850524	344	1156	0.019	12.642	1218	10.781	5.285
G072A	57 14.0	155 2.5	850524	450	1420	0.018	11.963	1437	7.181	3.627
G073A	57 2.8	155 5.6	850524	661	1607	0.020	13.191	1626	11.463	5.790
G074A	56 51.9	154 43.2	850524	952	2000	0.018	11.912	2049	9.348	20.321
G075A	56 42.6	154 30.0	850524	767	2211	0.019	12.696	2231	8.495	56.631
G076A	56 29.5	154 53.3	850525	738	0045	0.017	11.101	0055	6.784	48.459
G077A	56 17.2	155 11.0	850525	800	0255	0.017	11.231	0317	8.242	35.837
G078A	56 5.6	154 52.0	850525	848	0500	0.017	11.536	0514	8.710	8.798
G079A	56 15.4	154 30.5	850525	936	0722	0.018	11.753	0736	9.273	10.910
G080A	56 25.5	154 7.0	850525	729	1003	0.020	13.005	1013	9.504	22.629
G081A	56 15.1	153 49.0	850525	818	1224	0.019	12.676	1243	9.511	9.805
G082A	56 35.1	153 43.6	850525	678	1458	0.018	12.139	1517	9.533	12.380
G083A	56 25.8	153 29.0	850525	748	1647	0.017	11.605	1702	9.488	15.303
G084A	56 14.0	153 10.0	850525	857	2157	0.018	12.009	2213	12.654	6.203
G085A	56 2.8	153 30.0	850526	923	0040	0.018	12.066	0052	9.390	4.767
G086A	55 51.2	153 52.0	850526	879	0310	0.020	13.292	0322	17.305	8.360
G087A	56 3.4	154 11.0	850526	877	0541	0.017	11.482	0556	14.909	7.973
G088A	55 53.0	154 33.0	850526	933	0801	0.021	13.803	0818	12.032	5.956
G089A	55 41.1	154 14.0	850526	940	1059	0.021	14.187	1112	11.055	5.473
G090A	55 30.5	154 35.8	850526	839	1328	0.019	12.585	1347	10.486	5.243
G091A	55 42.6	154 54.5	850526	852	1612	0.017	11.541	1634	13.069	6.344
G092A	55 32.8	155 14.3	850526	998	1849	0.017	11.348	1906	18.103	9.097
G093A	55 43.0	155 29.0	850526	797	2227	0.020	13.141	2246	10.218	10.117
G094A	55 54.5	155 13.0	850527	854	0038	0.019	12.400	0052	9.419	16.524
G095A	56 6.7	155 32.7	850527	758	0234	0.020	13.486	0306	9.678	21.040
G096A	55 57.0	155 52.0	850527	891	0446	0.016	10.814	0457	9.466	14.790
G097A	56 8.3	156 9.8	850527	771	0646	0.018	12.074	0702	10.190	4.876
G098A	56 18.4	155 50.9	850527	725	0903	0.017	11.586	0924	9.470	12.972
G099A	56 29.5	155 30.0	850527	750	1131	0.019	12.556	1149	10.429	20.448
G100A	56 40.0	155 10.0	850527	980	1335	0.019	12.599	1411	9.417	14.055
G101A	56 52.0	155 28.0	850527	642	1532	0.019	12.993	1548	9.627	4.766
G102A	56 41.1	155 48.5	850527	811	2041	0.016	10.820	2041	8.468	4.277
G103A	56 52.0	156 6.1	850527	689	2231	0.016	10.467	2255	9.056	4.741
G104A	56 41.9	156 27.3	850528	652	0126	0.016	10.431	0139	9.223	4.682
G105A	56 30.7	156 9.5	850528	749	0423	0.017	11.603	0436	9.991	4.946
G106A	56 20.8	156 29.0	850528	906	0706	0.016	10.947	0719	9.326	4.617
G107A	56 31.6	156 48.8	850528	661	0945	0.015	10.136	1000	8.741	8.487
G108A	56 13.3	156 56.8	850528	974	1251	0.018	11.907	1333	6.947	8.576
G109A	56 24.0	157 14.0	850528	644	1506	0.016	10.529	1524	8.545	8.377
G110A	56 11.2	157 31.5	850528	679	1735	0.016	10.425	1830	9.503	5.794
G111A	55 58.9	157 12.6	850528	869	2030	0.017	11.030	2050	7.552	7.477
G112A	55 46.8	156 54.4	850528	905	2247	0.017	11.457	2310	8.087	8.603
G113A	55 57.6	156 32.9	850529	1001	0205	0.024	15.683	0222	9.359	4.727
G114A	55 45.4	156 14.0	850529	1011	0452	0.018	11.920	0507	13.010	6.346
G115A	55 34.7	156 35.0	850529	823	0825	0.021	13.988	0732	10.995	5.338
G116A	55 22.2	156 16.1	850529	880	1001	0.020	13.141	1014	12.313	6.655
G117A	55 32.5	155 54.7	850529	923	1300	0.016	10.845	1314	11.218	5.935
G118A	55 21.9	155 38.5	850529	960	1533	0.020	13.646	1551	10.862	5.325
G119A	55 10.1	155 57.5	850529	894	2047	0.017	11.501	2109	10.230	5.301
G120A	55 1.0	156 16.0	850530	849	0000	0.018	11.768	0018	10.001	4.927
G121A	55 12.0	156 36.7	850530	900	0423	0.018	11.758	0438	9.940	4.689
G122A	55 24.5	156 55.1	850530	879	0725	0.019	12.497	0738	7.302	8.905
G123A	55 35.5	157 15.2	850530	841	0951	0.015	10.159	1007	8.444	10.298
G124A	55 48.4	157 32.9	850530	901	1209	0.009	6.228	1226	8.094	8.345
G125A	56 0.6	157 50.4	850530	729	1427	0.016	10.918	1513	8.780	6.409
G126A	55 51.7	158 12.4	850530	857	1730	0.016	10.372	1748	8.291	12.193

* "A" CONVERTS CATCH TO CATCH PER 10M2, "B" CONVERTS CATCH TO CATCH PER 1000M3
(SEE SMITH AND RICHARDSON 1977)

Table 2.--Continued

STATION	POSITION		DATE	POLYGONAL AREA	TIME	NEUSTON TOW		TIME	BONGO TOW	
	LAT (N)	LONG (W)				STANDARD FACTORS*	HAUL		STANDARD FACTORS*	HAUL
G127A	55 40.1	157 55.2	850530	866	2101	0.017	11.371	2119	8.512	7.094
G128A	55 27.9	157 36.6	850531	915	0018	0.019	12.627	0030	7.524	8.550
G129A	55 16.0	157 17.3	850531	966	0301	0.018	11.812	0312	9.653	10.492
G130A	55 4.2	156 58.5	850531	912	0533	0.019	12.351	0550	10.081	4.870
G131A	54 52.1	156 40.5	850531	1036	0908	0.017	11.468	0924	10.709	4.981
G132A	54 51.8	157 19.7	850531	824	1312	0.016	10.968	1420	9.062	4.399
G133A	54 41.1	157 42.0	850531	886	1618	0.016	10.994	1636	9.233	4.594
G134A	55 2.3	157 39.2	850601	889	0437	0.017	11.319	0453	8.108	12.668
G135A	55 14.7	157 56.6	850601	978	0659	0.017	11.011	0709	8.096	10.379
G136A	55 27.5	158 16.6	850601	985	0917	0.016	10.928	0930	9.541	6.914
G137A	55 39.4	158 35.7	850601	832	1213	0.016	10.731	1225	9.041	9.517
G138A	55 29.6	158 58.0	850601	882	1427	0.016	10.899	1441	9.099	8.198
G139A	55 17.5	158 43.8	850601	949	1648	0.021	14.085	1704	9.758	5.136
G140A	55 6.5	158 59.5	850601	1082	2027	0.024	16.173	2046	8.085	12.833
G141A	54 54.0	158 41.9	850601	1122	2253	0.016	10.912	2316	9.042	8.865
G142A	55 3.5	158 21.6	850602	850	0118	0.018	12.019	0132	9.762	5.547
G143A	54 53.1	158 2.9	850602	918	0348	0.016	10.783	0405	8.540	8.626
G144A	54 42.1	158 21.2	850602	1167	0614	0.016	10.704	0715	13.008	6.705
G145A	54 29.9	158 4.0	850602	1153	0933	0.016	10.674	0949	8.811	4.542
G146A	54 12.0	158 29.0	850602	1868	1243	0.015	10.324	1302	9.107	4.599
G147A	54 22.8	158 49.0	850602	1784	1530	0.019	12.984	1545	11.553	5.581
G148A	54 37.3	159 13.3	850602	1556	1936	0.019	12.619	1950	2.383	3.724
G149A	54 8.3	159 28.1	850603	1181	0101	0.019	12.802	0116	9.400	4.724
G150A	54 20.7	159 47.7	850603	1625	0401	0.018	12.307	0415	9.292	4.555
G151A	54 34.1	160 7.5	850603	1577	0651	0.016	10.983	0706	8.690	8.690
G152A	54 46.6	160 36.0	850603	1317	1001	0.018	12.134	1018	8.328	9.052
G153A	55 0.0	160 46.0	850603	1195	1246	0.018	12.302	1303	8.467	11.441
G154A	54 45.3	161 18.5	850603	1318	1544	0.019	12.891	1601	10.801	7.826
G155A	54 31.9	161 1.0	850603	1442	1815	0.019	12.417	1834	8.475	7.062
G156A	54 19.2	160 42.9	850603	1405	2053	0.020	13.187	2310	8.819	5.653
G157A	54 6.1	160 23.0	850604	1803	0541	0.020	13.238	0556	10.306	5.127
G158A	54 2.5	161 13.0	850604	1468	1027	0.023	15.193	1040	10.660	5.125
G159A	54 14.9	161 33.2	850604	1684	1355	0.022	14.486	1414	7.863	6.958
G160A	54 28.2	161 52.5	850604	1448	1650	0.016	10.765	1706	8.516	6.501
G161A	54 13.3	162 26.0	850604	1413	2023	0.018	12.123	2056	13.873	22.743
G162A	53 59.9	162 8.0	850605	1682	0056	0.017	11.364	0113	9.749	4.756
G163A	53 46.0	161 48.7	850605	1559	0405	0.018	11.922	0421	9.449	4.587
G164A	53 43.1	162 40.5	850605	1695	0902	0.020	13.417	0920	8.456	4.293
G165A	53 55.5	163 0.2	850605	1629	1302	0.017	11.276	1322	9.066	4.533
G166A	54 8.8	163 20.0	850606	1583	0110	0.018	12.142	0127	9.472	12.629
G167A	54 22.2	163 38.6	850606	1535	0349	0.018	11.844	0402	13.719	14.441
G168A	54 33.1	163 55.4	850606	2193	0557	0.019	12.784	0615	9.577	14.733
G169A	54 21.0	164 24.0	850606	1084	0851	0.020	13.222	0909	8.761	10.816
G170A	54 8.0	164 14.0	850606	1443	1103	0.021	13.831	1115	9.275	13.443
G171A	53 54.4	163 54.8	850606	1500	1326	0.019	12.888	1341	10.372	14.016
G172A	53 41.1	163 35.4	850606	1699	1538	0.019	12.551	1554	10.391	5.044
G173A	53 37.9	164 24.7	850606	1715	1939	0.020	13.273	2000	10.458	5.229
G174A	53 51.2	164 45.4	850607	1493	0050	0.019	12.810	0029	10.649	10.978
G175A	53 59.3	165 5.7	850607	921	0215	0.019	12.714	0235	11.000	12.088
G176A	53 49.0	165 37.0	850607	1016	0511	0.017	11.392	0527	11.702	15.813
G177A	53 34.8	165 18.7	850607	1358	0900	0.022	14.574	0800	11.169	5.585
G178A	53 34.1	165 44.0	850607	853	1043	0.020	13.141	1058	12.231	11.119
G179A	53 21.9	165 53.3	850607	1125	1252	0.022	14.388	1311	11.527	5.706
G180A	53 33.7	166 17.0	850607	845	1555	0.020	13.011	1612	9.708	15.168
G181A	53 22.4	166 19.9	850627	809	1756	0.020	13.568	1812	10.817	5.355
G182A	53 9.0	166 29.5	850607	1015	2132	0.022	14.918	2151	11.100	5.441
G183A	53 21.0	166 45.9	850608	638	0030	0.020	13.241	0110	10.017	10.327
G184A	53 10.5	166 55.6	850608	878	0234	0.020	13.644	0247	10.584	5.373
G185A	52 58.2	167 5.6	850608	1065	0444	0.020	13.652	0458	10.248	5.099
G186A	53 10.9	167 22.1	850608	743	0739	0.023	15.652	0755	14.168	18.642
G187A	53 2.3	167 34.0	850608	723	0933	0.024	15.687	0952	12.698	11.337
G188A	52 51.2	167 43.9	850608	604	1143	0.022	14.694	1200	10.943	5.444
G189A	53 0.5	167 59.0	850608	869	1415	0.022	14.676	1434	17.718	15.680

* "A" CONVERTS CATCH TO CATCH PER 10M2, "B" CONVERTS CATCH TO CATCH PER 1000M3
(SEE SMITH AND RICHARDSON 1977)

Table 3.--Fish eggs collected in bongo and neuston tows during cruise 1P085,
March-April 1985.

SPECIES	NEUSTON		BONGO	
	OCCUR. %	LOG NO. IN AREA	OCCUR. %	LOG NO. IN AREA
UNIDENTIFIED	0.67	5.3780	1.30	9.1104
DISINTEGRATED			0.65	9.4785
LEUROGLOSSUS SCHMIDTI			0.65	9.0590
THERAGRA CHALCOGRAMMA	80.00	9.4957	84.42	13.5134
MACROURIDAE			1.30	9.2884
TRACHIPTERUS ALTIVELIS	5.33	7.4631		
SEBASTOLOBUS SPP.	0.67	5.6088	0.65	9.0132
PLEURONECTIDAE	19.33	8.8010	12.99	10.9621
GLYPTOCEPHALUS ZACHIRUS	7.33	7.6724	1.95	9.6681
HIPPOGLOSSOIDES ELASSODON	4.67	7.4670	12.34	11.0287
LYOPSETTA EXILIS	0.67	5.4809		
MICROSTOMUS PACIFICUS	0.67	6.2861		
PLATICHTHYS STELLATUS	4.67	7.0032	2.60	9.1027
PLEURONECTES QUADRITUBERCULATUS			1.30	8.2787

Table 4.--Fish eggs collected in bongo and neuston tows during cruise 2P085,
May-June 1985.

SPECIES	NEUSTON		BONGO	
	OCCUR. %	LOG NO. IN AREA	OCCUR. %	LOG NO. IN AREA
UNIDENTIFIED	0.53	5.7131	4.76	10.1570
TELEOST TYPE A			8.99	10.4359
TELEOST TYPE H	0.53	6.1997		
DISINTEGRATED			1.06	9.6995
CLUPEA HARENGUS PALLASI	2.12	9.0344		
LEUROGLOSSUS SCHMIDTI			2.65	9.9073
THERAGRA CHALCOGRAMMA	4.76	8.3149	31.75	11.7399
MACROURIDAE			13.76	11.1215
SEBASTOLOBUS SPP.	2.12	6.7226	0.53	9.1163
PLEURONECTIDAE	3.17	8.4821	9.52	11.4711
GLYPTOCEPHALUS ZACHIRUS	1.59	7.8049	52.38	12.0429
HIPPOGLOSSOIDES ELASSODON	4.23	7.9121	37.04	11.3725
ISOPSETTA ISOLEPIS	1.06	7.0035	2.65	10.3150
MICROSTOMUS PACIFICUS	3.70	7.8813	42.86	12.2230
PAROPHRYS VETULUS	2.12	7.4902	4.23	10.5131
PLATICHTHYS STELLATUS	3.17	7.7589	1.06	9.1231
PLEURONECTES QUADRITUBERCULATUS	1.59	6.5794	2.12	9.1965

Table 5.--Fish larvae collected in bongo and neuston tows during cruise 1P085, March-April 1985.

SPECIES	NEUSTON		BONGO	
	OCCUR. %	LOG NO. IN AREA	OCCUR. %	LOG NO. IN AREA
DISINTEGRATED	11.33	7.9139	5.19	9.7675
MALLOTUS VILLOSUS	14.67	7.9677	7.14	10.0752
BATHYLAGIDAE			1.95	9.0373
BATHYLAGUS MILLERI			1.30	9.3070
BATHYLAGUS PACIFICUS			6.49	10.0219
LEUROGLOSSUS SCHMIDTI			17.53	10.3600
STENOBRACHIUS LEUCOPSARUS	0.67	6.1330	18.83	10.6216
TARLETONBEANIA CRENUULARIS			0.65	8.1317
PROTOMYCTOPHUM THOMPSONI			7.14	10.0106
GADIDAE			1.95	9.6244
GADUS MACROCEPHALUS			3.25	10.0744
THERAGRA CHALCOGRAMMA	4.00	7.2943	46.75	12.1161
ZOARCIDAE			0.65	8.0803
TRACHIPTERIDAE			0.65	8.8092
SEBASTES SPP.			0.65	8.9017
HEXAGRAMMOS SPP.	11.33	8.2704		
HEXAGRAMMOS DECAGRAMMUS	75.33	9.4930	7.14	9.8682
HEXAGRAMMOS STELLERI	17.33	7.5114		
OPHIODON ELONGATUS	0.67	6.0428		
COTTIDAE			7.14	9.9069
ARTEDIUS FENESTRALIS			0.65	7.9988
ARTEDIUS HARRINGTONI			0.65	8.9486
GYMNOCANTHUS SPP.			0.65	8.7071
HEMILEPIDOTUS HEMILEPIDOTUS	30.00	8.2469	2.60	9.2902
HEMILEPIDOTUS JORDANI	7.33	7.9274		
HEMILEPIDOTUS SPINOSUS	21.33	8.1159		
LEPTOCOTTUS ARMATUS			0.65	8.8092
MALACOCOTTUS ZONURUS 1			0.65	8.3698
MALACOCOTTUS ZONURUS 2			0.65	8.9083
MYOXOCEPHALUS G	0.67	5.4407		
RADULINUS ASPRELLUS			1.30	8.8222
AGONIDAE	0.67	6.2761	9.09	9.9956
CYCLOPTERIDAE	0.67	5.9178	10.39	9.7359
PARALIPARIS SPP.			1.30	8.4065
BATHYMASTER SPP.	4.67	7.0743	0.65	8.6672
STICHAEIDAE	10.67	7.3953	1.95	9.1616
ANOPLARCHUS SPP.			0.65	9.3091
LUMPENUS SAGITTA			4.55	9.3714
LUMPENUS MACULATUS			4.55	9.8573
POROCLINUS ROTHROCKI			1.30	8.9588
DELOLEPIS GIGANTEA	0.67	6.6943		
LYCONNECTES ALEUTENSIS	26.00	8.2479	1.30	9.4689
PHOLIS SPP.			1.30	9.0699
ZAPRORA SILENUS	1.33	6.5884		
AMMODYTES HEXAPTERUS	6.00	7.8833	94.16	12.1400
ATHERESTHES STOMIAS			15.58	10.6911
HIPPOGLOSSOIDES ELASSODON			0.65	8.6266
HIPPOGLOSSUS STENOLEPIS			3.25	9.7312
LEPIDOPSETTA BILINEATA			24.03	11.0003
REINHARDTIUS HIPPOGLOSSOIDES			1.30	8.9362

Table 6.--Fish larvae collected in bongo and neuston tows during cruise 2P085,
May-June 1985.

SPECIES	NEUSTON		BONGO	
	OCCUR. %	LOG NO. IN AREA	OCCUR. %	LOG NO. IN AREA
UNIDENTIFIED			2.65	9.8389
DISINTEGRATED	21.69	8.9211	6.88	10.4331
ONCORHYNCHUS KETA	0.53	5.7303		
MALLOTUS VILLOSUS	4.76	8.4275	2.12	9.6850
BATHYLAGIDAE	0.53	5.8662		
BATHYLAGUS MILLERI			3.17	9.9509
BATHYLAGUS PACIFICUS			14.29	10.6760
LEUROGLOSSUS SCHMIDTI			35.45	11.1020
CYCLOTHONE SPP.			0.53	9.0484
STENOBRACHIUS LEUCOPSARUS			29.10	11.0846
PROTOMYCTOPHUM THOMPSONI			6.35	10.2376
GADIDAE	0.53	6.6054	0.53	9.3222
GADUS MACROCEPHALUS	1.06	6.4604	33.33	11.1454
THERAGRA CHALCOGRAMMA	7.94	8.0273	67.20	12.5081
MACROURIDAE			4.23	10.1434
SEBASTES SPP.	6.35	8.5366	47.09	11.8653
ANOPLOPOMA FIMBRIA	16.40	9.3266	6.35	10.3285
HEXAGRAMMIDAE	0.53	6.5538		
HEXAGRAMMOS SPP.	6.88	8.1638		
HEXAGRAMMOS DECAGRAMMUS	77.78	9.5642	1.59	9.9653
HEXAGRAMMOS OCTOGRAMMUS	4.23	7.2935		
HEXAGRAMMOS STELLERI	13.23	7.7954		
OPHIODON ELONGATUS	8.47	7.8080	1.06	9.0525
PLEUROGRAMMUS MONOPTERYGIUS	0.53	6.1994		
COTTIDAE	1.59	6.4767	29.10	11.0384
ARTEDIUS HARRINGTONI			6.88	9.9240
ARTEDIUS MEANYI			3.70	9.7301
BLEPSIAS BILOBUS	0.53	6.2417	0.53	9.3222
DASYCOTTUS SETIGER			0.53	8.8512
ENOPHRYS BISON	0.53	5.8146		
GYMNOCANTHUS A			0.53	8.5249
HEMILEPIDOTUS HEMILEPIDOTUS	22.22	8.6756		
HEMILEPIDOTUS JORDANI	7.41	7.7887		
HEMILEPIDOTUS SPINOSUS	2.12	7.0198		
ICELINUS SPP.			0.53	9.1054
LEPTOCOTTUS ARMATUS	0.53	5.8138	1.06	9.0045
MALACOCOTTUS ZONURUS 1			1.59	9.0662
MYOXOCEPHALUS SPP.	7.94	7.8732	3.70	9.6985
MYOXOCEPHALUS B			0.53	8.5320
MYOXOCEPHALUS G			0.53	8.5064
RADULINUS ASPRELLUS			5.82	10.0199
RADULINUS BOLEOIDES	0.53	5.8138		
PSYCHROLUTES PARADOXUS			0.53	8.6631
AGONIDAE			22.75	10.6848
CYCLOPTERIDAE	0.53	6.4727	22.75	10.5971
BATHYMASTER SPP.	10.58	8.0546	52.91	12.2012
STICHAEIDAE	8.99	7.7976	2.12	9.6864
ANOPLARCHUS SPP.			8.47	10.2414

Table 6.--Continued

SPECIES	NEUSTON		BONGO	
	OCCUR. %	LOG NO. IN AREA	OCCUR. %	LOG NO. IN AREA
LUMPENELLA LONGIROSTRIS			1.06	8.9179
LUMPENUS SPP.			0.53	8.4387
LUMPENUS SAGITTA			1.06	9.3286
LUMPENUS MACULATUS			8.47	10.1735
POROCLINUS ROTHROCKI			6.35	10.0997
STICHAEUS PUNCTATUS			0.53	9.1097
DELOLEPIS GIGANTEA	3.17	7.1468	1.06	8.8713
LYCONNECTES ALEUTENSIS	34.92	9.4557	6.88	10.0719
ZAPRORA SILENUS	6.88	7.9015	4.76	10.1455
AMMODYTES HEXAPTERUS	28.04	9.9559	67.72	11.7838
ATHERESTHES STOMIAS			41.80	11.5144
GLYPTOCEPHALUS ZACHIRUS	2.65	7.2836	23.28	10.9861
HIPPOGLOSSOIDES ELASSODON	3.70	7.2197	52.91	11.6670
HIPPOGLOSSUS STENOLEPIS	5.82	7.7775	11.64	10.4507
ISOPSETTA ISOLEPIS			0.53	9.3180
LEPIDOPSETTA BILINEATA	0.53	6.5186	27.51	10.9458
LYOPSETTA EXILIS			0.53	8.8189
MICROSTOMUS PACIFICUS	0.53	6.5246	1.06	9.5104
PAROPHRYS VETULUS	0.53	6.0973		
PLATICHTHYS STELLATUS	1.06	6.5806	4.76	10.0211
PLEURONECTES QUADRITUBERCULATUS			1.59	9.0732
PSETTICHTHYS 2	1.06	6.5314	8.99	10.3914
REINHARDTIUS HIPPOGLOSSOIDES	7.94	7.9953		

Table 7.--Fish juveniles collected in bongo and neuston tows during cruise 2P085,
May-June 1985.

SPECIES	NEUSTON		BONGO	
	OCCUR. %	LOG NO. IN AREA	OCCUR. %	LOG NO. IN AREA
ONCORHYNCHUS GORBUSCHA	0.53	5.7131		
MALLOTUS VILLOSUS	0.53	6.2374		
LEUROGLOSSUS SCHMIDTI			0.53	8.9420
CHAULIODUS MACOUNI			0.53	9.1128
STENOBRACHIUS LEUCOPSARUS			12.17	10.8504
STENOBRACHIUS NANNOCHIR			1.06	9.6791
PROTOMYCTOPHUM THOMPSONI			0.53	9.2308
GASTEROSTEUS ACULEATUS	1.06	6.3941		
HEXAGRAMMOS STELLERI	1.59	6.4166		
AMMODYTES HEXAPTERUS	0.53	7.1328		

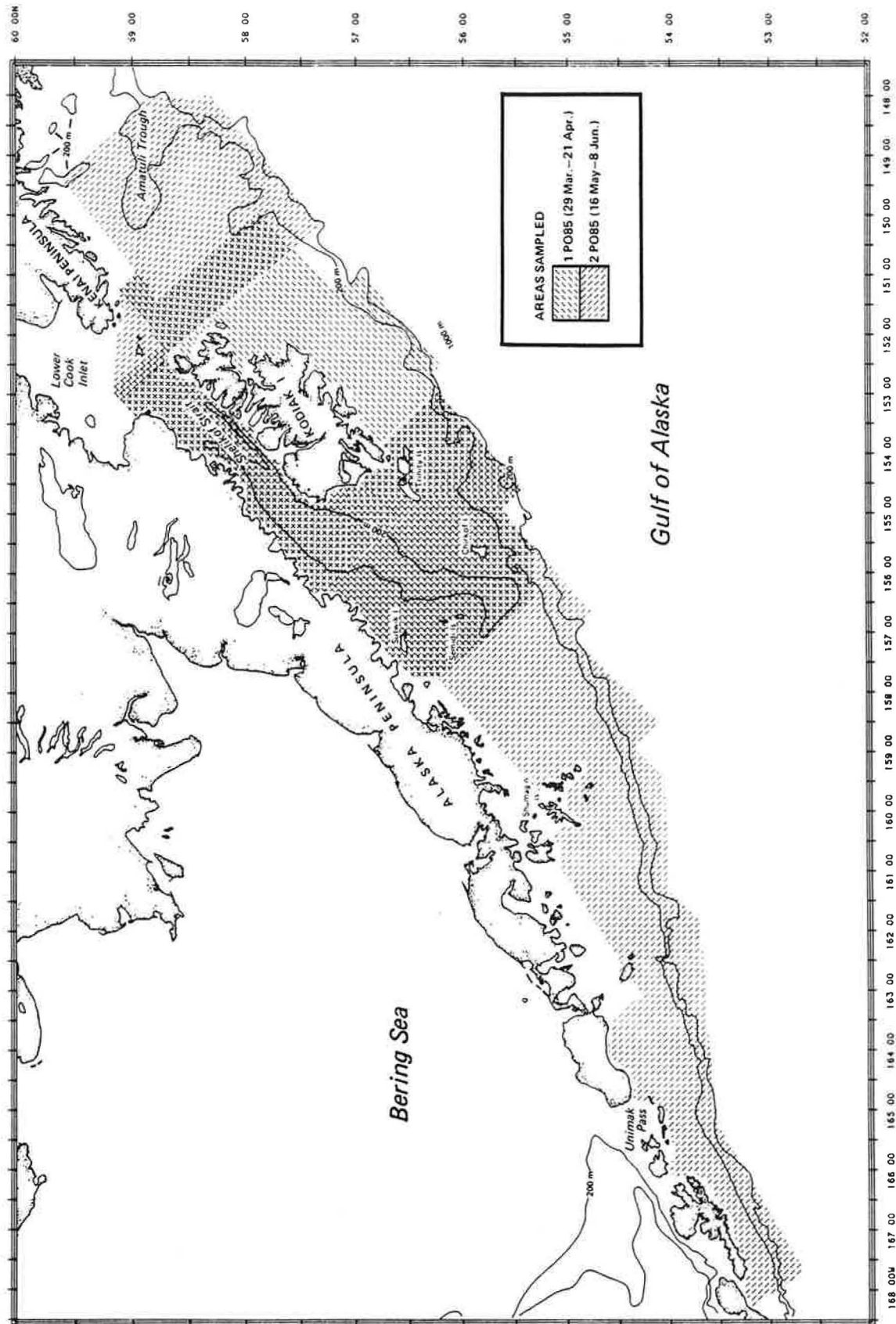


Figure 1.--Geography and bathymetry of the northwestern Gulf of Alaska.
The areas surveyed during 1P085 and 2P085 are outlined.

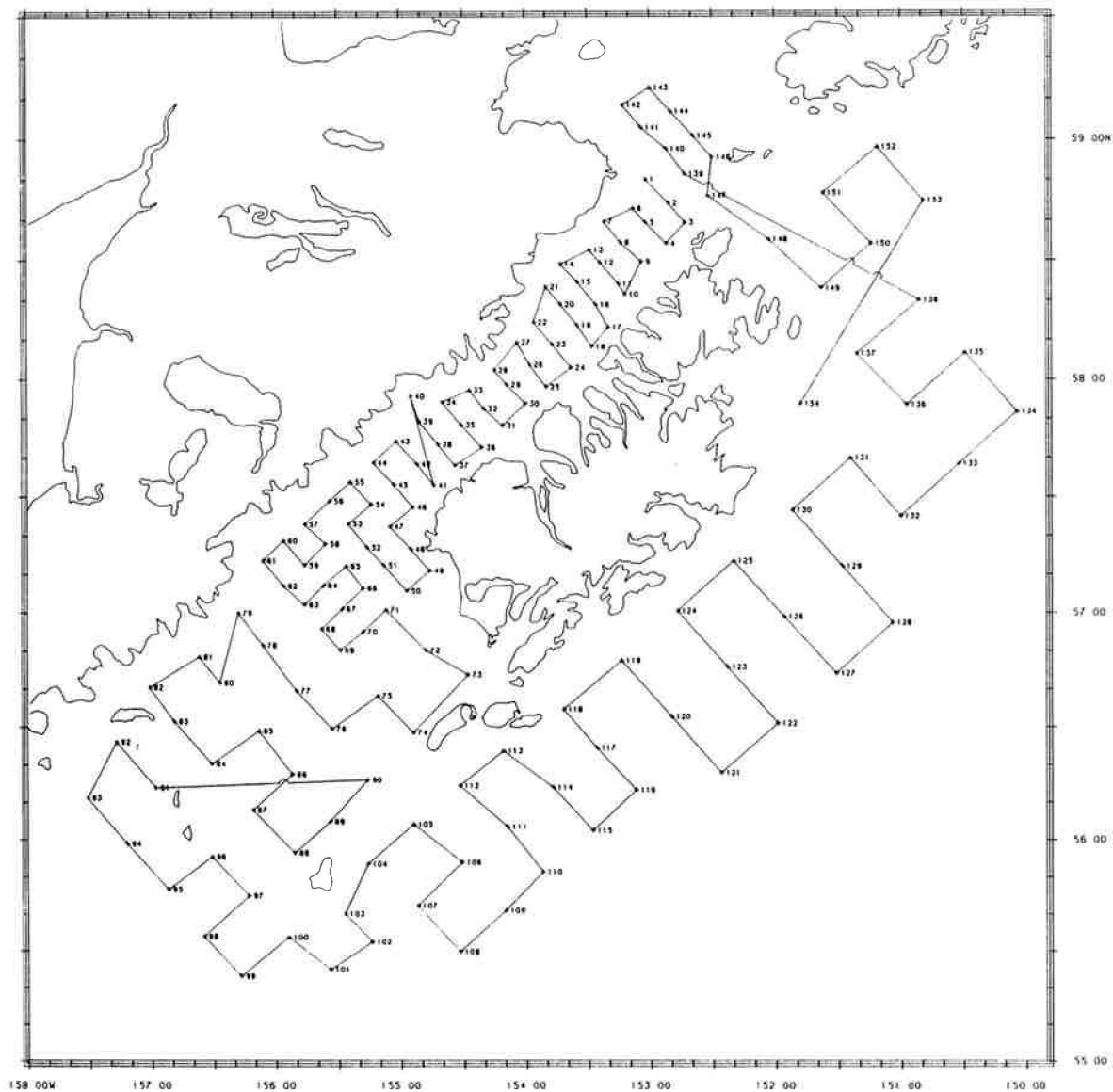


Figure 2.--Station locations and cruise track for cruise 1P085, March-April 1985.

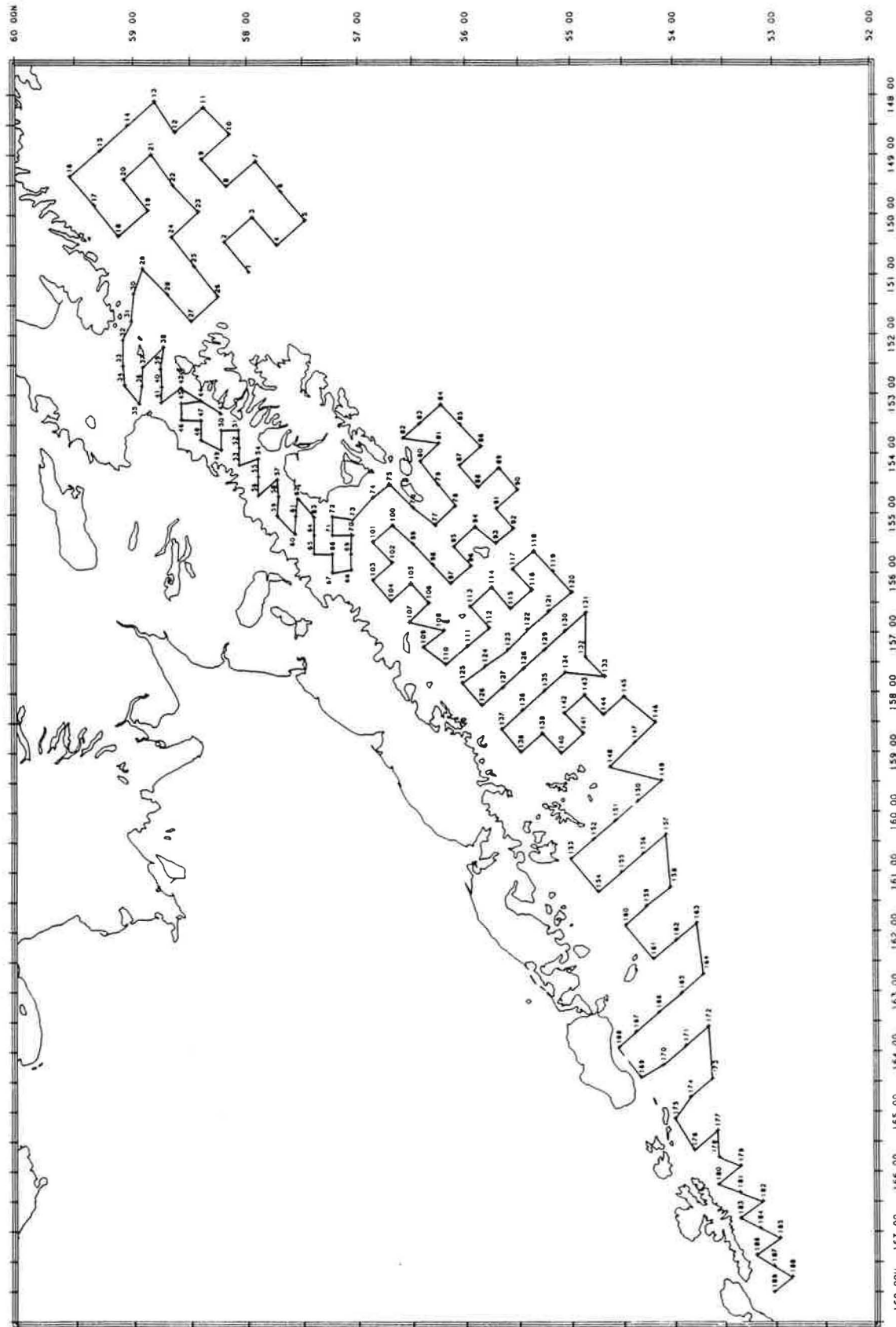


Figure 3.--Station locations and cruise track for cruise 2P085, May-June 1985.

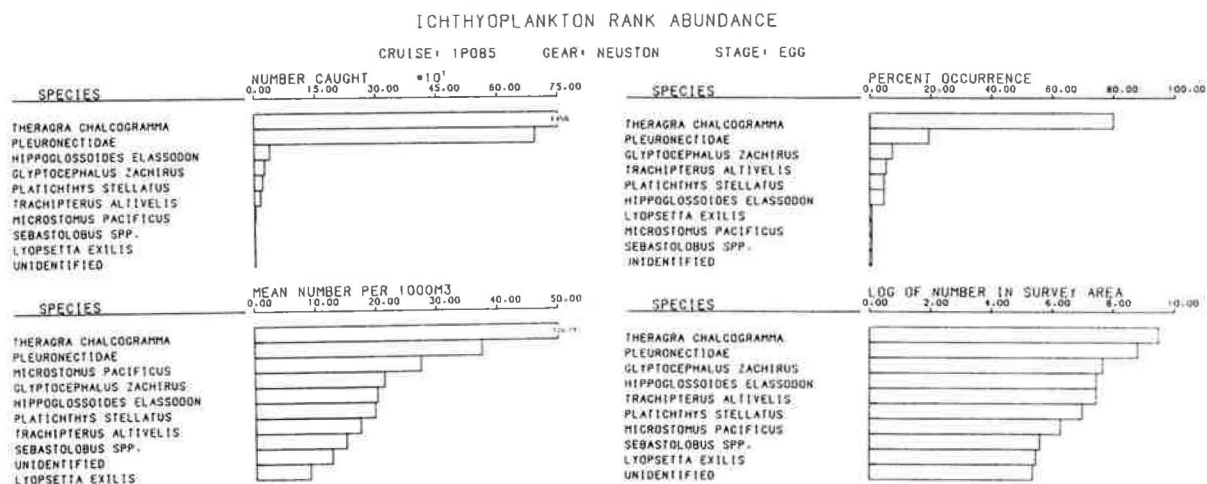


Figure 4.--Rank abundance of fish eggs caught in neuston tows during cruise 1P085, March-April 1985.

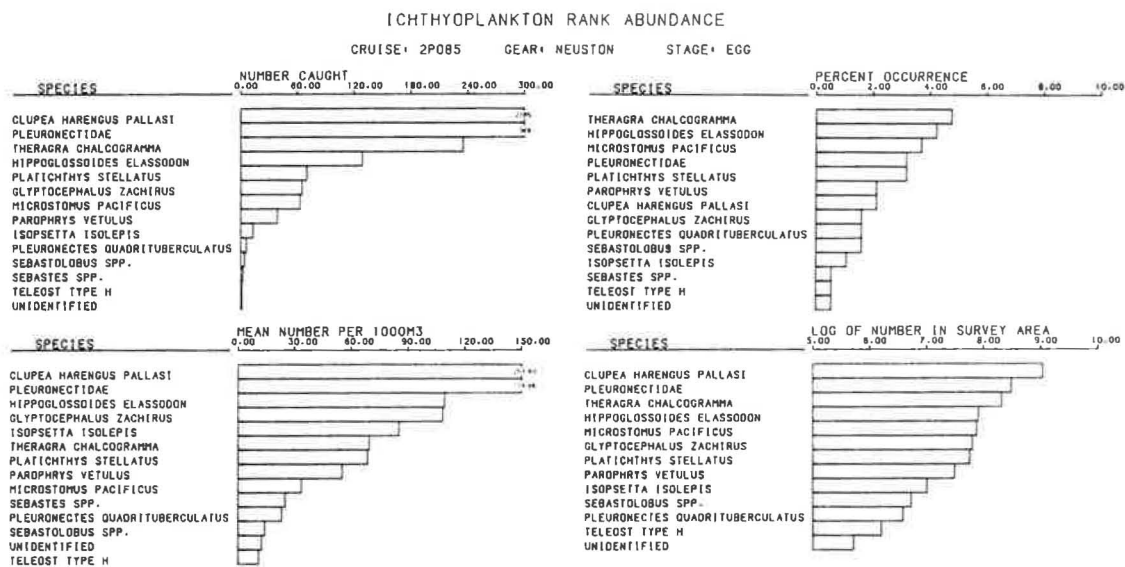


Figure 5.--Rank abundance of fish eggs caught in neuston tows during cruise 2P085, May-June 1985.

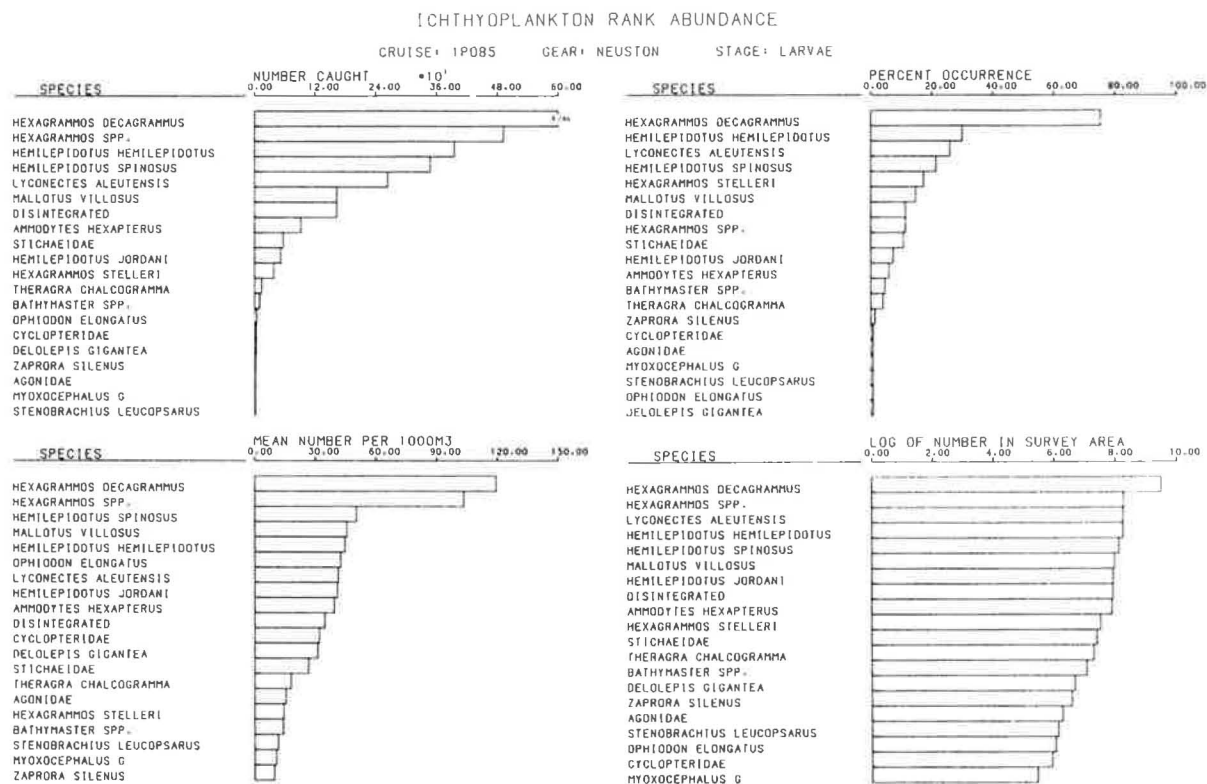


Figure 6.--Rank abundance of fish larvae caught in neuston tows during cruise 1P085, March-April 1985.

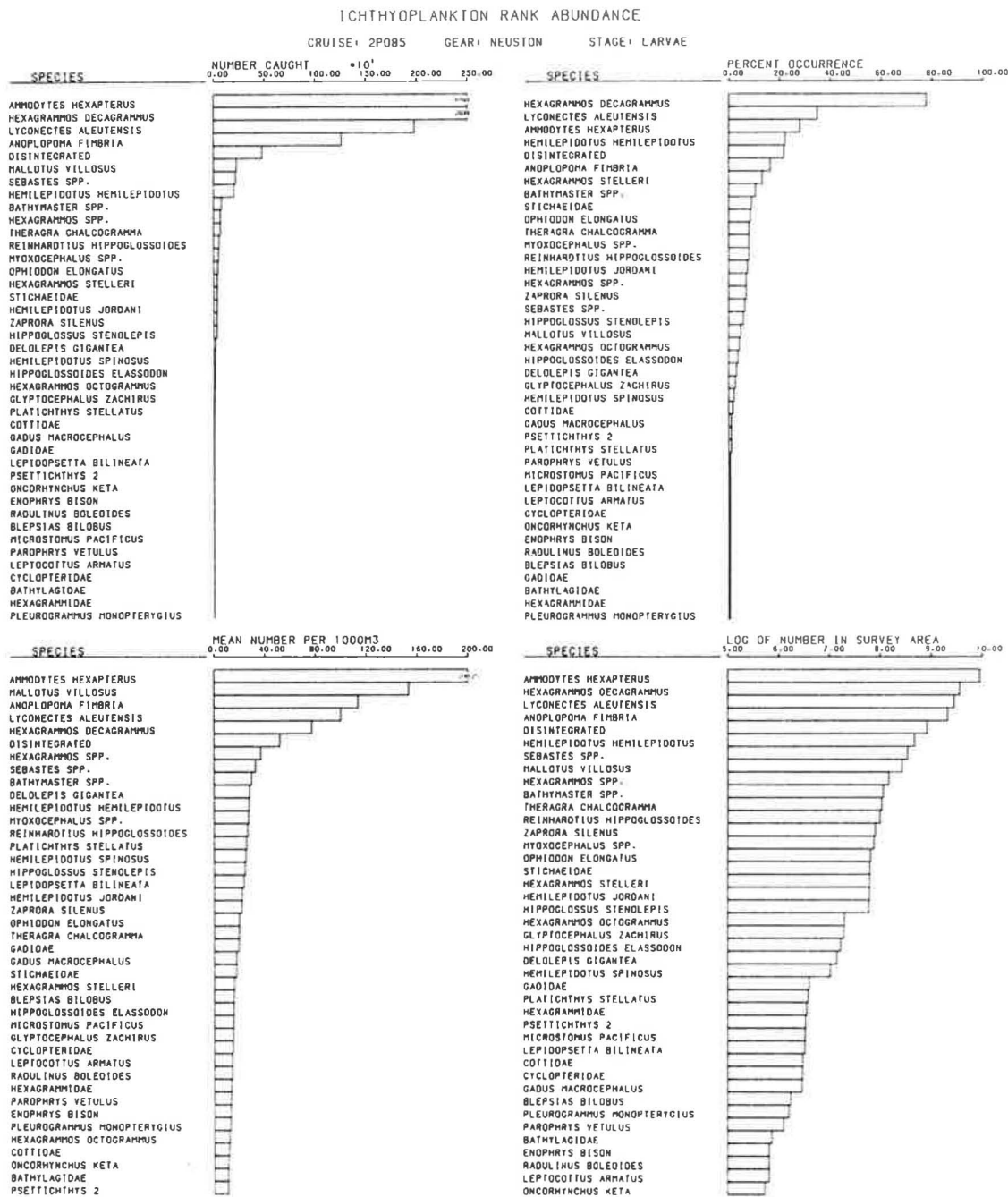


Figure 7.--Rank abundance of fish larvae caught in neuston tows during cruise 2P085, May-June 1985.

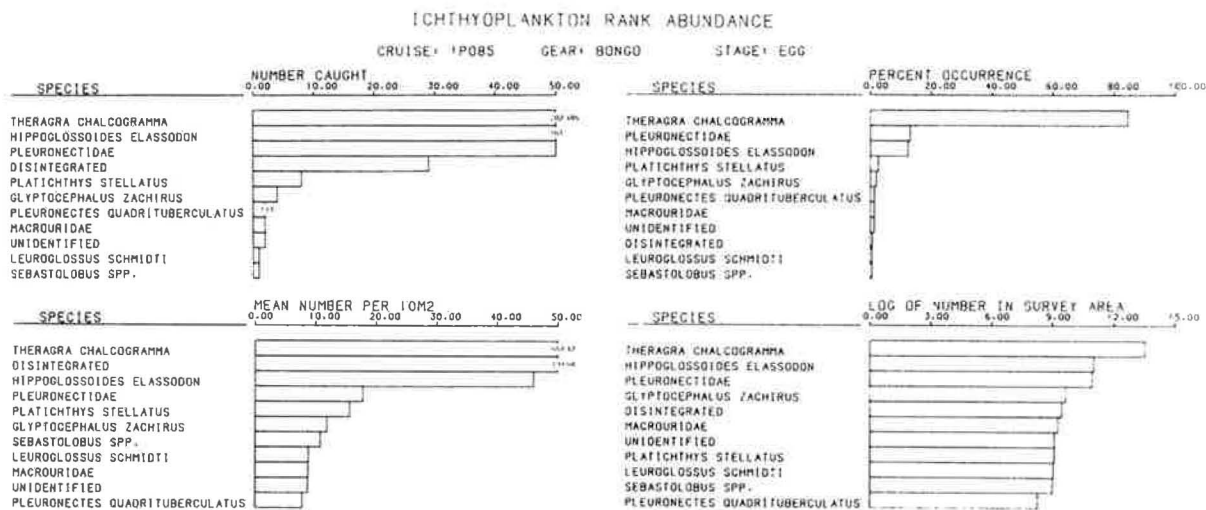


Figure 8.--Rank abundance of fish eggs caught in bongo tows during cruise 1P085, March-April 1985.

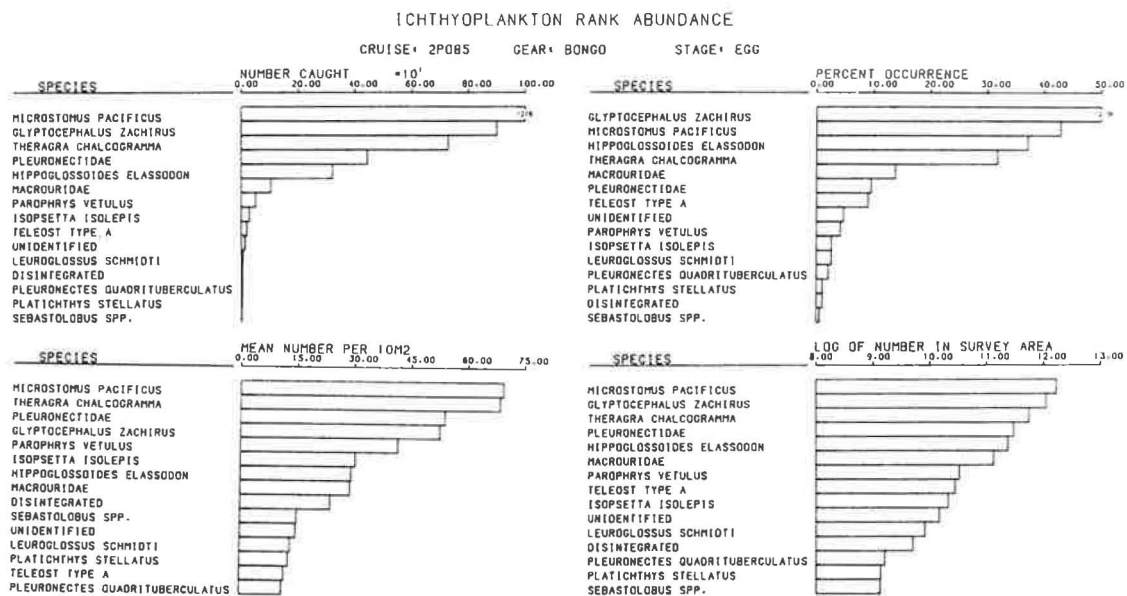


Figure 9.--Rank abundance of fish eggs caught in bongo tows during cruise 2P085, May-June 1985.

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CRUISE: 1P085 GEAR: BONGO STAGE: LARVAE



Figure 10.--Rank abundance of fish larvae caught in bongo tows during cruise 1P085, March-April 1985.

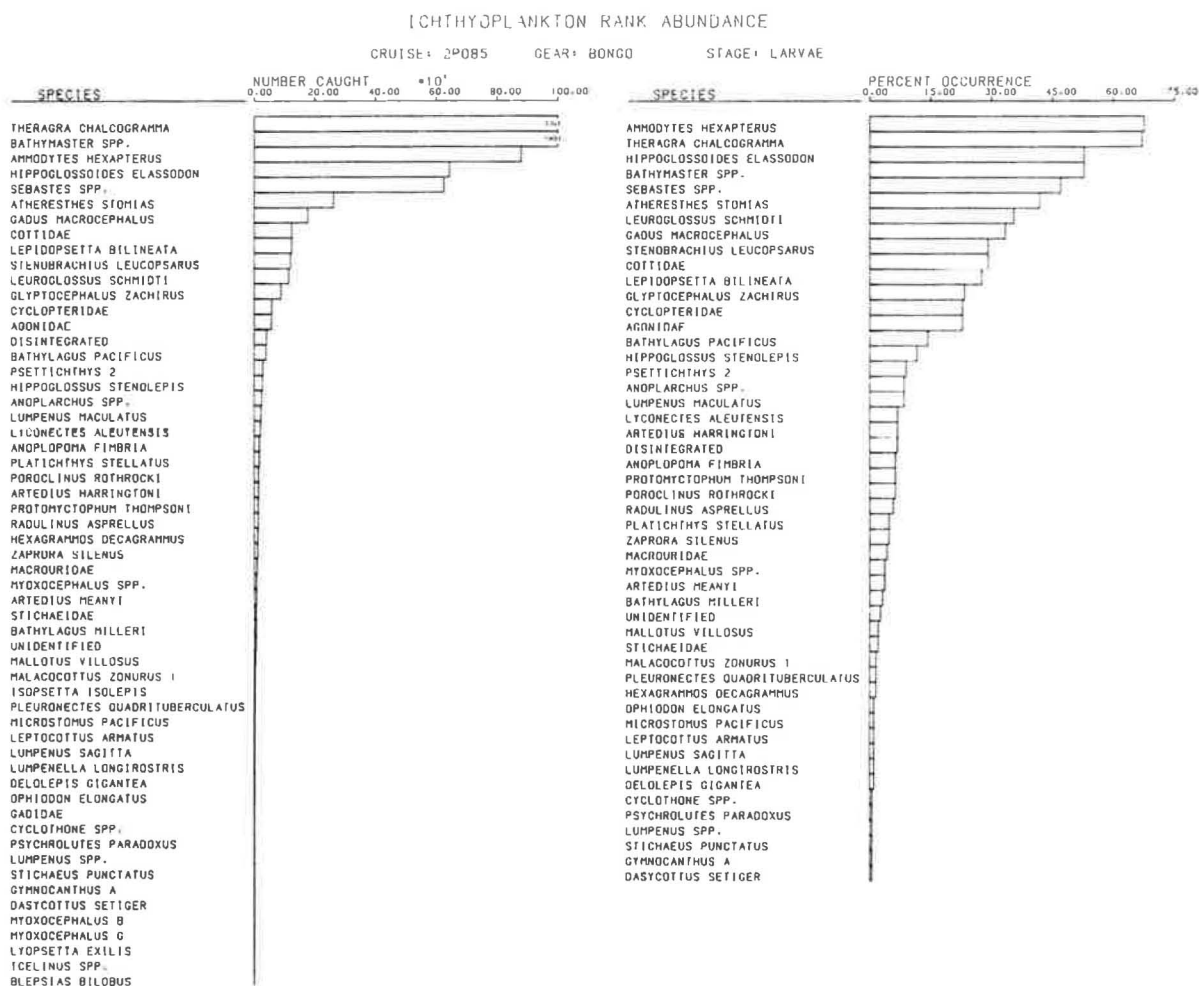


Figure 11.--Rank abundance of fish larvae caught in bongo tows during cruise 2P085, May-June 1985.

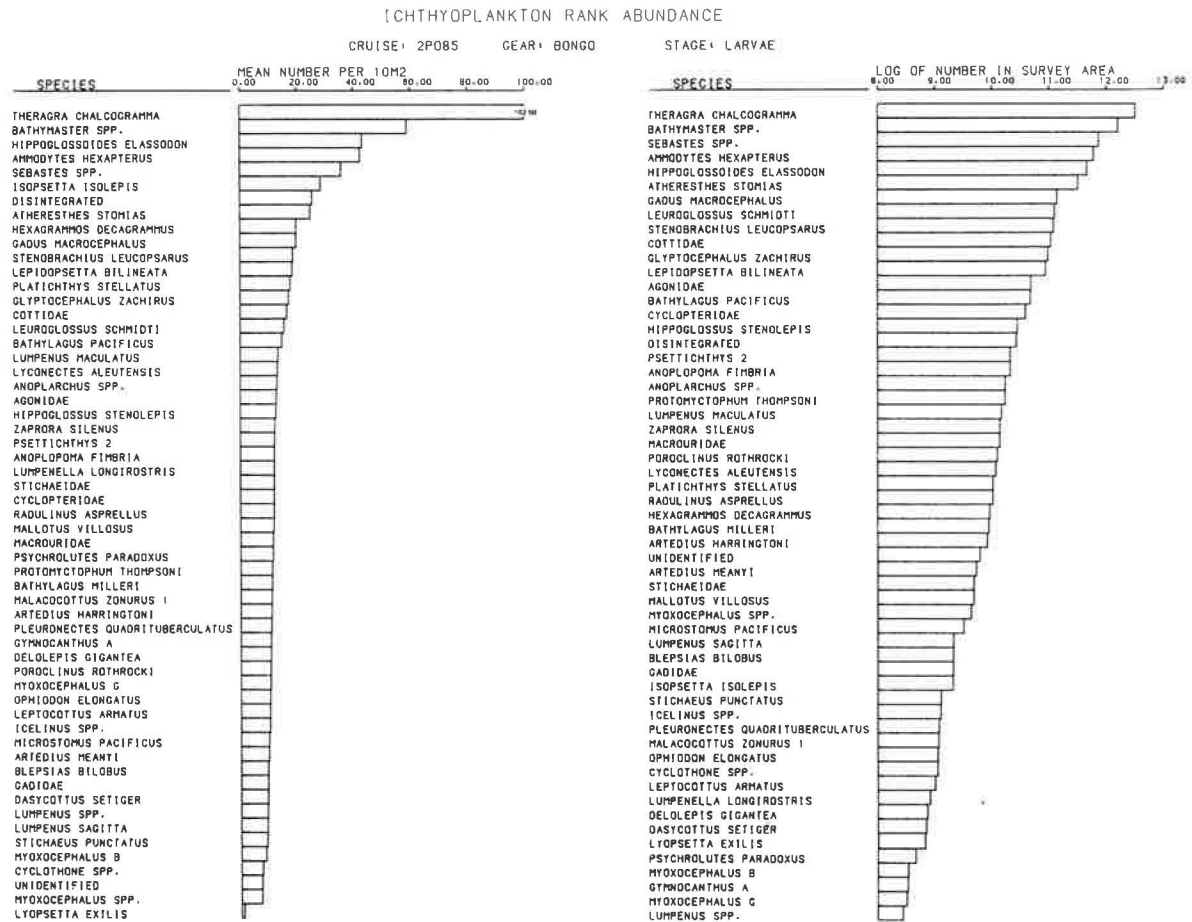


Figure 11.--Continued

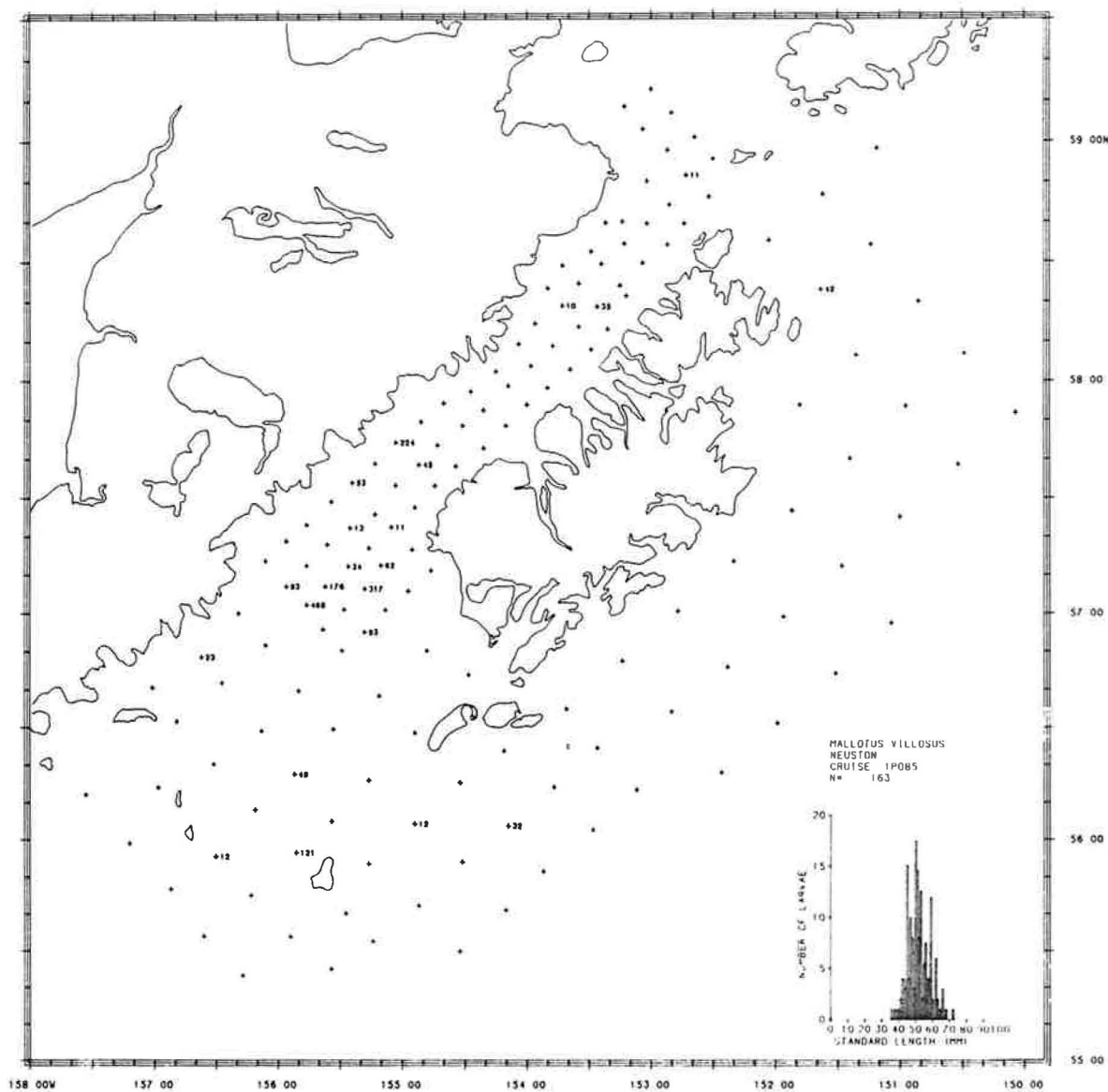


Figure 12.--Distribution and size frequency distribution of larvae of *Mallotus villosus* from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

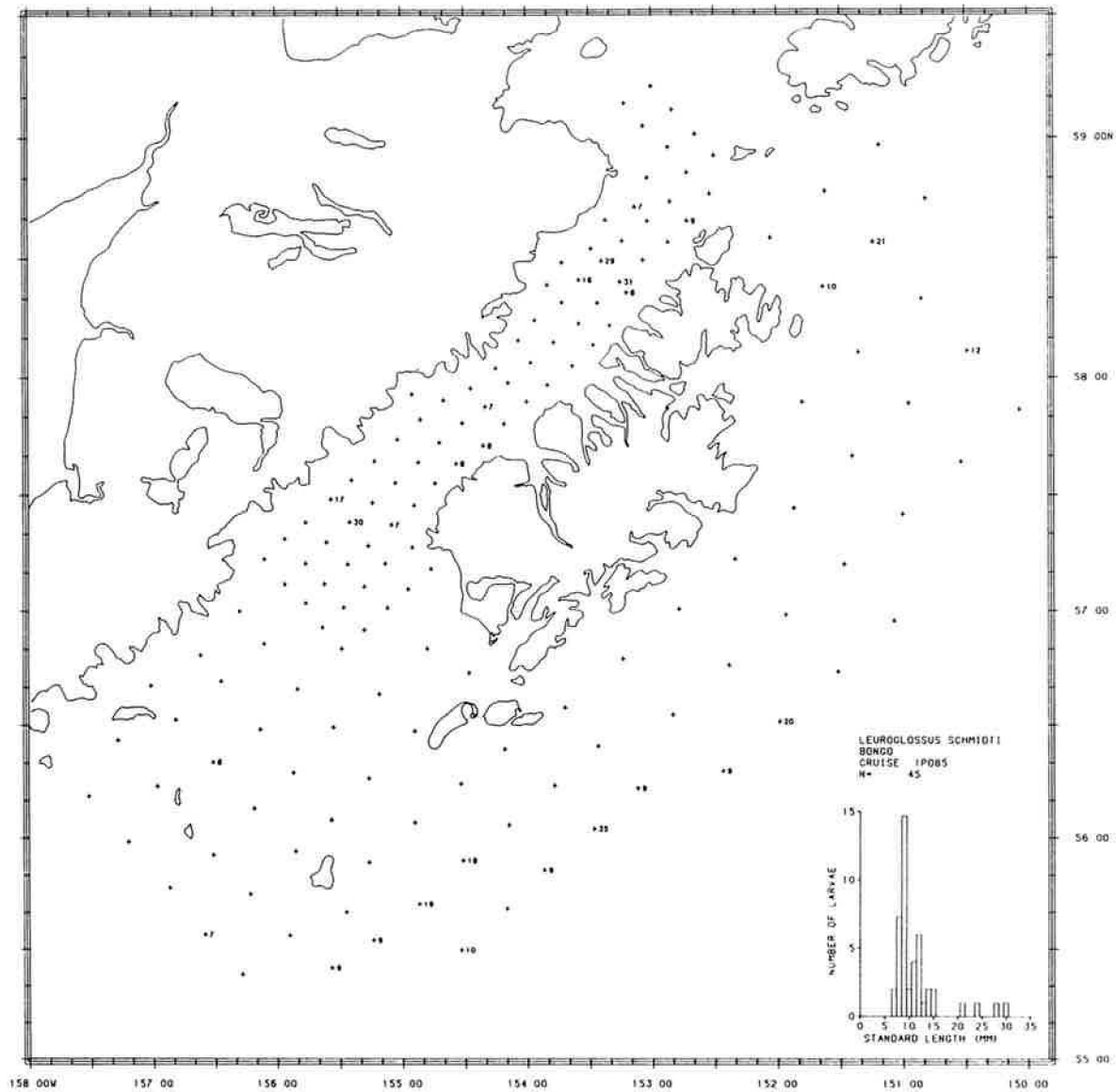


Figure 13.--Distribution and size frequency distribution of larvae of *Leuroglossus schmidtii* from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

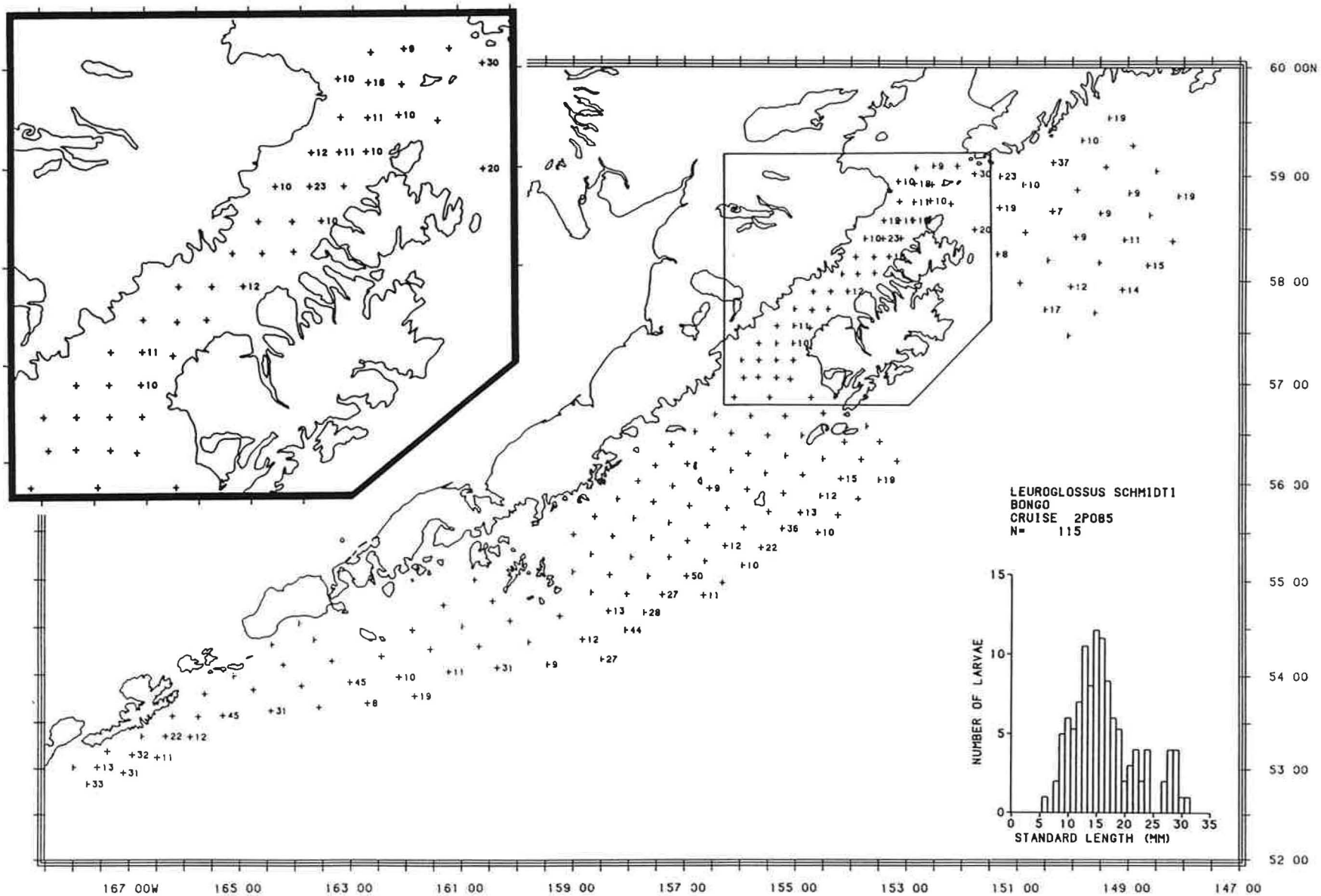


Figure 14.--Distribution and size frequency distribution of larvae of Leuroglossus schmidtii from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

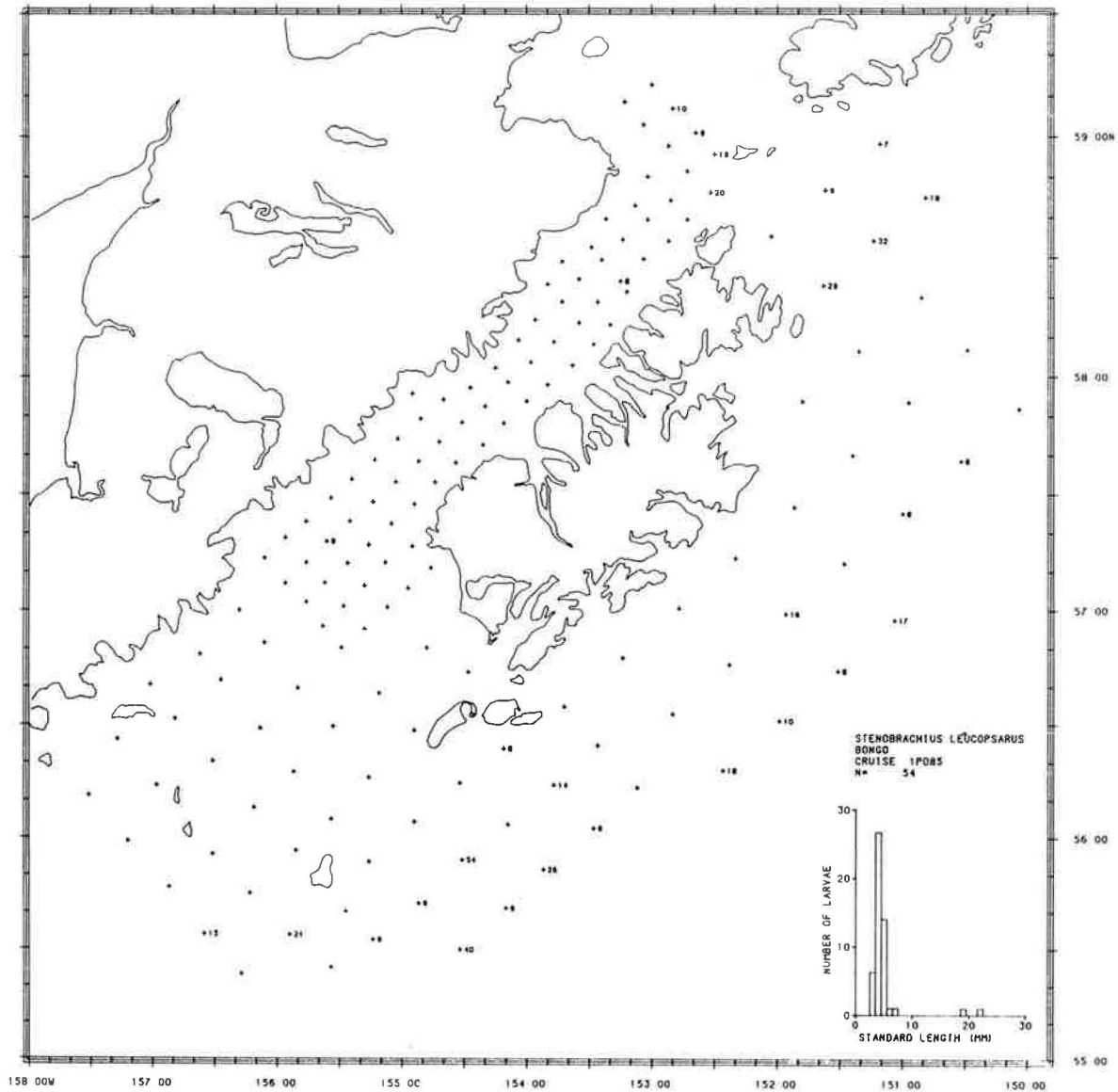


Figure 15.--Distribution and size frequency distribution of larvae of Stenobranchius leucopsarus from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

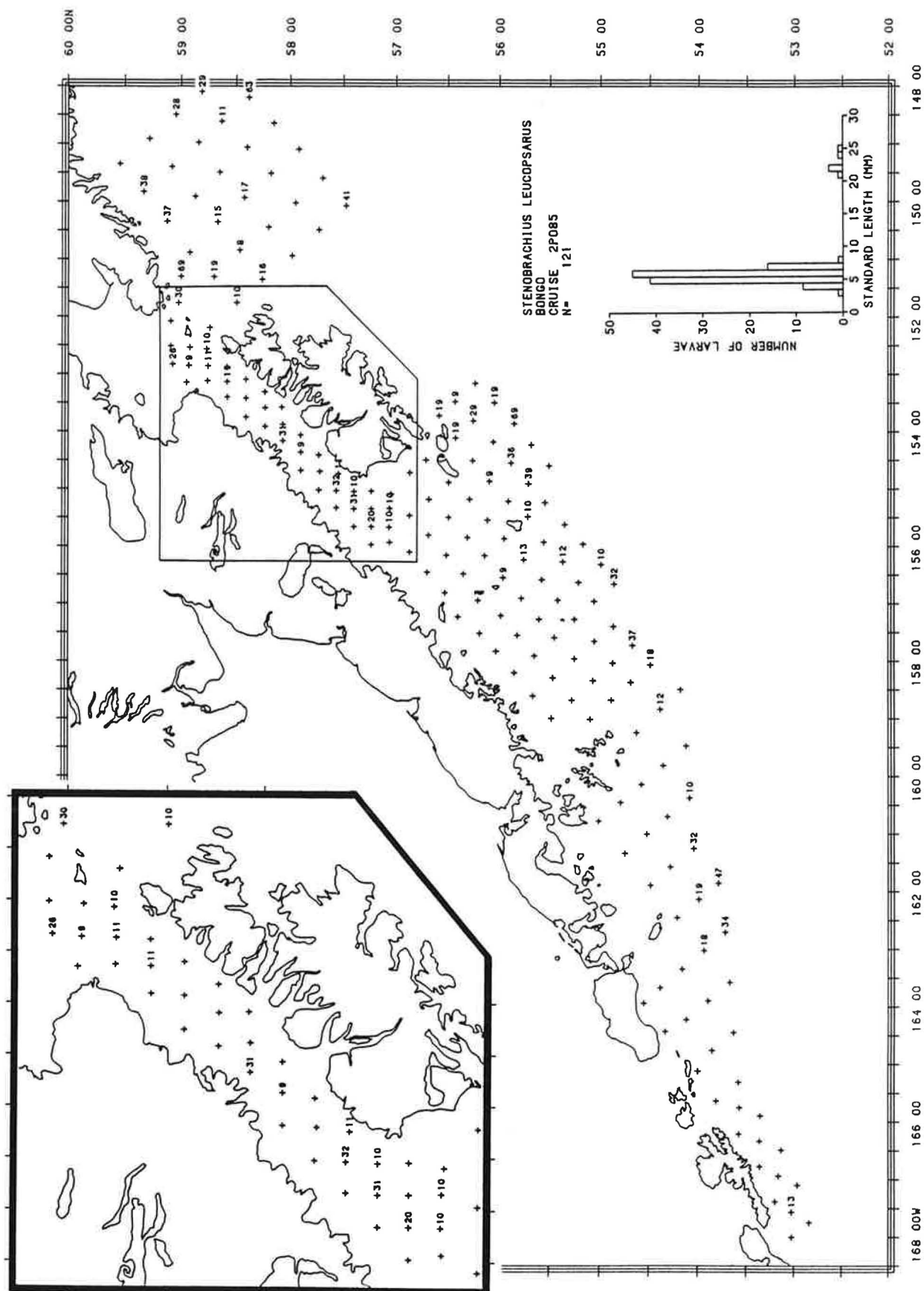


Figure 16.--Distribution and size frequency distribution of larvae of *Stenobranchius leucopsarus* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

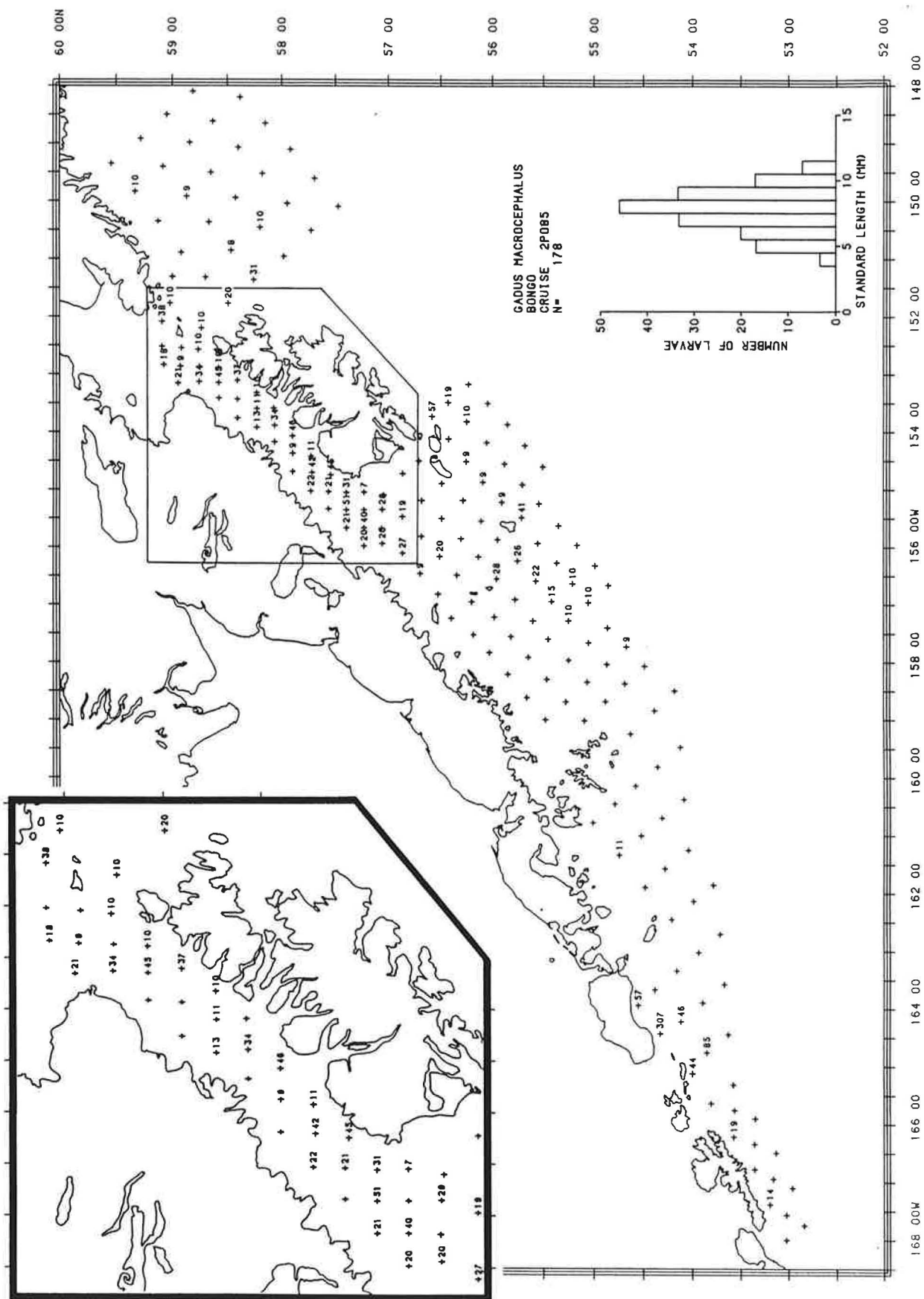


Figure 17.--Distribution and size frequency distribution of larvae of *Gadus macrocephalus* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

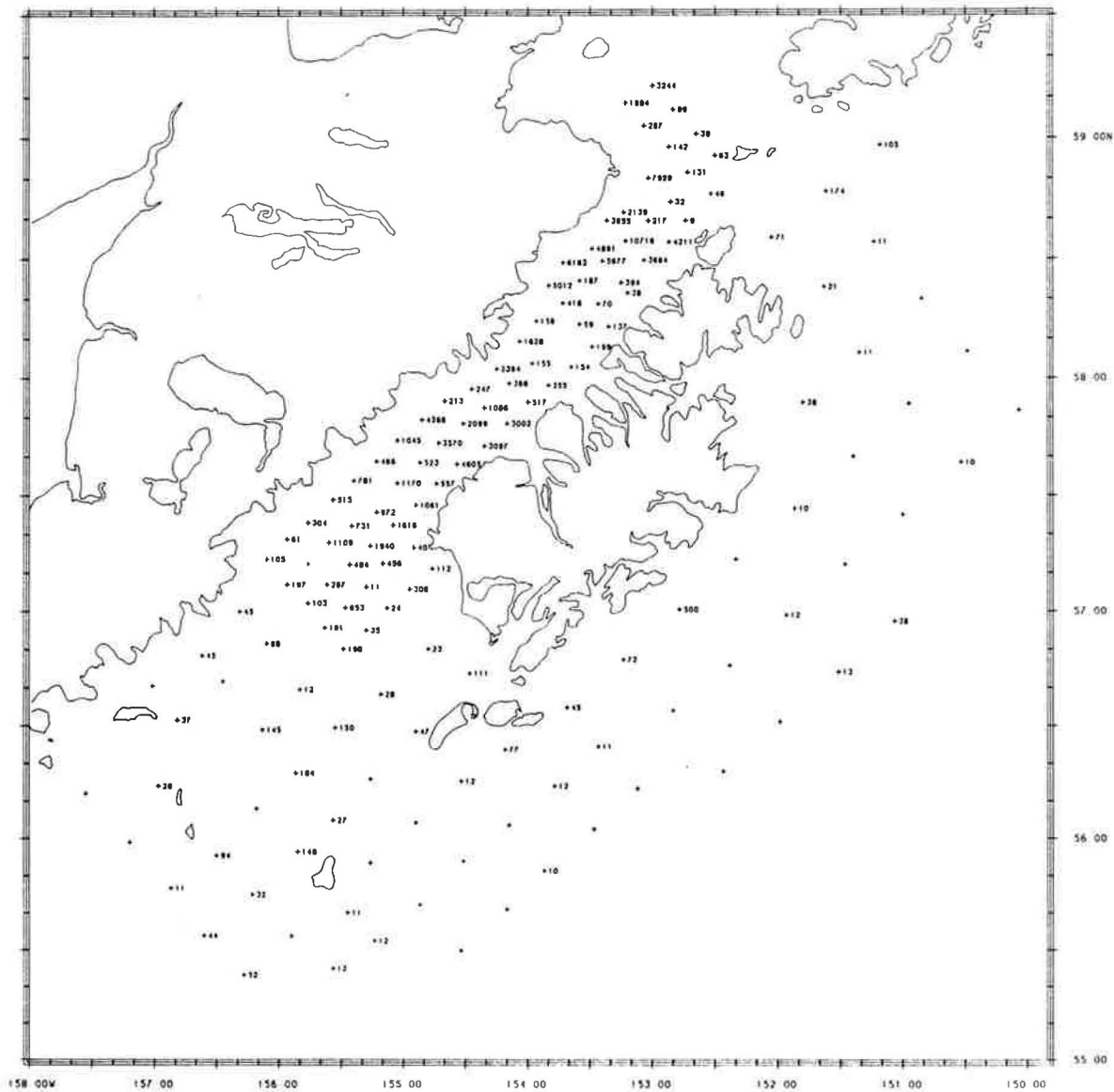


Figure 18.--Distribution of eggs of *Theragra chalcogramma* from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

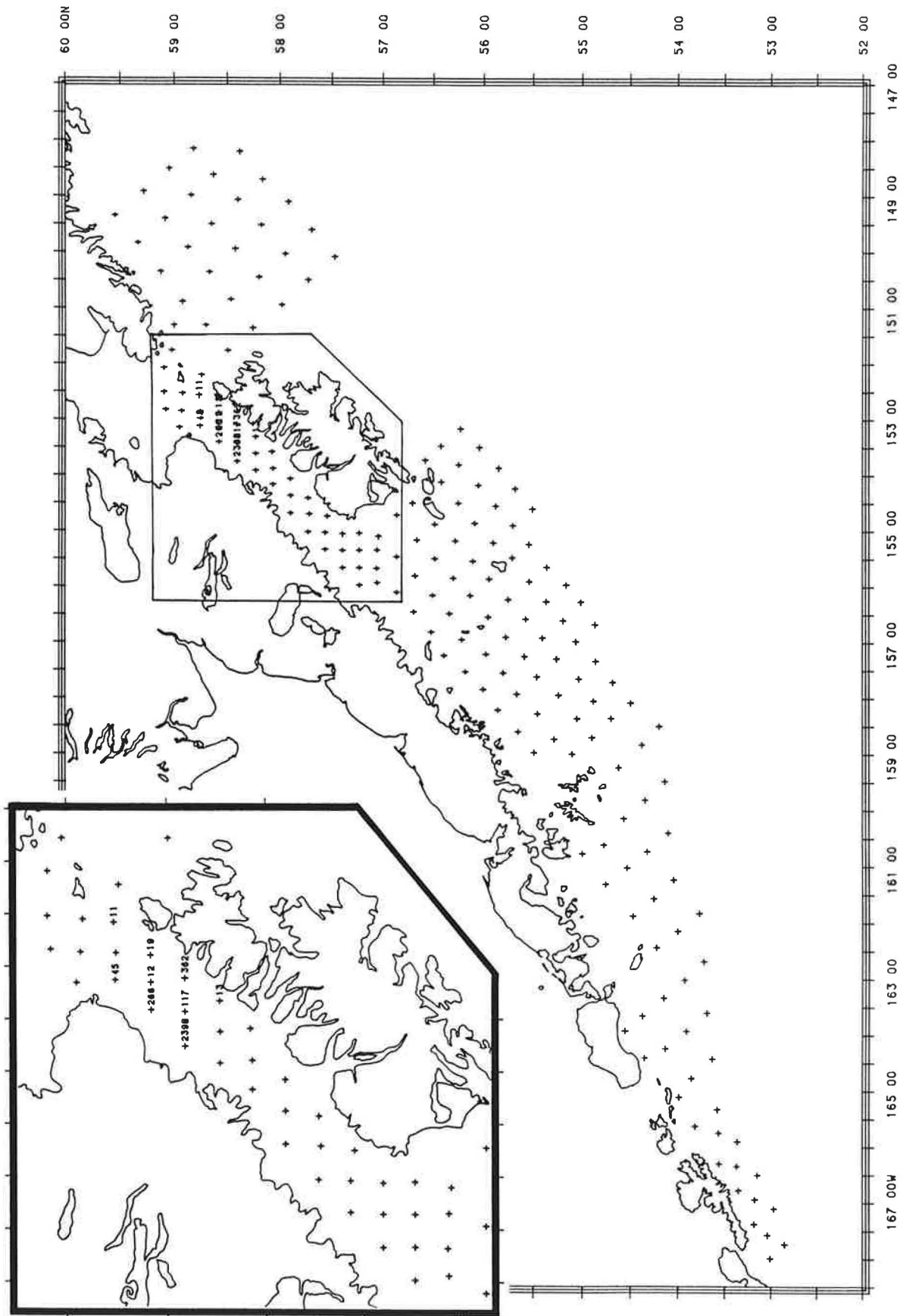


Figure 19.--Distribution of eggs of *Theragra chalcogramma* from neuston tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 1000 m³.

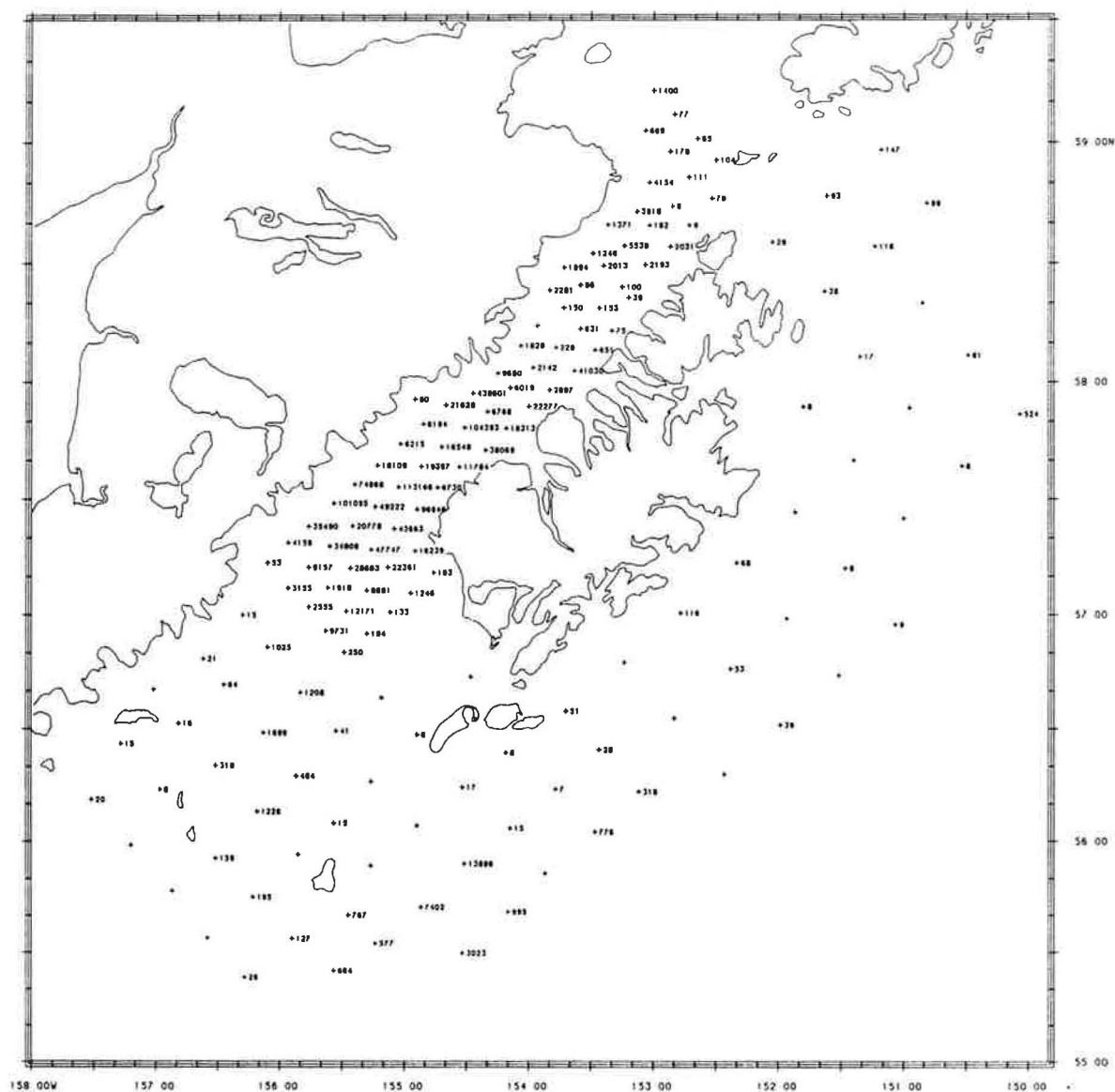


Figure 20.--Distribution of eggs of *Theragra chalcogramma* from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

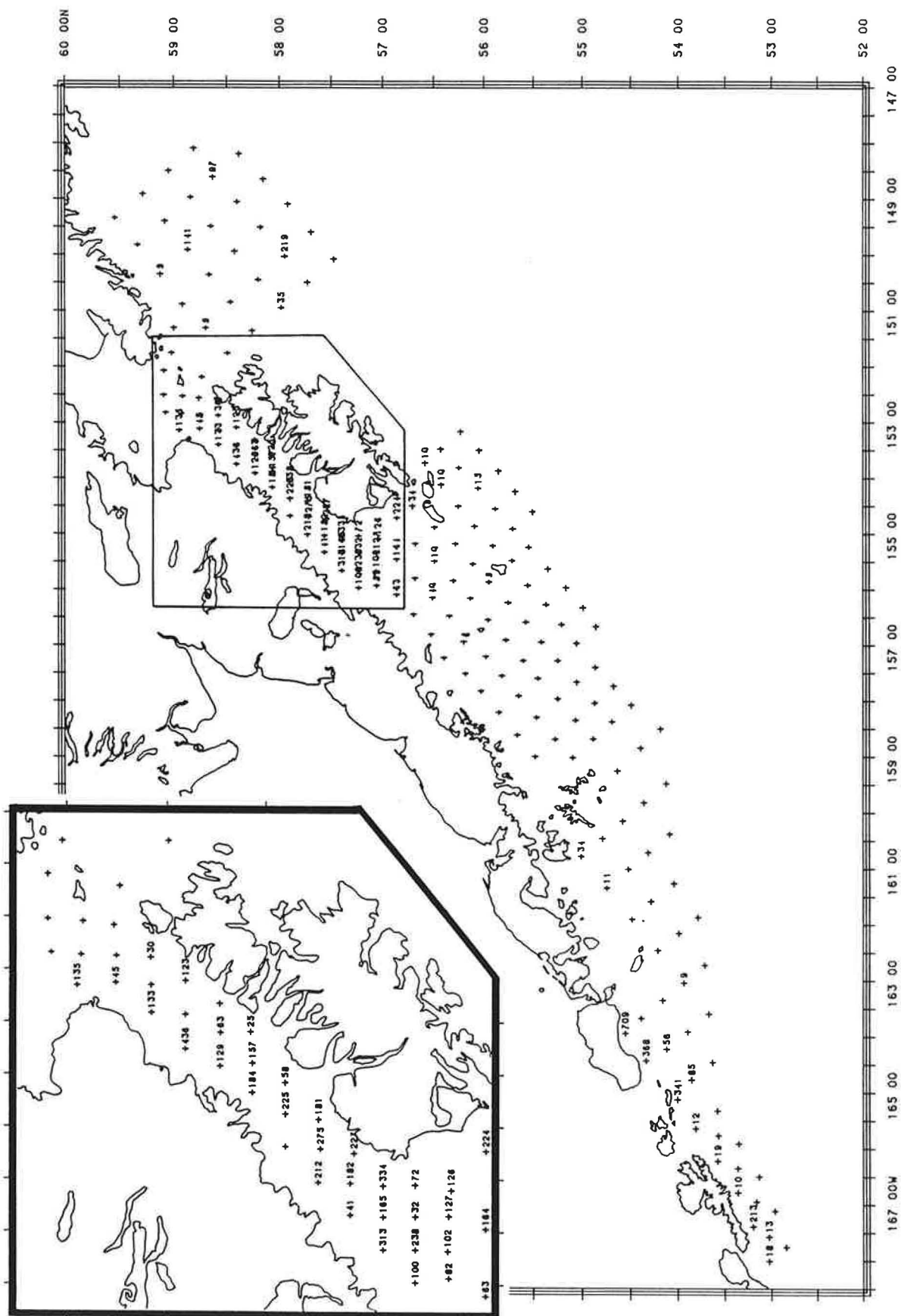


Figure 21.--Distribution of eggs of *Theragra chalcogramma* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10m².

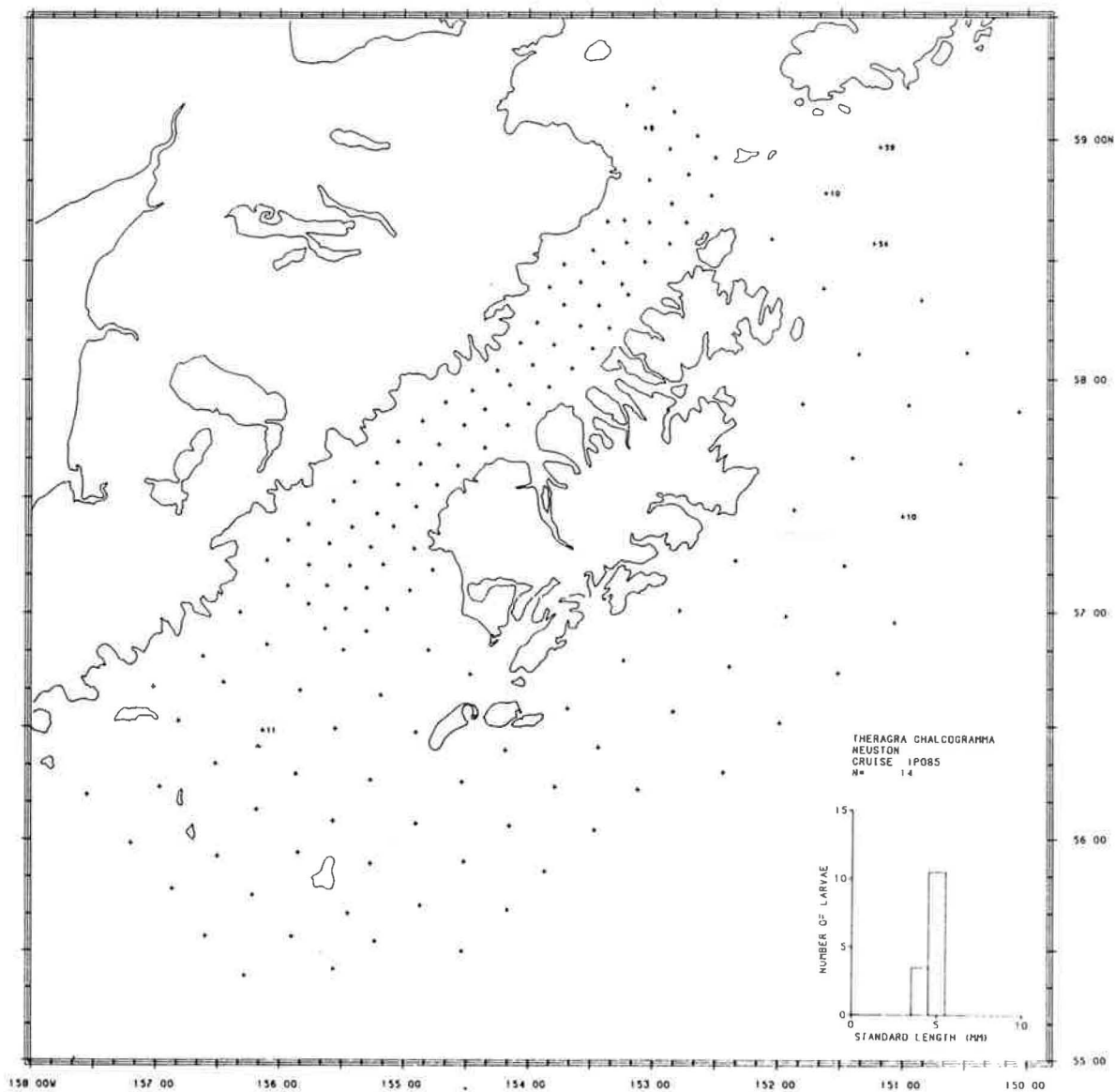


Figure 22.--Distribution and size frequency distribution of larvae of *Theragra chalcogramma* from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

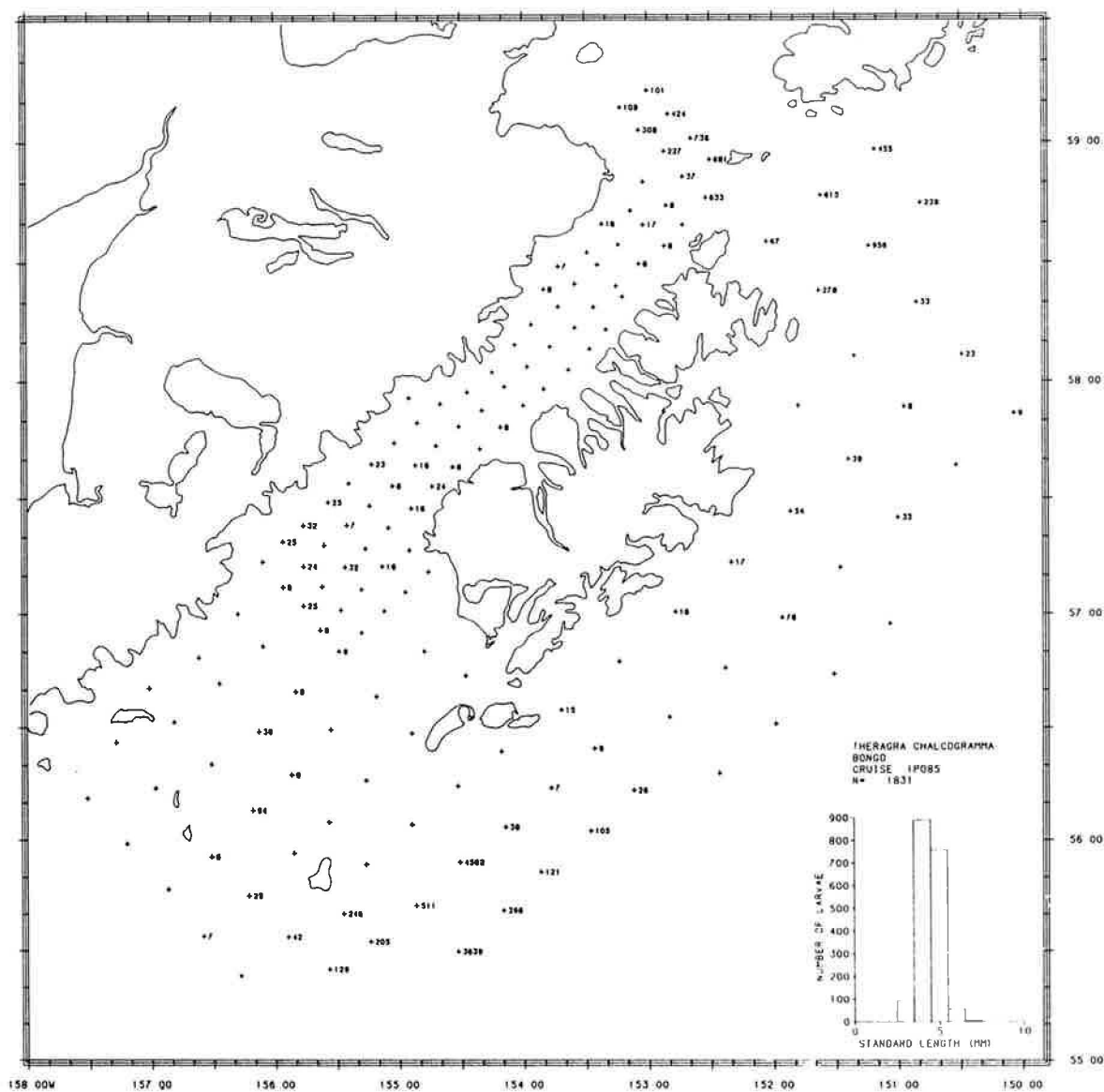
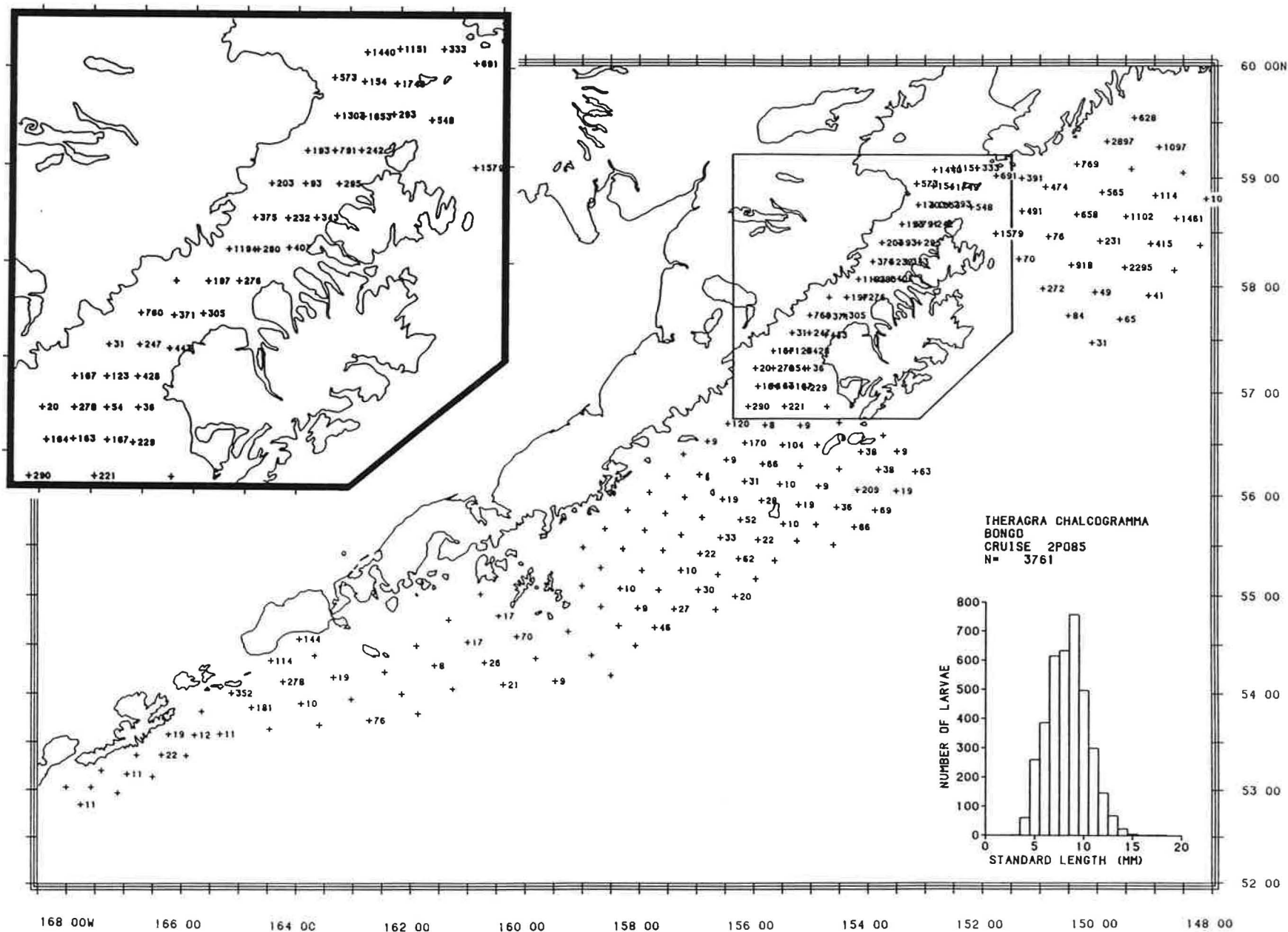


Figure 23.--Distribution and size frequency distribution of larvae of *Theragra chalcogramma* from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

Figure 24.--Distribution and size frequency distribution of larvae of *Theragra chalcogramma* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².



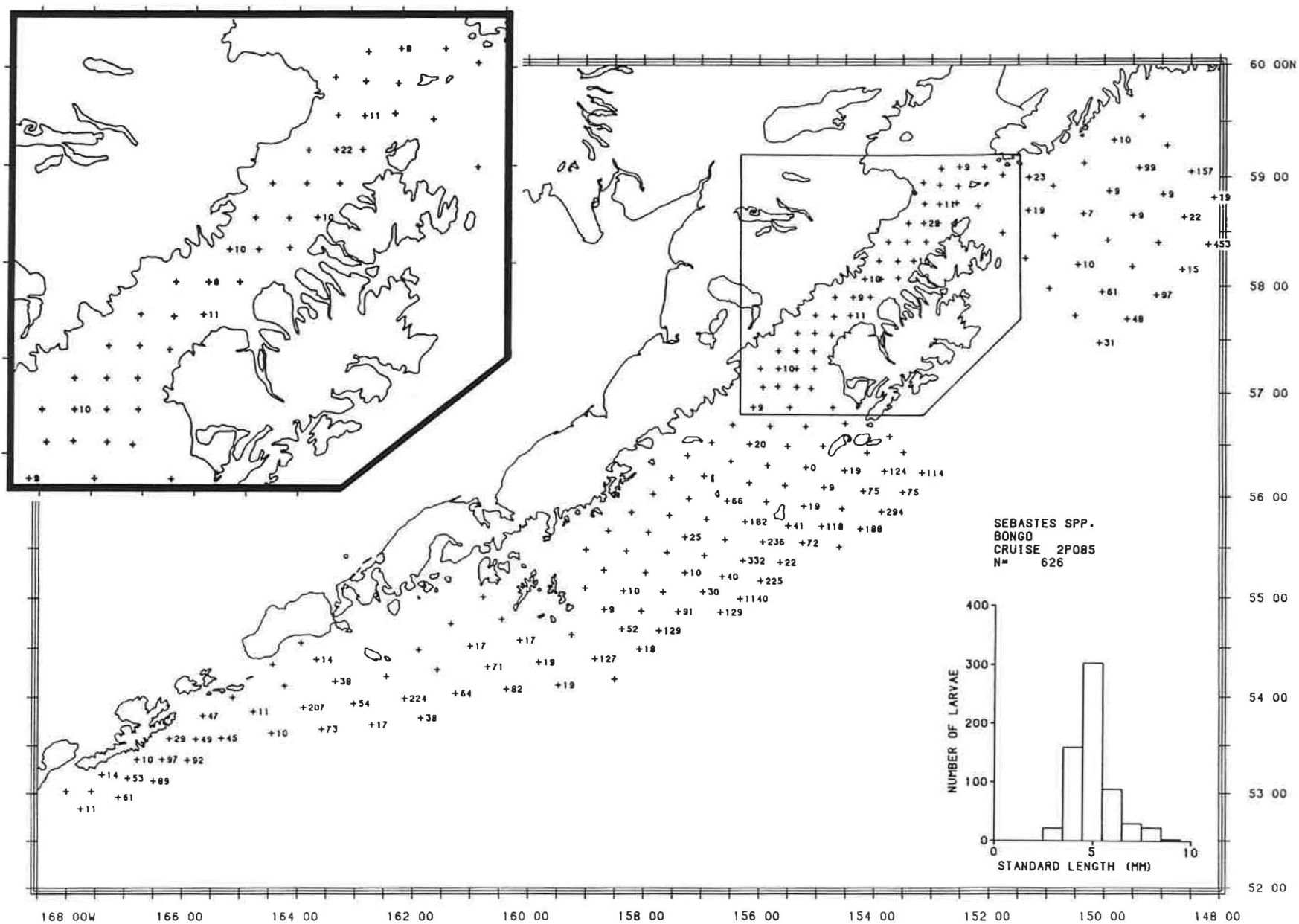


Figure 25.--Distribution and size frequency distribution of larvae of *Sebastes* spp. from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

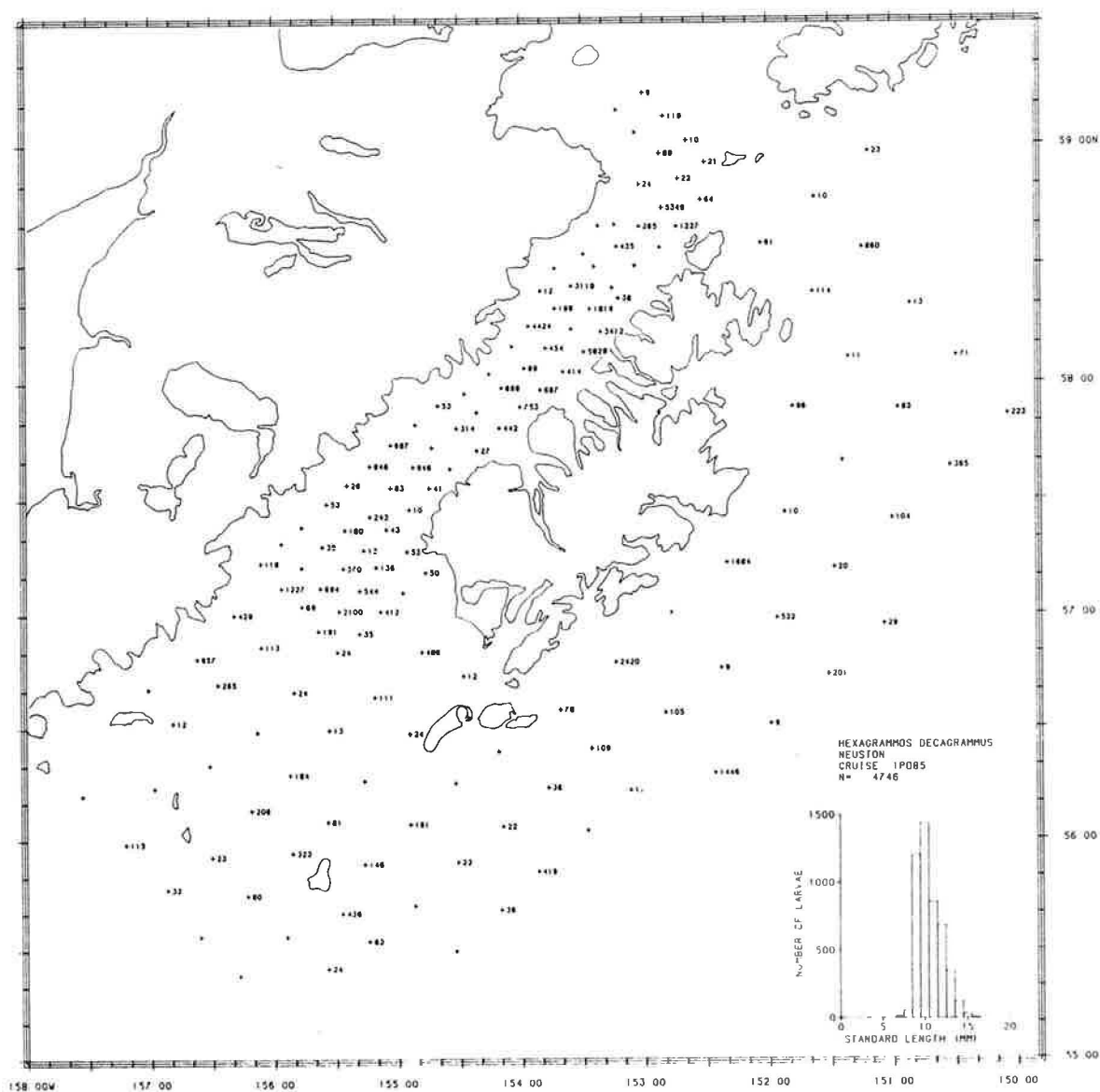
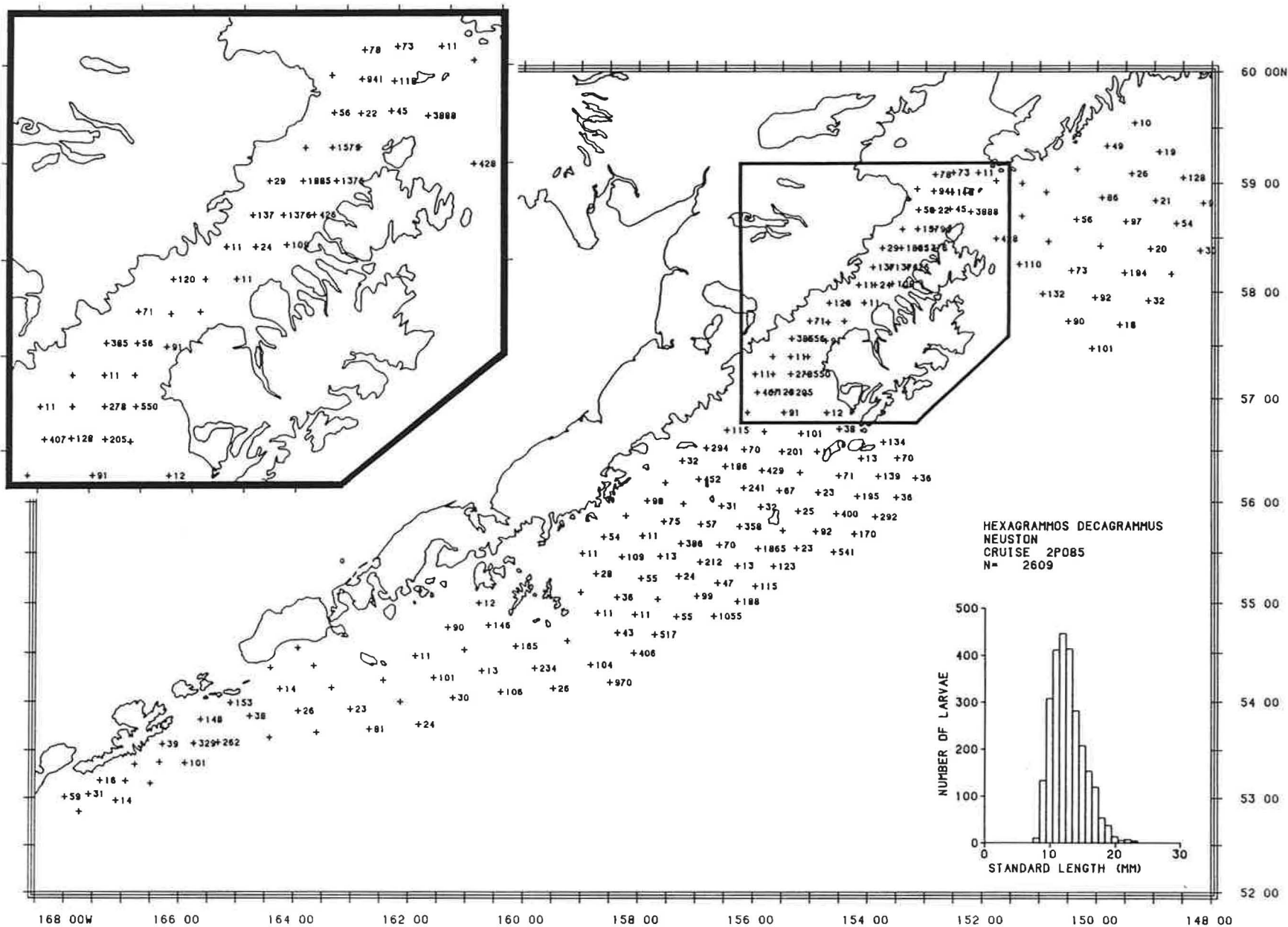


Figure 26.--Distribution and size frequency distribution of larvae of *Hexagrammos decagrammus* from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 27.--Distribution and size frequency distribution of larvae of Hexagrammos decagrammus from neuston tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 1000 m³.



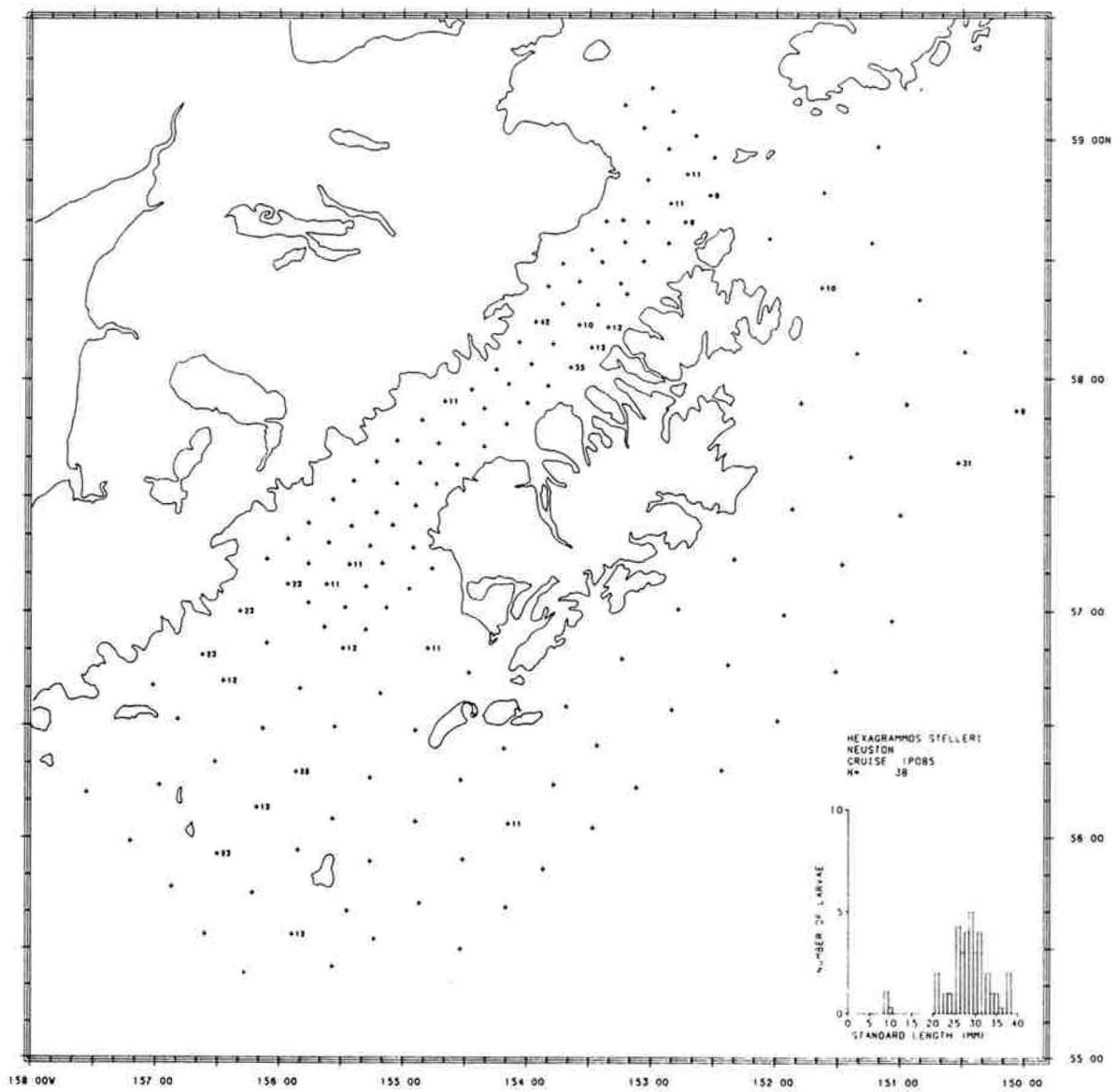


Figure 28.--Distribution and size frequency distribution of larvae of Hexagrammos stelleri from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

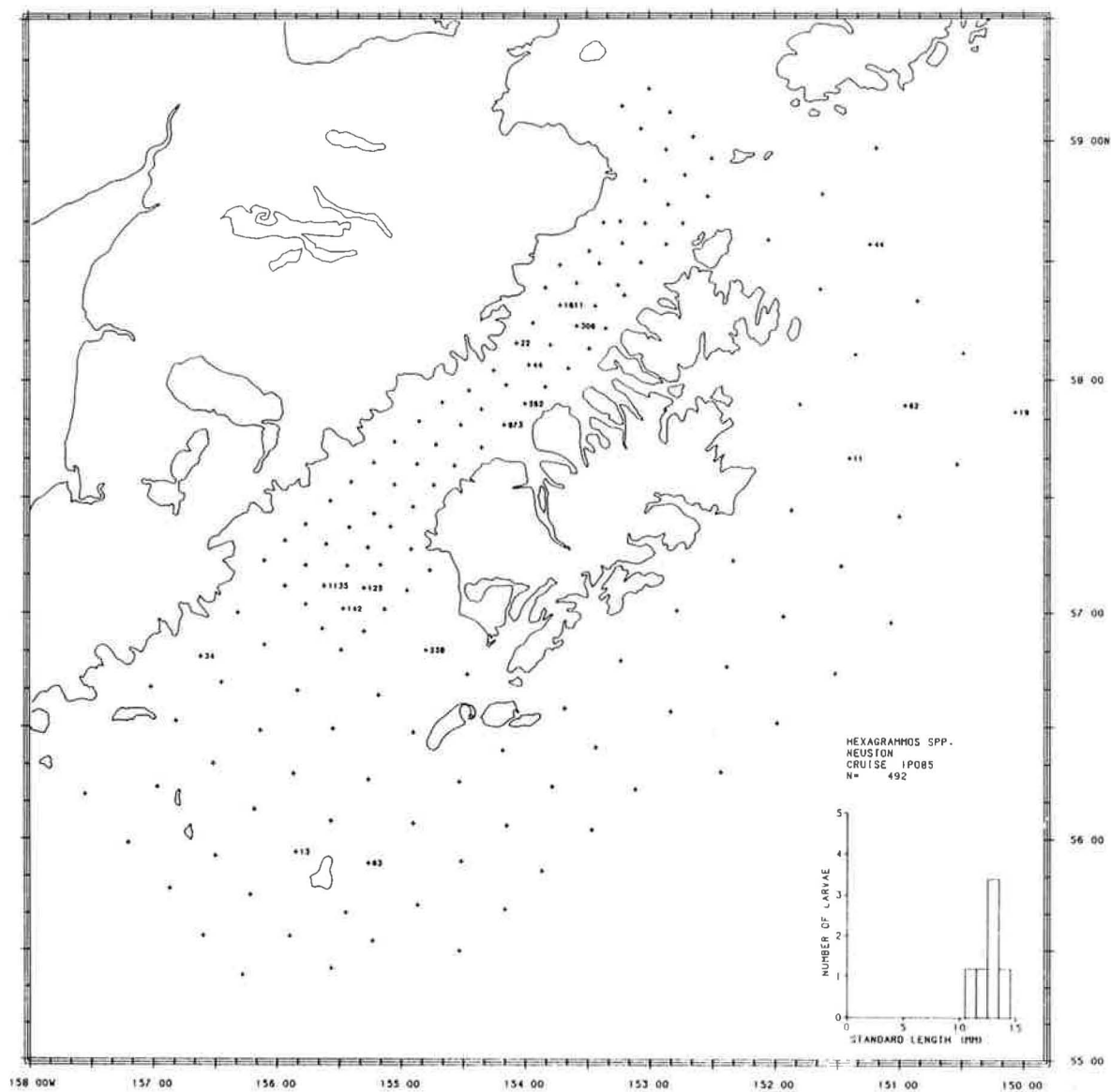
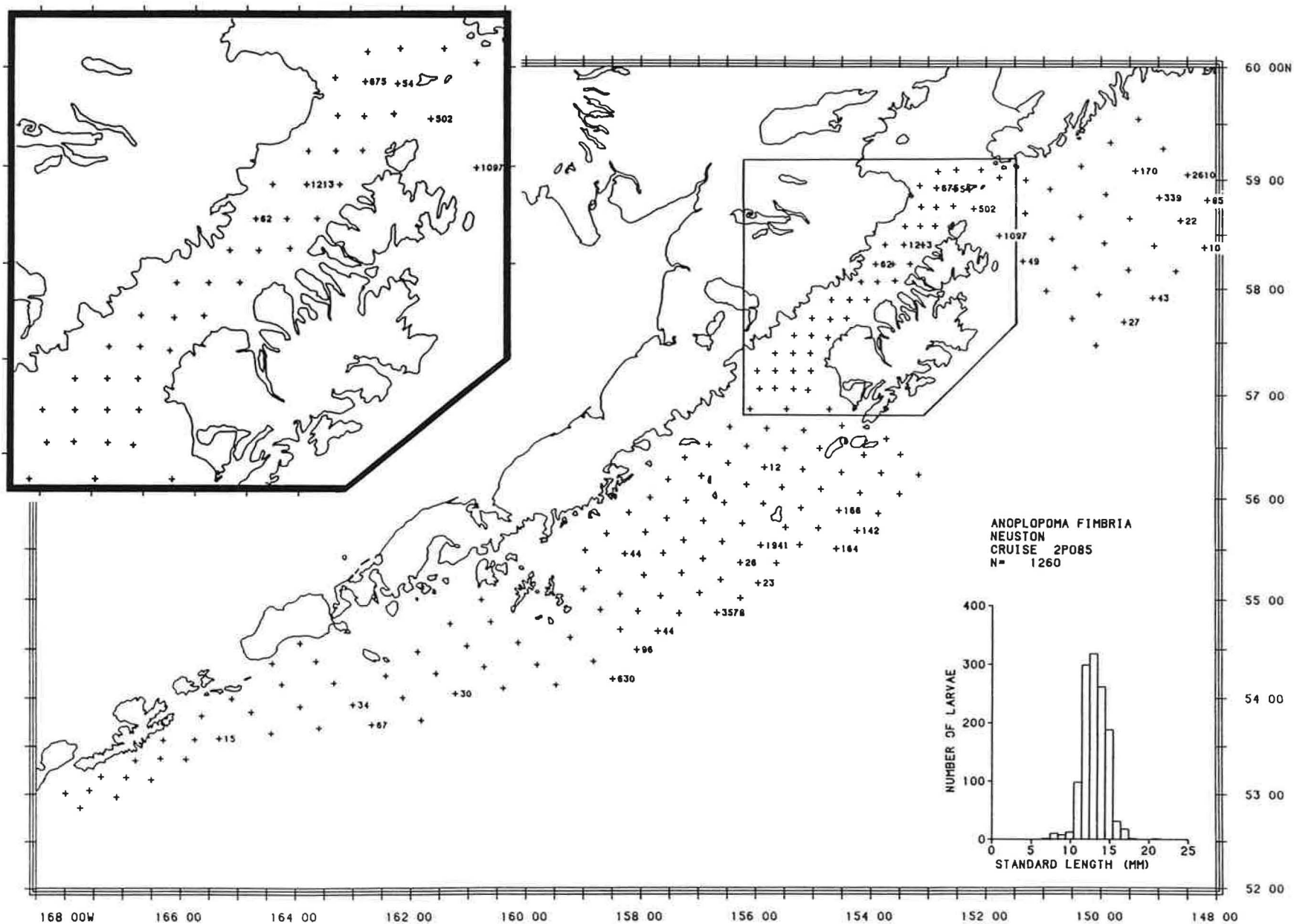


Figure 29.--Distribution and size frequency distribution of larvae of Hexagrammos spp. from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

Figure 30.--Distribution and size frequency distribution of larvae of *Anoplopoma fimbria* from neuston tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 1000 m³.



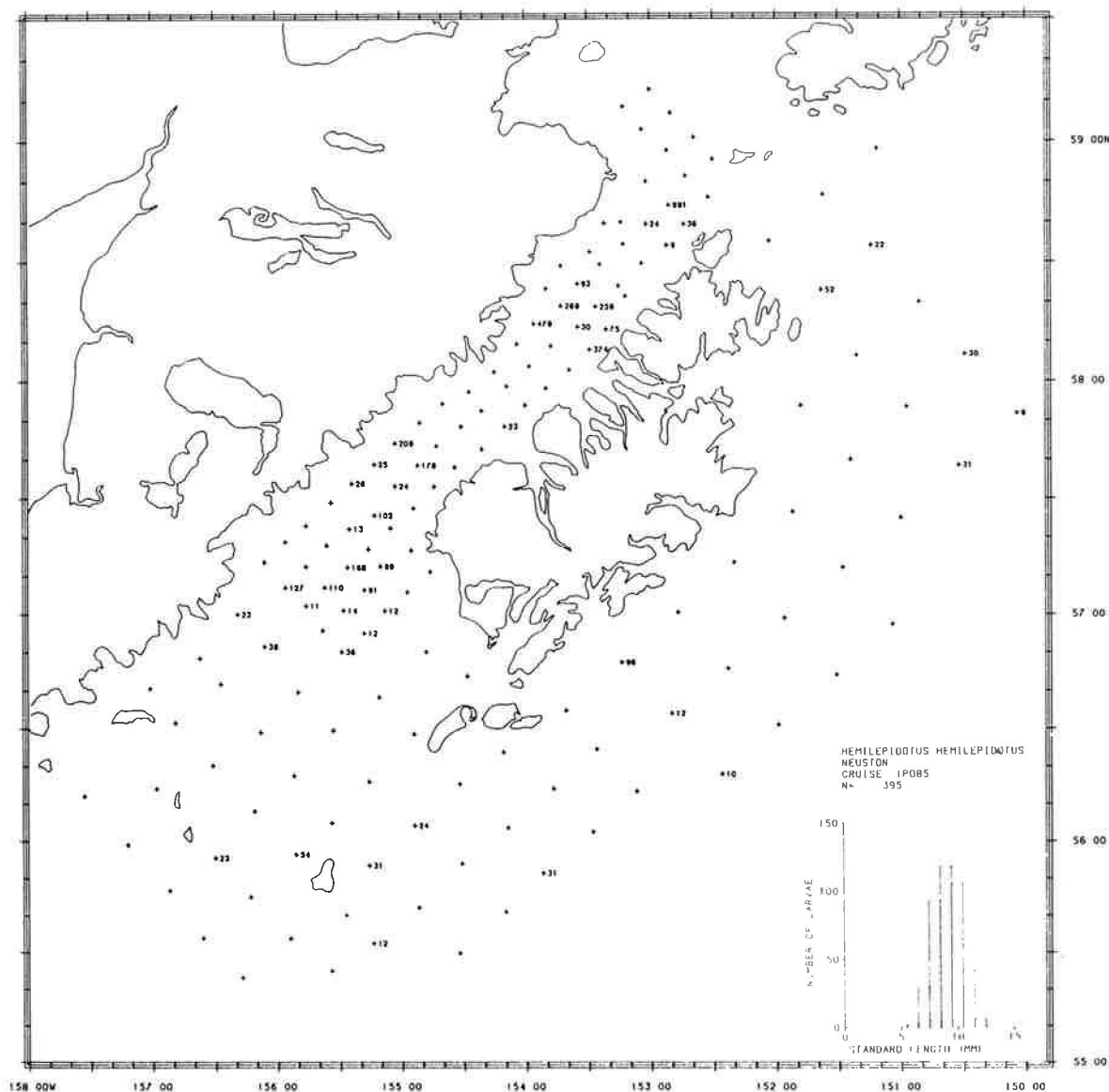
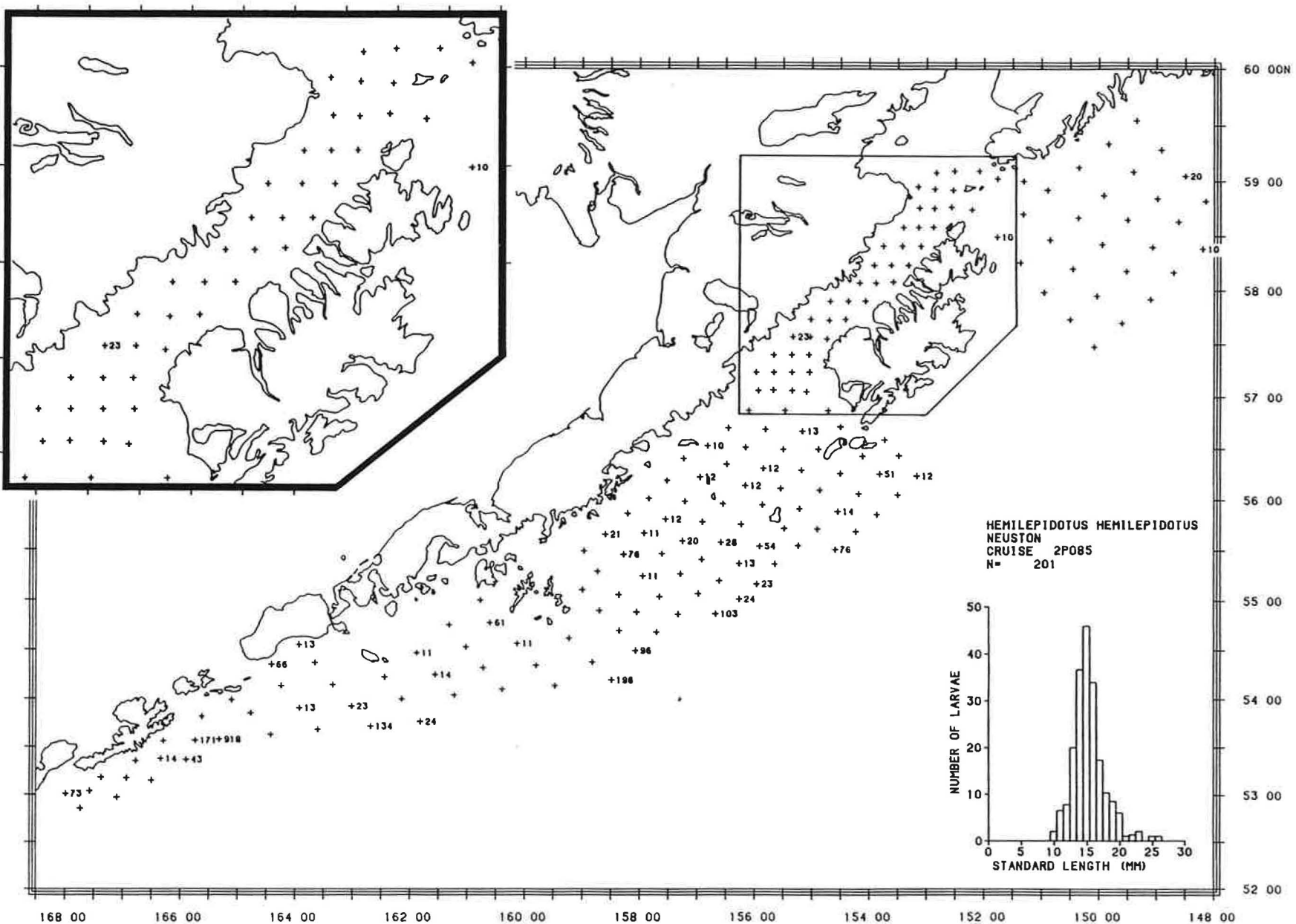


Figure 31.--Distribution and size frequency distribution of larvae of Hemilepidotus hemilepidotus from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.



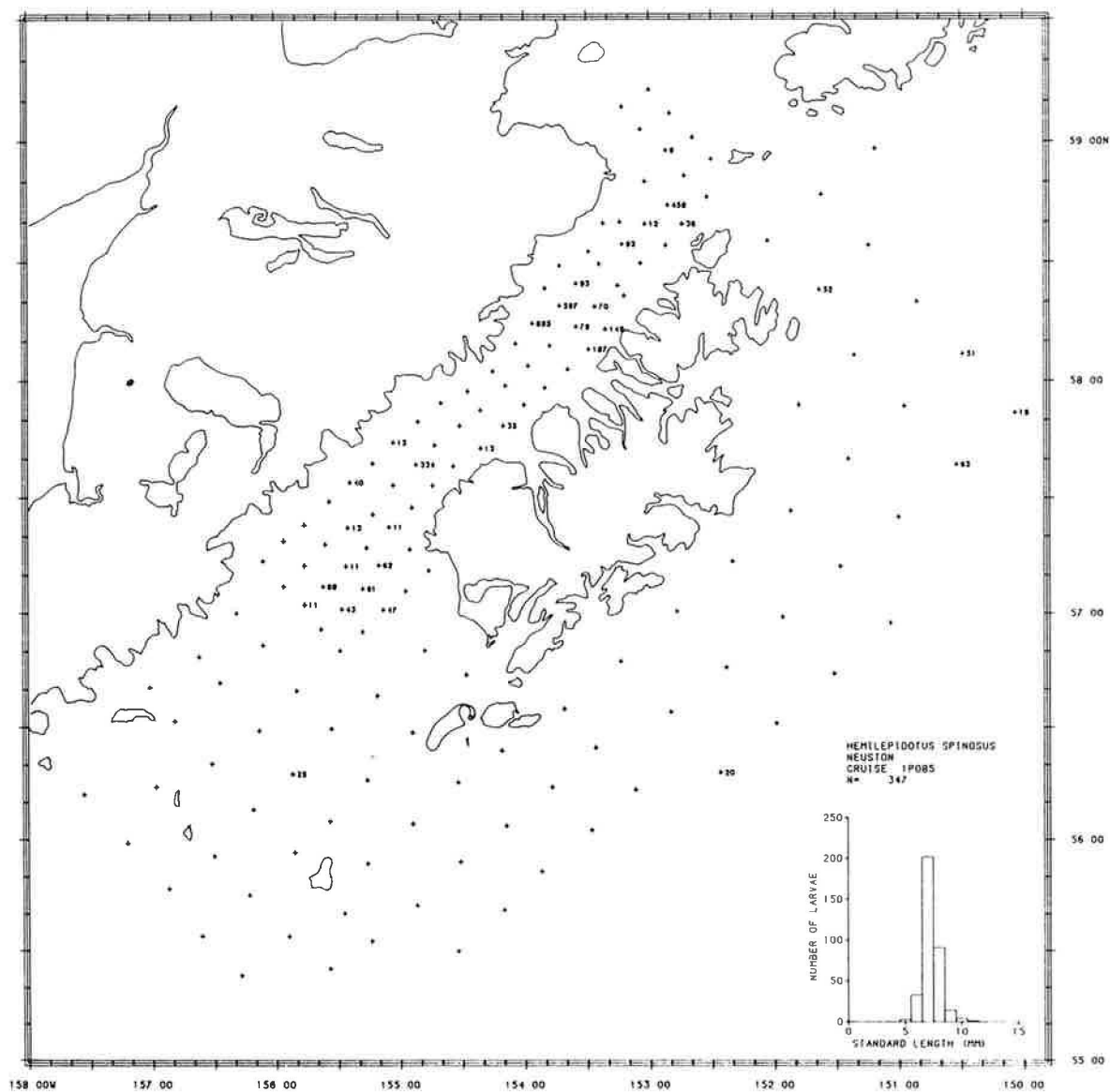


Figure 33.--Distribution and size frequency distribution of larvae of Hemilepidotus spinosus from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

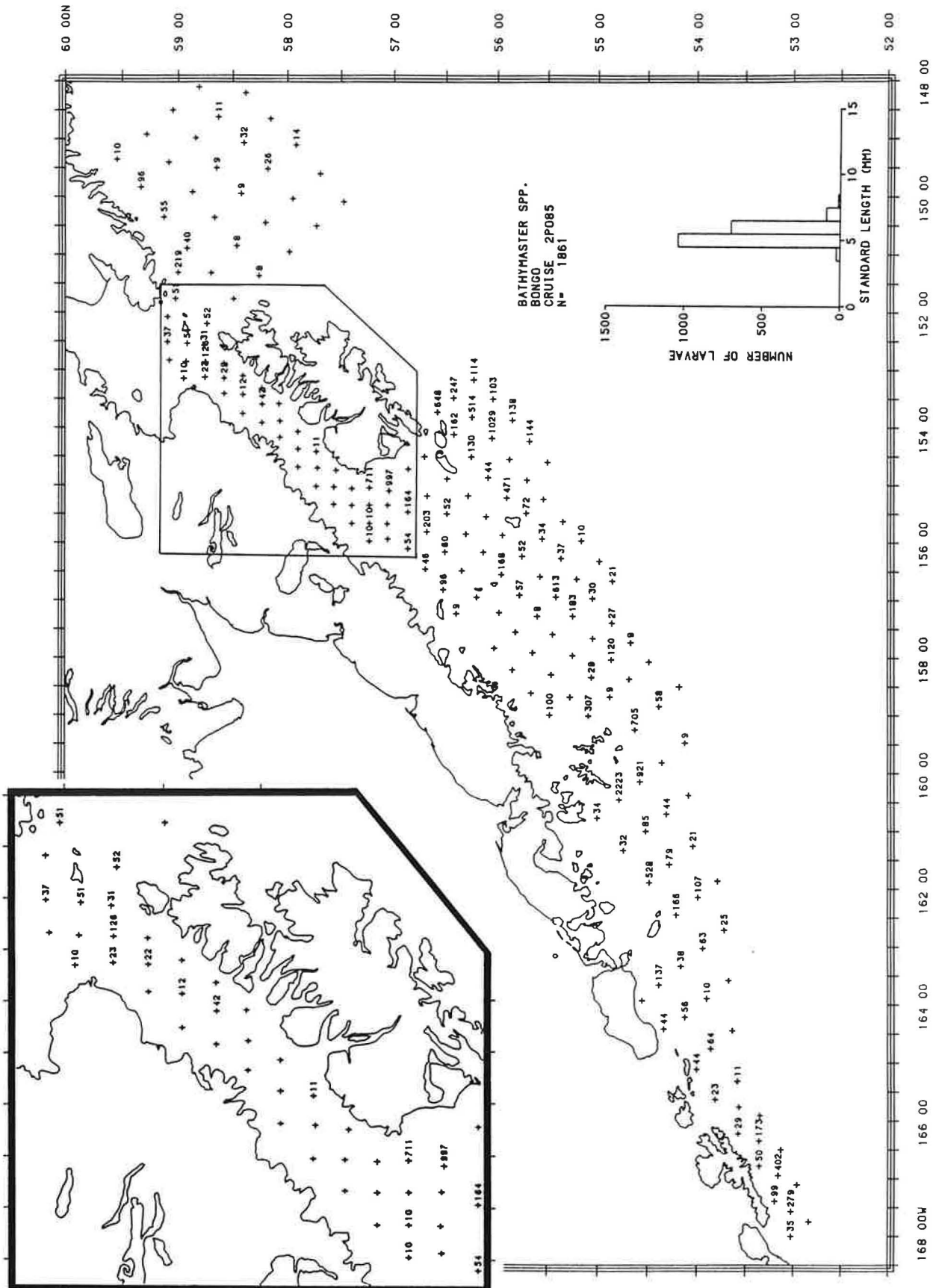


Figure 34.--Distribution and size frequency distribution of larvae of *Bathymaster* spp. from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

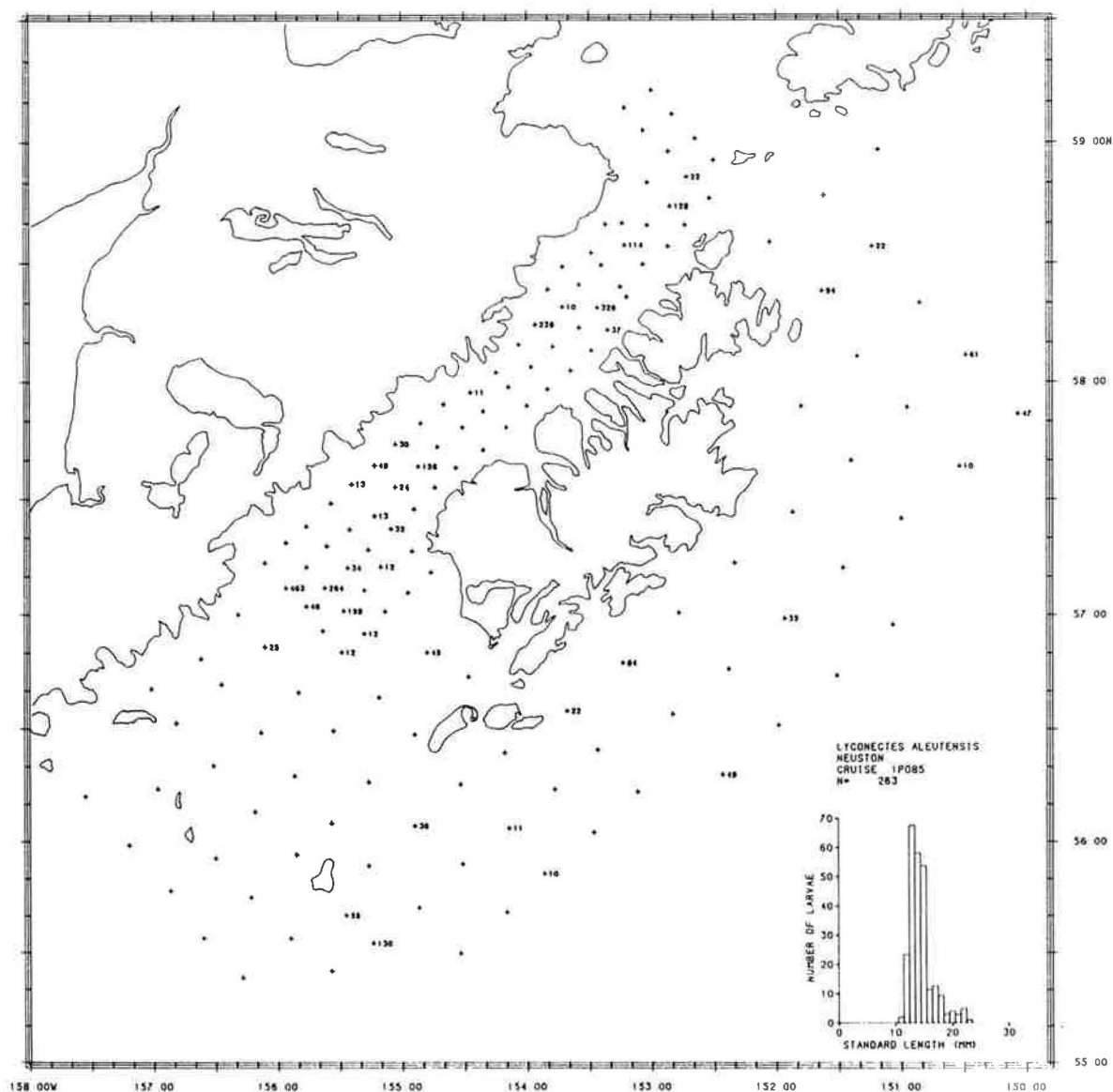
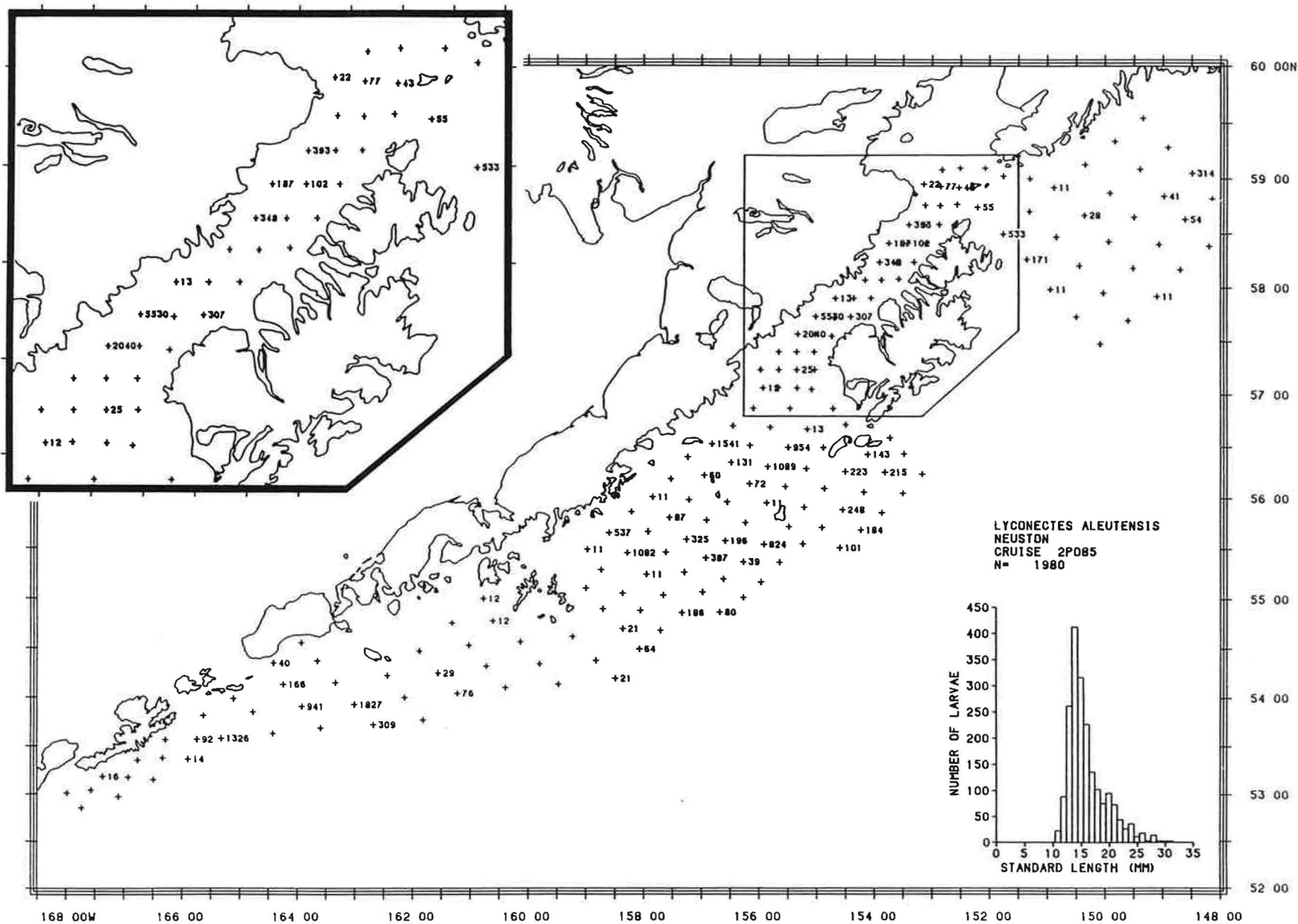


Figure 35.--Distribution and size frequency distribution of larvae of Lyconectes aleutensis from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.



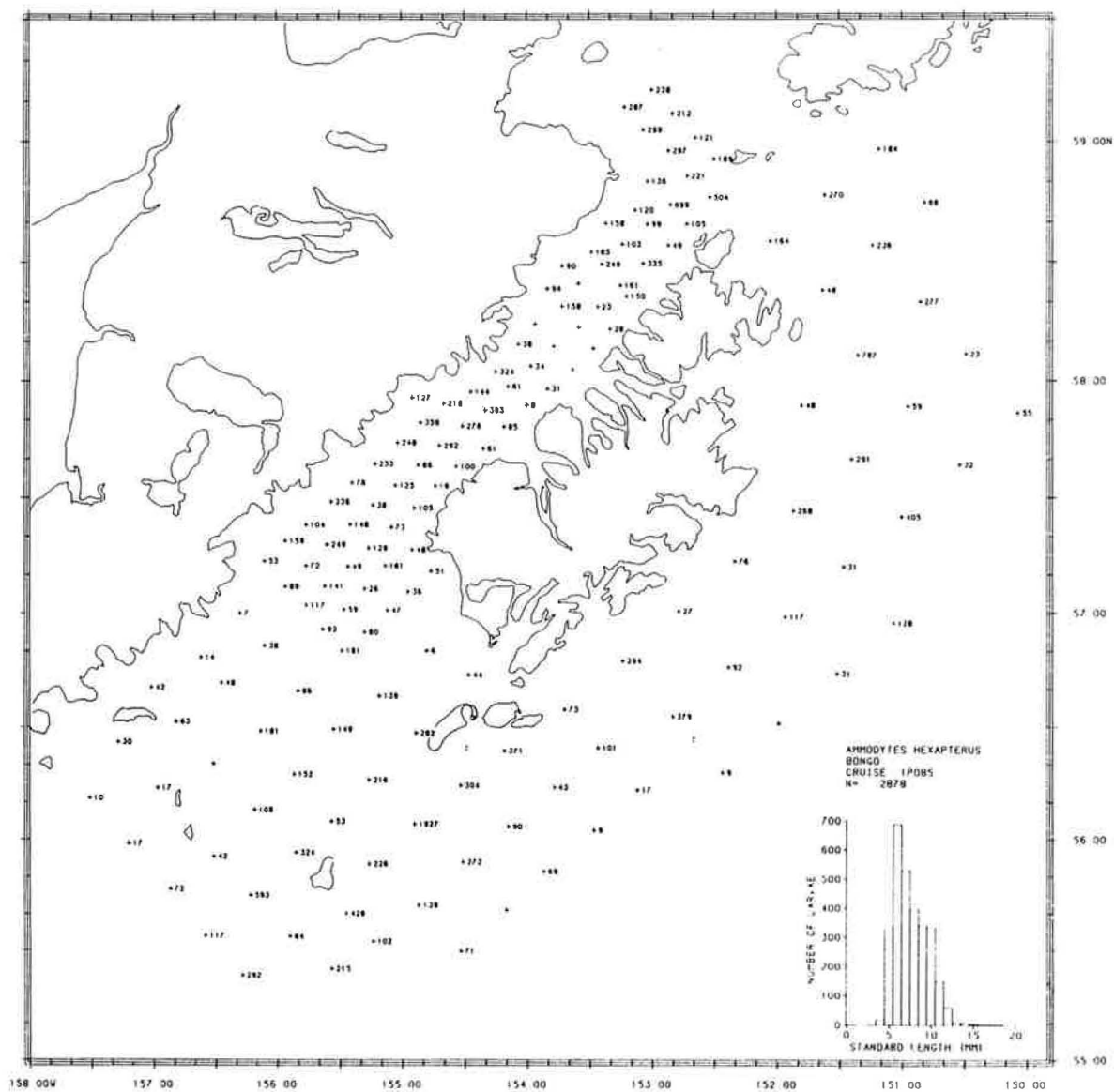
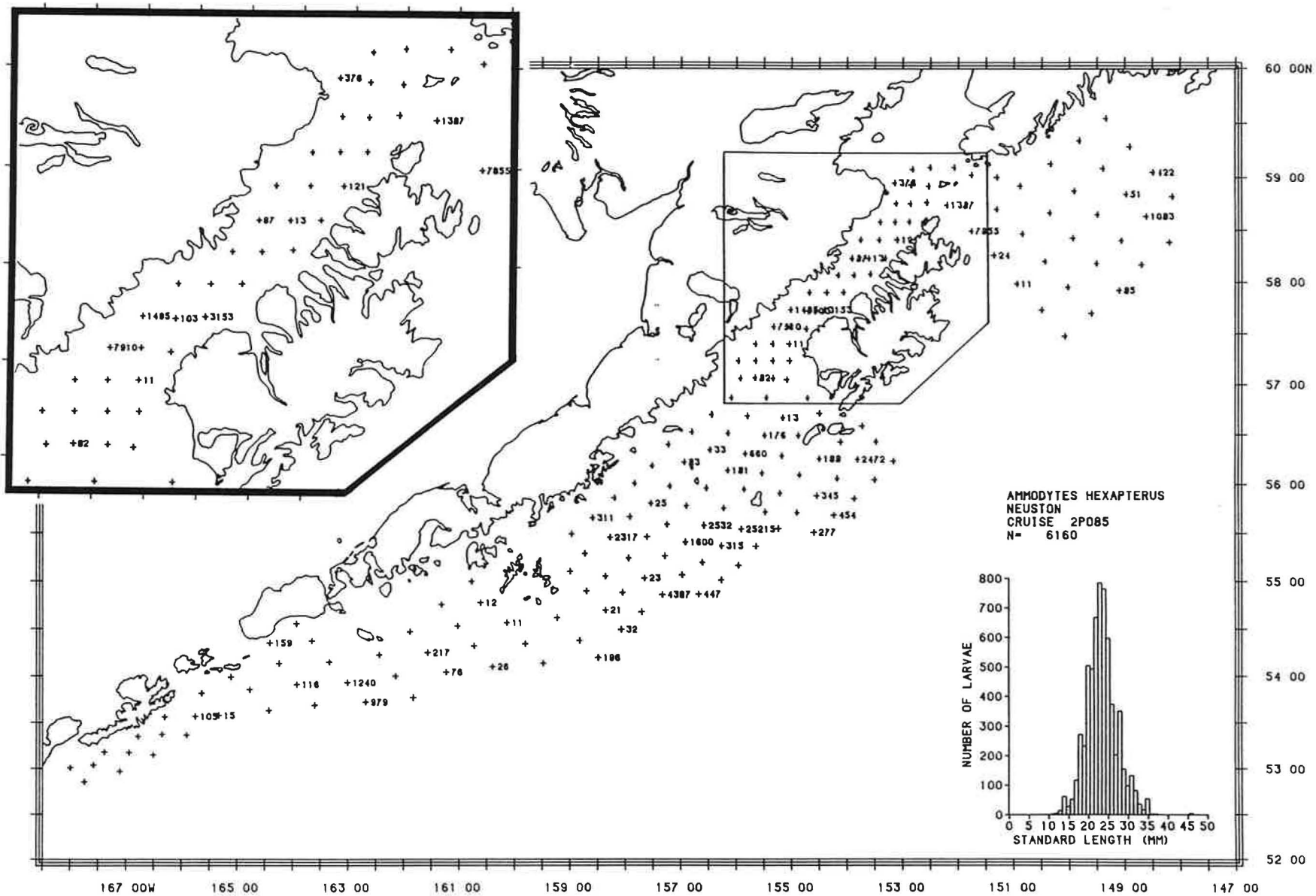


Figure 37.--Distribution and size frequency distribution of larvae of Ammodytes hexapterus from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².



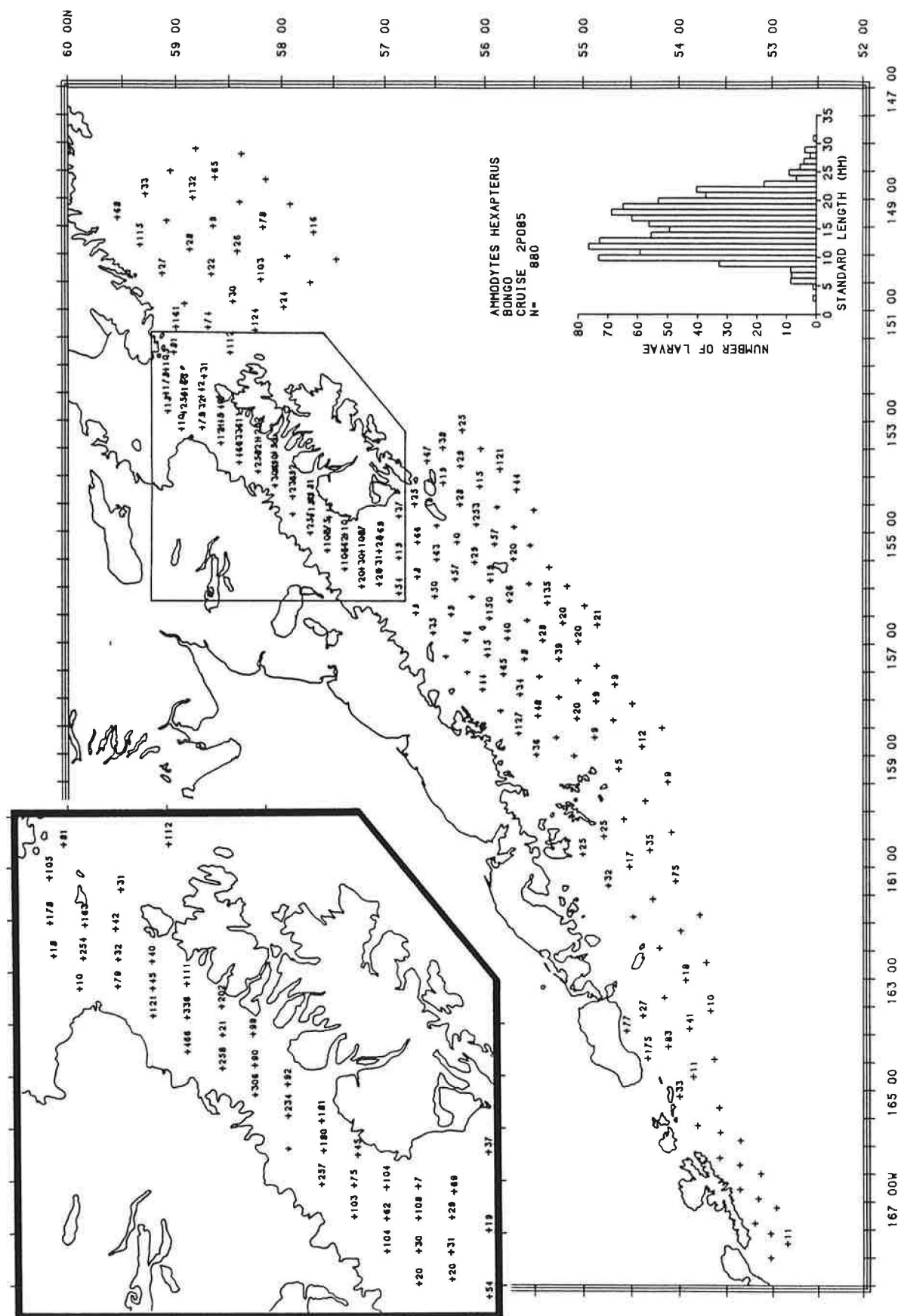


Figure 39.--Distribution and size frequency distribution of larvae of Ammodytes hexapterus from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m³.

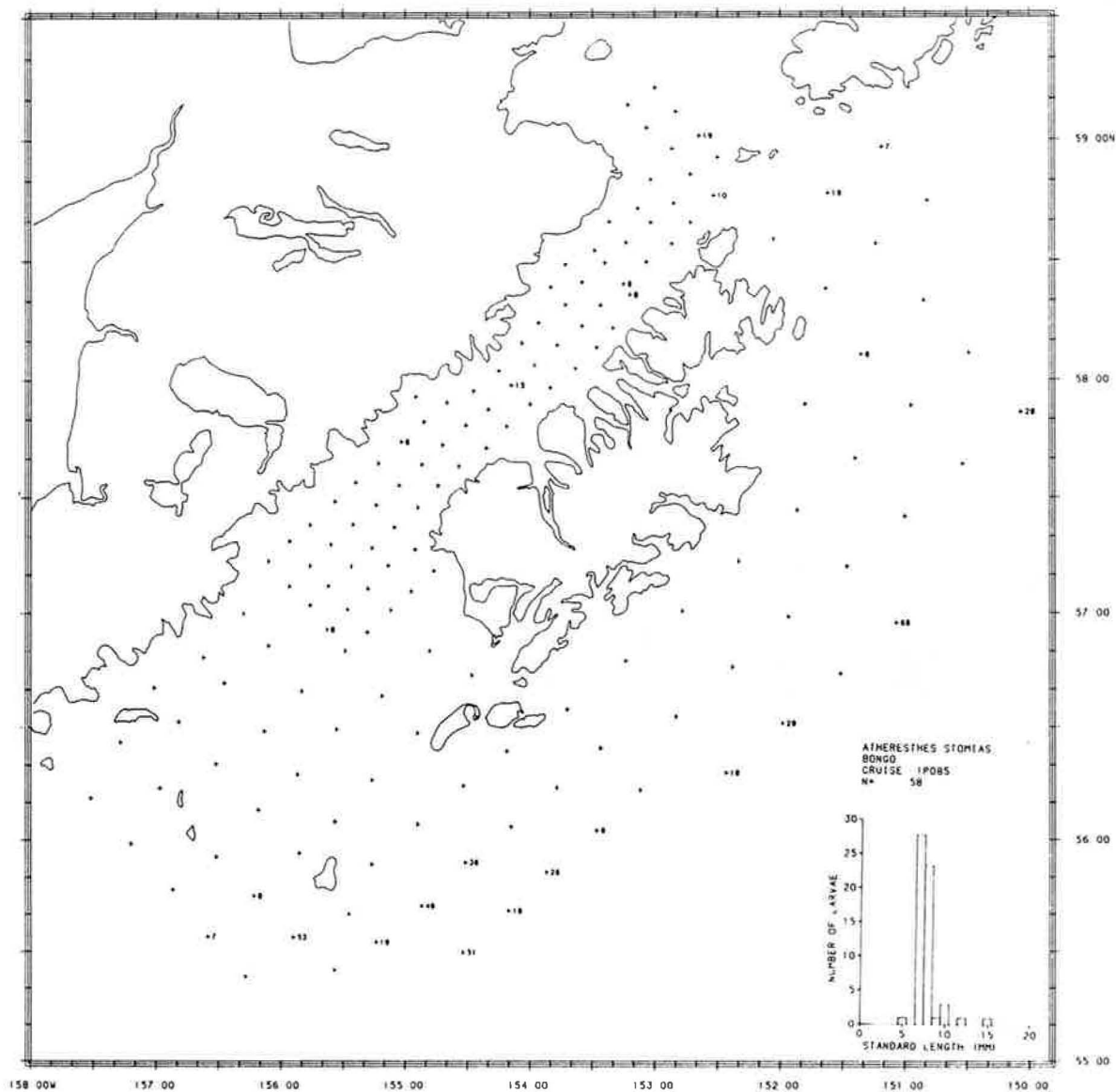


Figure 40.--Distribution and size frequency distribution of larvae of Atheresthes stomias from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

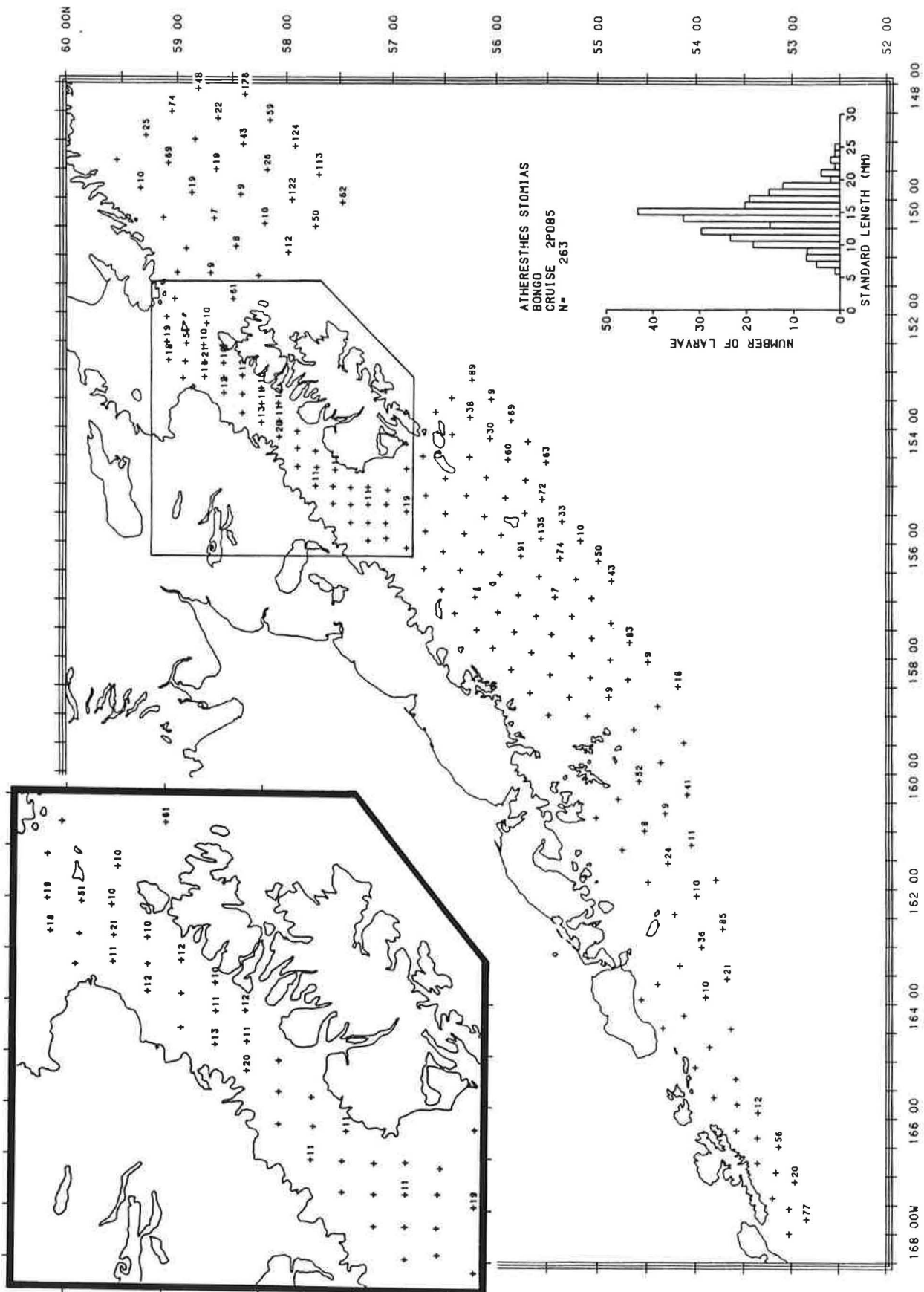


Figure 41.--Distribution and size frequency distribution of larvae of *Atheresthes stomias* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

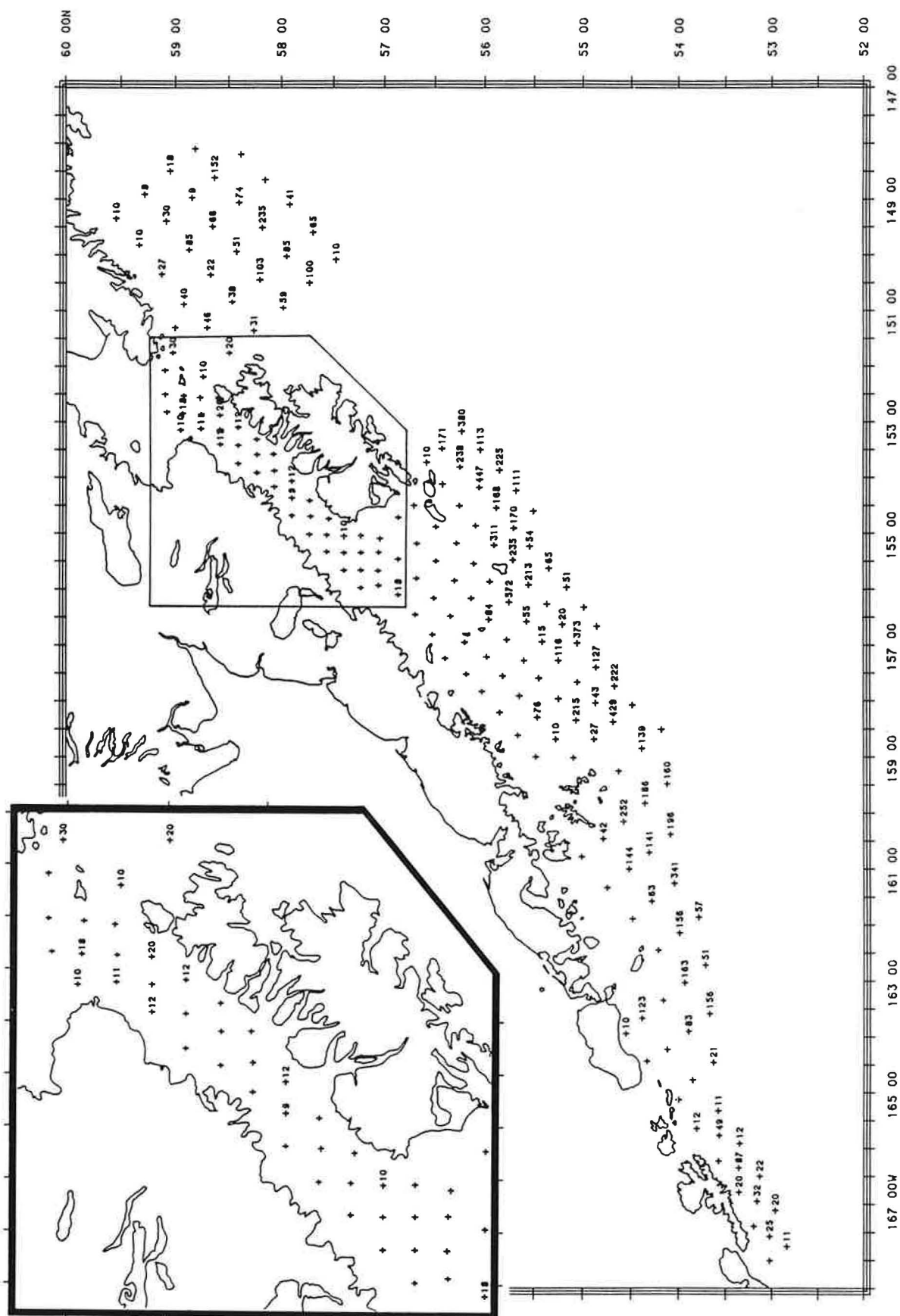


Figure 42.--Distribution of eggs of *Glyptocephalus zachirus* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

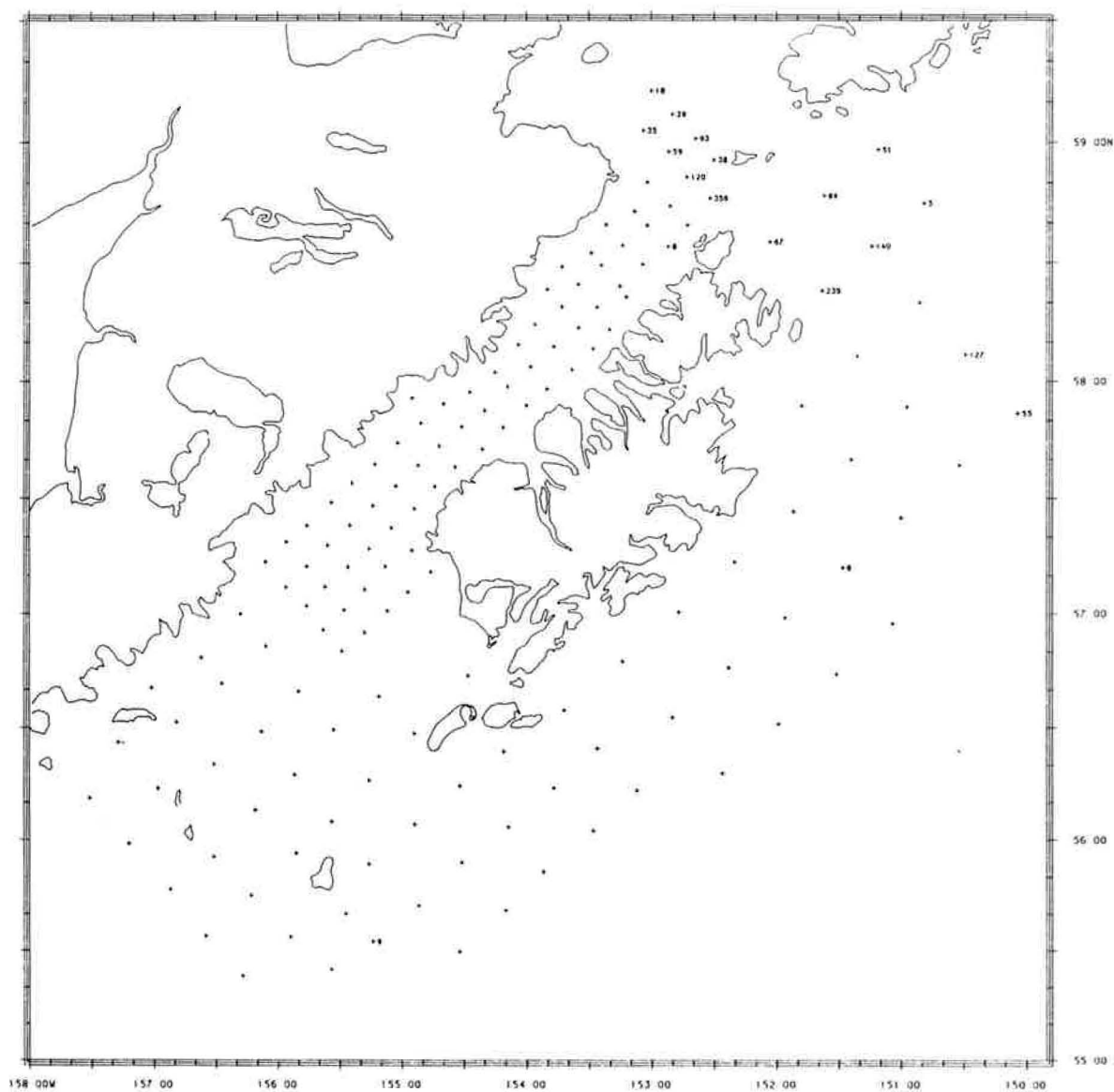


Figure 43.--Distribution of eggs of *Hippoglossoides elassodon* from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

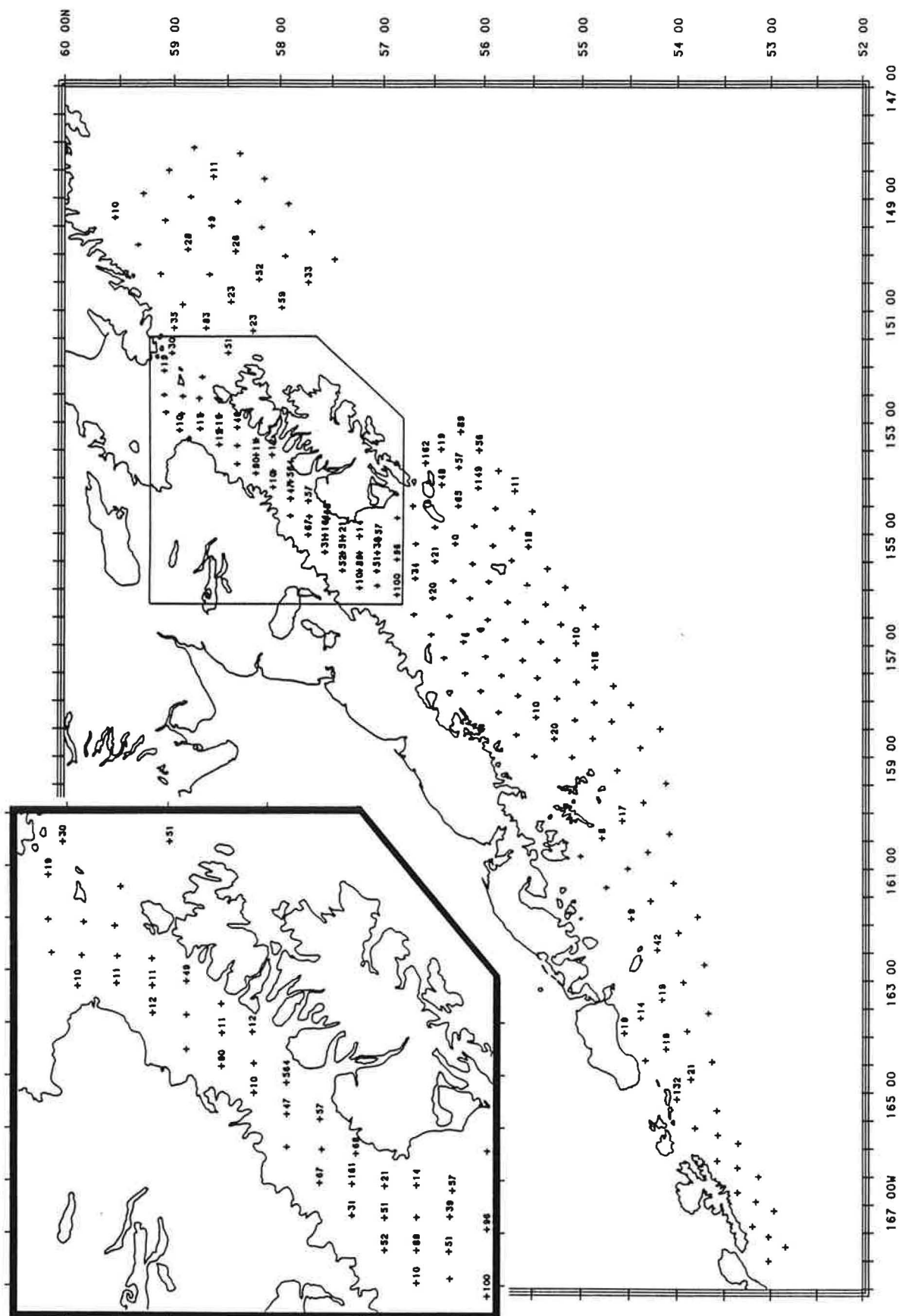


Figure 44.--Distribution of eggs of *Hippoglossoides elassodon* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

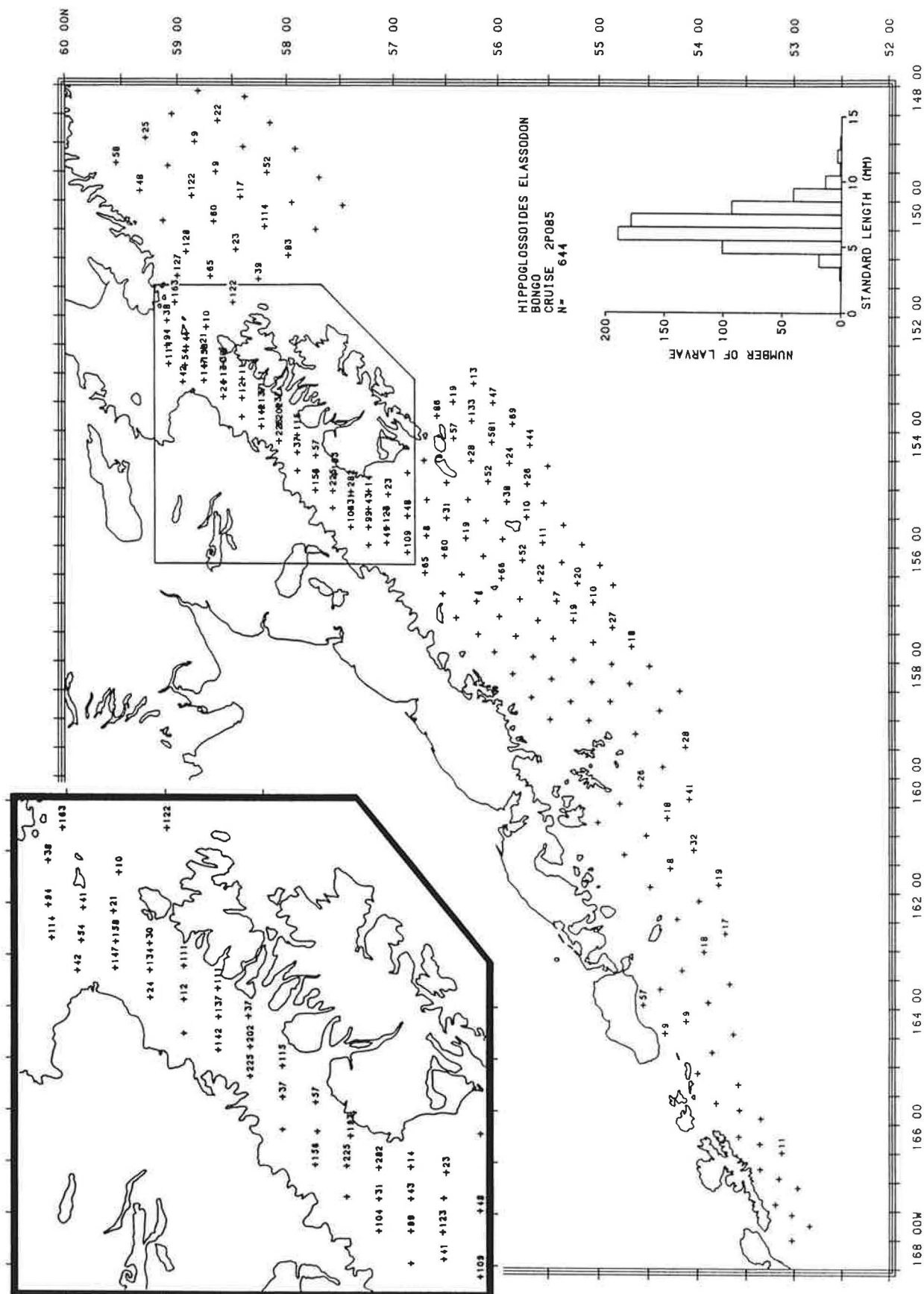


Figure 45.--Distribution and size frequency distribution of larvae of *Hippoglossoides elassodon* bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

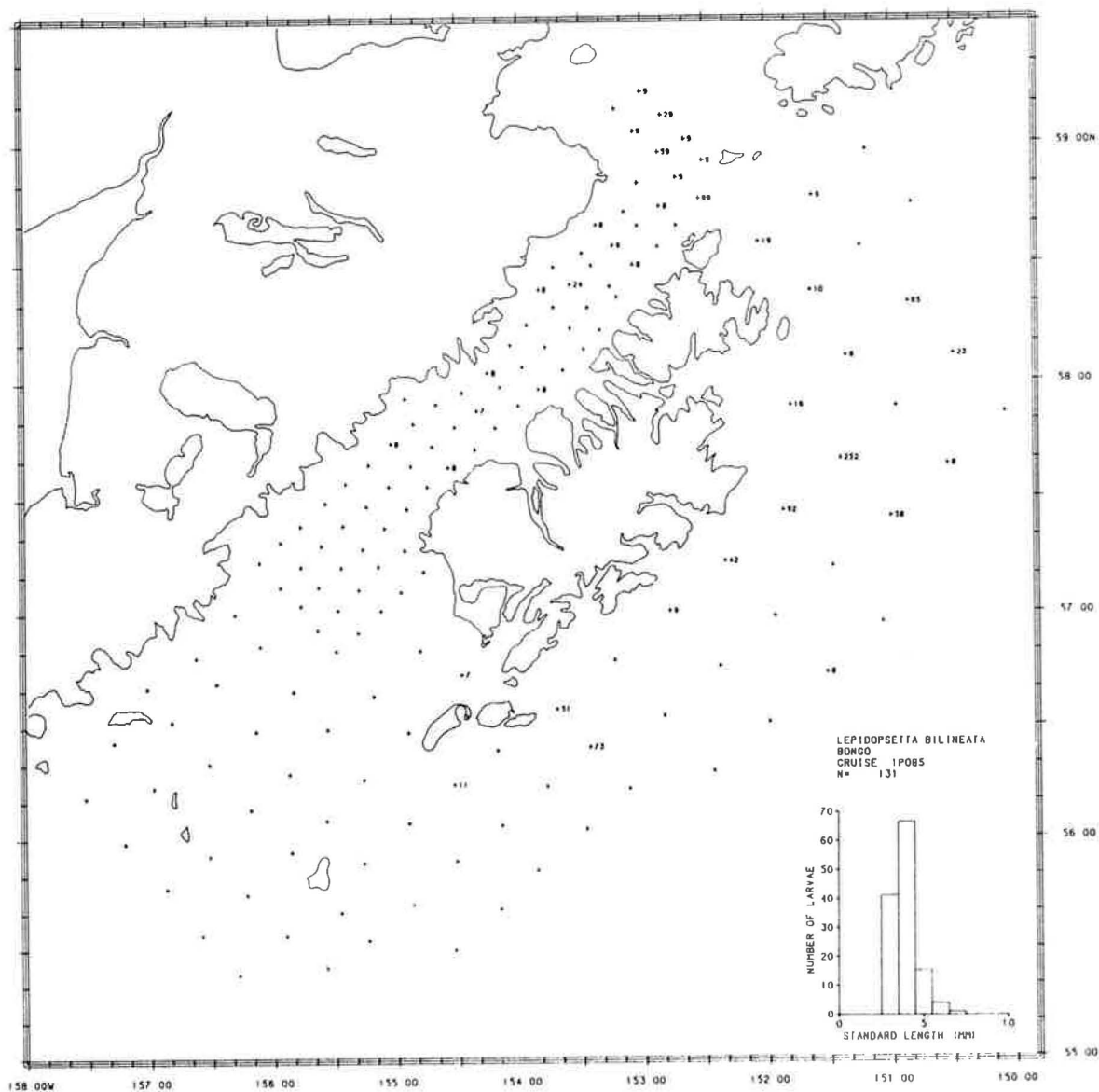


Figure 46.--Distribution and size frequency distribution of larvae of Lepidopsetta bilineata from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².

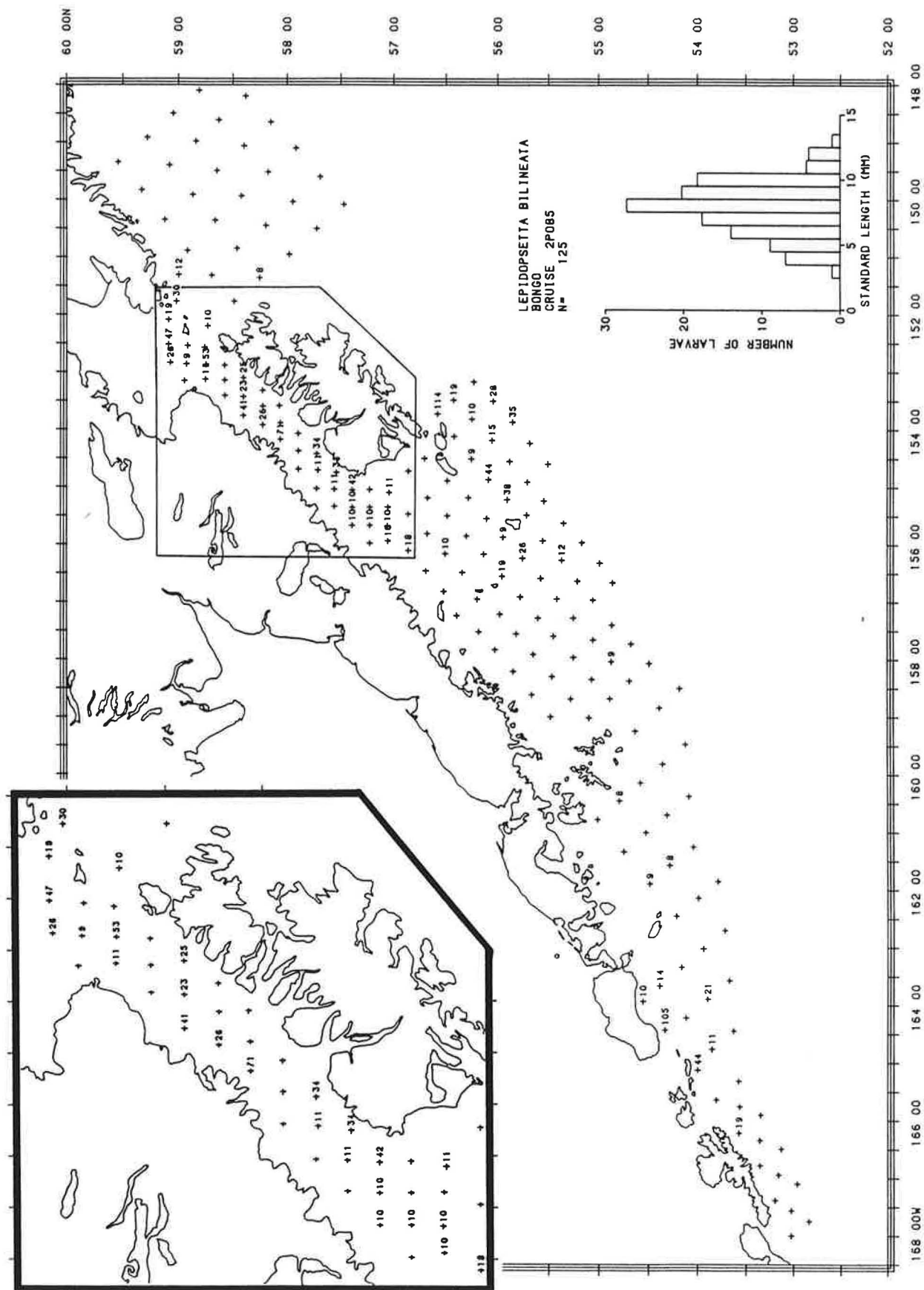


Figure 47.--Distribution and size frequency distribution of larvae of *Lepidopsetta bilineata* from bongo tows during cruise 2P085, May-June 1985. Abundance expressed as numbers per 10 m².

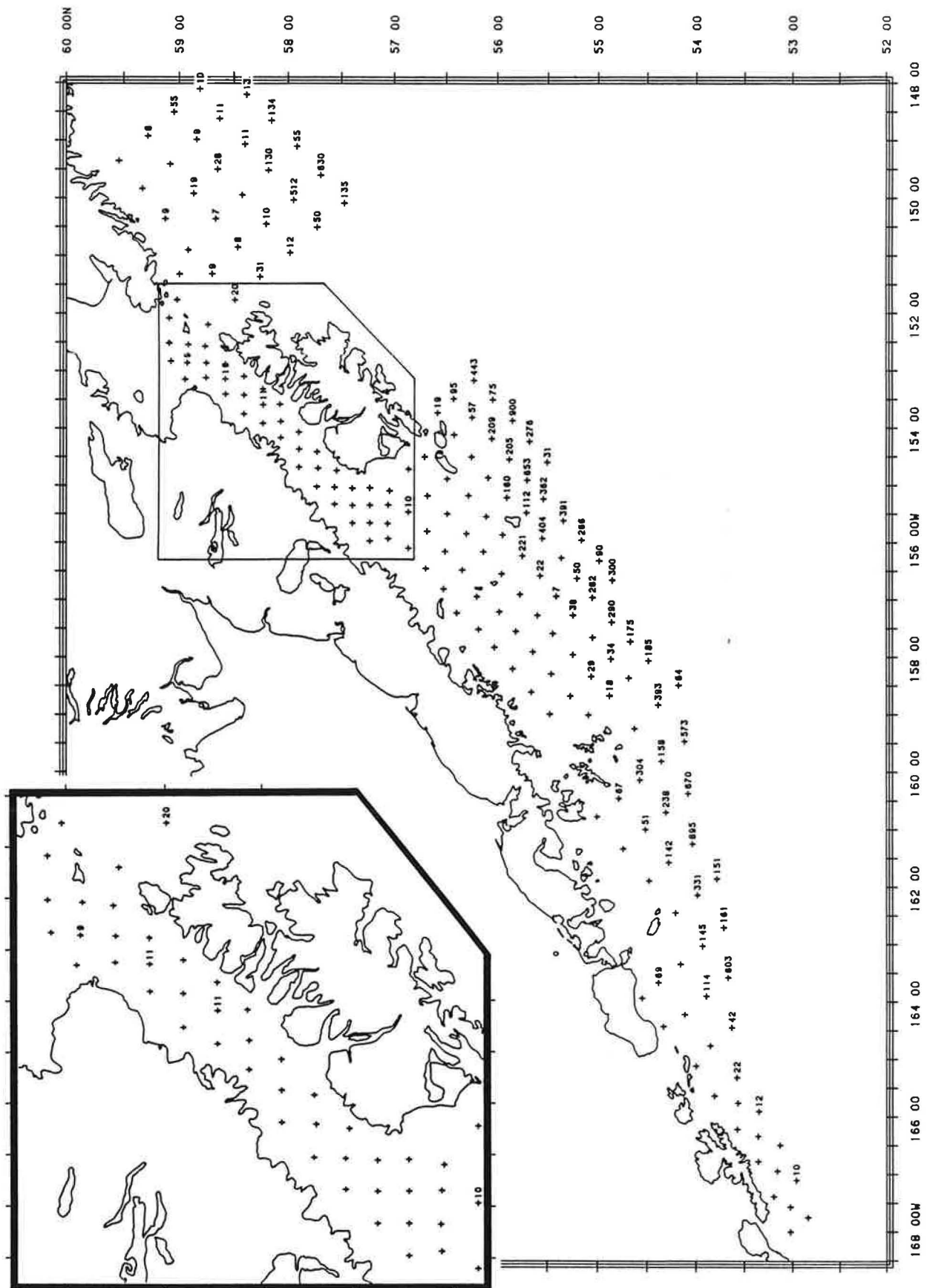


Figure 48.--Distribution and size frequency distribution of eggs of *Microstomus pacificus* from bongo tows during cruise 2PO85, May-June 1985. Abundance expressed as numbers per 10 m².

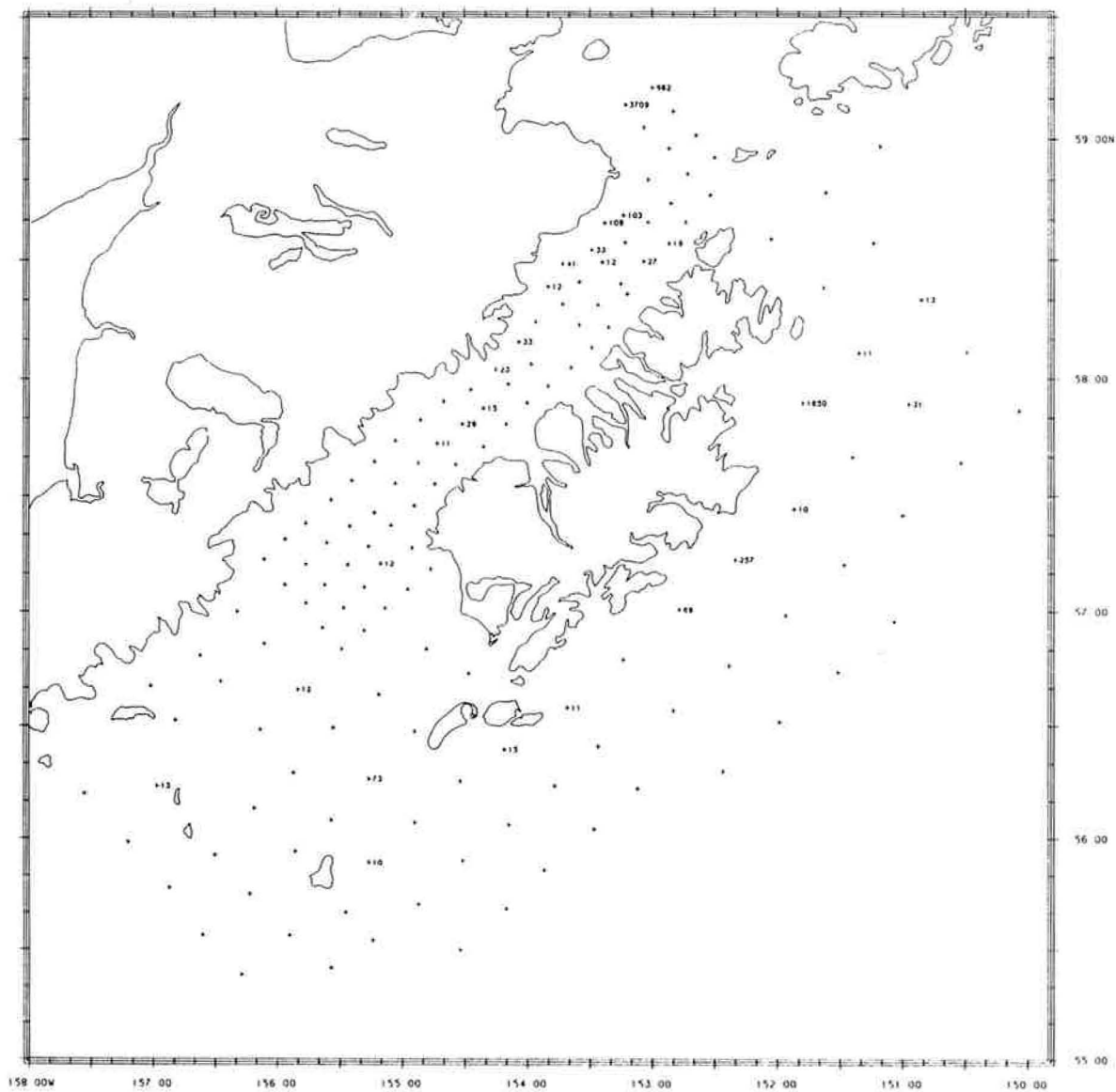


Figure 49.--Distribution of eggs of unidentified pleuronectids from neuston tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 1000 m³.

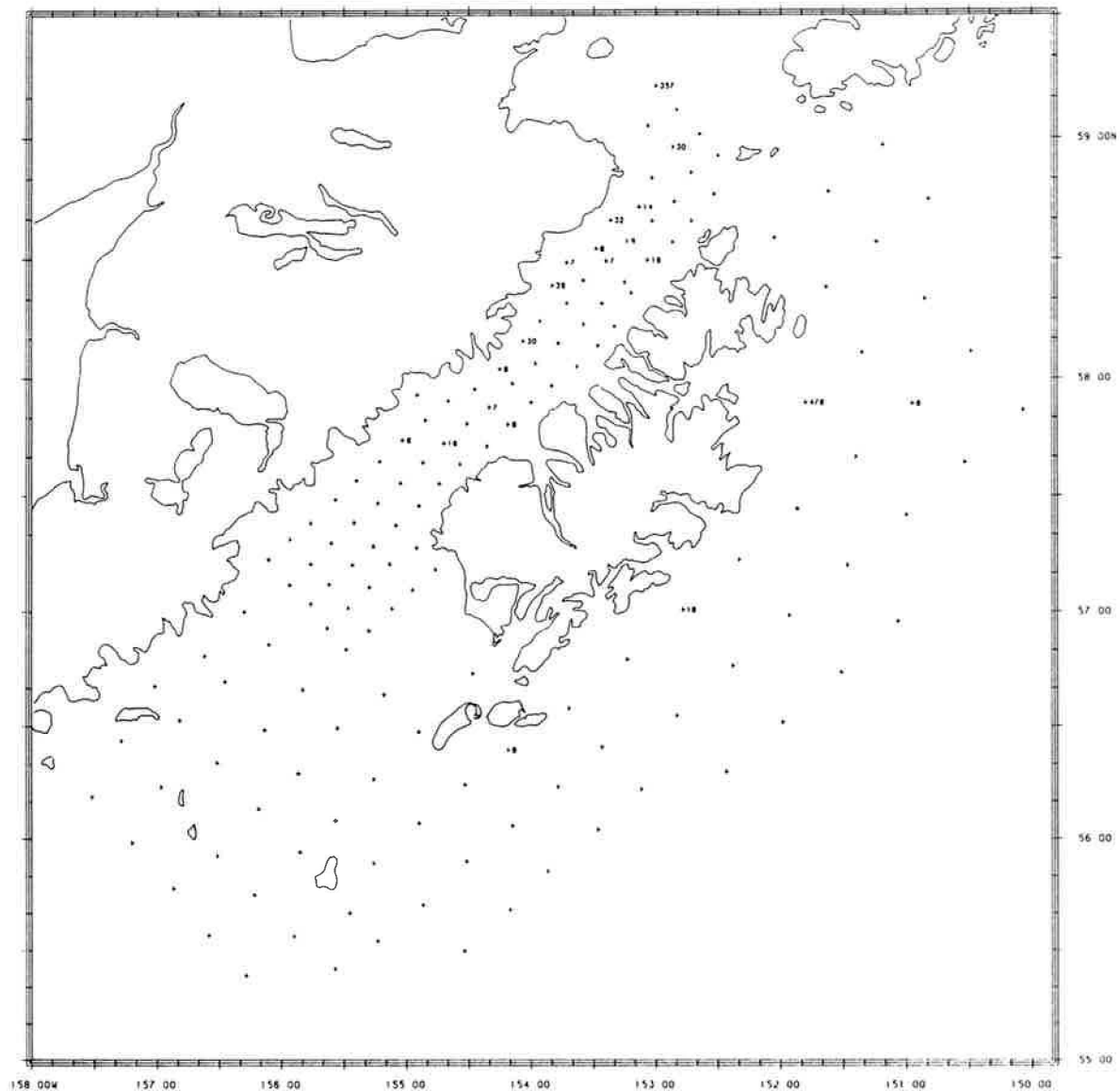


Figure 50.--Distribution of eggs of unidentified pleuronectids from bongo tows during cruise 1P085, March-April 1985. Abundance expressed as numbers per 10 m².