

Marine Fisheries Resources Survey
Demersal Trawling BGD/80/025/CR11

Survey Cruise Report No. 11, May 19 - 24, 1985 and
July 12 - 17, 1985

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ACKNOWLEDGEMENT

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Information provided in this Cruise Report is the result of analysis of data obtained during the survey cruise. Any interpretation of these data represents the opinions of the authors alone and does not necessarily represent the opinion of the Food and Agriculture Organization.

Similarly, the designations employed and the presentation of the material and maps in this document do not imply the expression of any opinion whatsoever on the part of the United Nations or the Food and Agriculture Organization of the United Nations concerning the legal or constitutional status of any country, territory or sea area, or concerning the delimitation of frontiers.

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1 INTRODUCTION

In order to understand more about the abundance and distribution of the living marine resources within the Bangladesh continental shelf, the Bangladesh Government, with the assistance of FAO, commenced a comprehensive survey programme in September 1984.

Initially, the investigations concentrated on the demersal resources, which were surveyed using a 32m, research vessel with a high opening demersal fish/shrimp trawl. A series of cruises were planned to cover both the summer monsoon (April-September) and winter (October-March) periods. Due to the widespread influence of the monsoon discharge of the Ganges/Brahmaputra river system, into the northern Bay of Bengal it was important that the survey be conducted during both seasons.

In May, 1985, Cruise No. 12 was abandoned after only 13 stations had been trawled. Due to the inclement weather conditions, no survey cruises were conducted in June. In July, an attempt was made to continue the survey programme, However Cruise No. 13 was also abandoned due to the weather conditions after only 13 stations had been trawled.

This report is a summary of the results obtained from these two cruises, Nos 12 and 13. As too few stations were trawled on each occasion to allow any meaningful analysis of the results and too much time had elapsed between them for the results to be pooled, this cruise report is a only a summary of the results obtained during these cruises.

2. MATERIALS AND METHODS

2.1 THE SURVEY AREA AND SELECTION OF TRAWL STATIONS

The survey area extended from the 10 metre depth contour in the north and east, to the 200 metre depth contour in the south. A line drawn at 45° from the southern tip of St. Martins Island was considered to approximate the Bangladesh/Burmese marine border in the south east. In the west, the survey area extended to the Bangladesh/Indian marine border, but in practice no trawling was conducted west of the eastern edge of the "swatch of no ground". The survey area, together with the 10, 20, 30, 51, 100 and 200 metre depth contours is outlined on all Figures used in this report. Fifty trawl stations were selected prior to each cruise on a random basis covering the entire survey area. The survey area and stations actually surveyed are shown on Figures 1 (Cruise No. 12) and 2 (Cruise No. 13).

The most practical cruise track to cover these stations was selected by the captain of the research vessel in consultation with the cruise leader.

2.2. THE VESSEL AND GEAR

The survey vessel, the R/V "Anusandhani" is a 32.4 metre "multipurpose" research vessel, although principally designed for stern trawling, constructed in Japan in 1979. Details of the vessel are provided in Appendix A.

The trawl net used was an Engel high opening fish/shrimp trawl with a cod-end mesh size of 32mm. Details of the fishing gear are provided in Appendix B.

Secchi disc transparencies and surface water temperatures were taken at all stations using a standard 30cm diameter white disc and 0-51°C thermometer and bucket respectively.

2.3 TREATMENT OF THE CATCH

Stations were trawled during daylight in order to avoid any possible bias in catch rates due to day/night variations in abundance. All hauls were of 30 minutes duration, the time commencing when the net reach the bottom, as determined by the net-sonde and terminating when hauling commenced. If trawls were discontinued within 15 minutes of shooting, they were considered invalid and the results discarded.

The catch was sorted into species and each weighed separately to the nearest 0.25 kg. In the event that the catch in a particular haul exceeded 500 kgs (approximately) then it was subjectively subdivided into two equal portions, one of which was sorted and the results then doubled. In the number of individuals of any species present in the catch was less than around 20 then the numbers of that species in the haul was counted in order to calculate the average weight of the species. If the number was greater than this, then a weighed sample was usually taken for length/frequency measurement and the average weight calculated in this manner.

In any event, samples of 50-200 fish were selected randomly for length measurement for most species in the catch, where the species were clearly identifiable. As the taxonomy of the catfish (Family Ariidae) and jewfish (Family Sciaenidae) was confused no length measurements were made for these two Families. Lengths were in cms, fork length.

2.4 DATA ANALYSIS

All data were recorded on proforma sheets which are shown in Appendix C. A Hewlett Packard 86B microcomputer was used to store and analyse the catch, length frequency and oceanographic data, using programmes written specifically for the purpose.

For the analysis of the length frequency data, the survey area was subdivided into eight zones. For each species, samples taken from within the same zone were pooled and a single histogram produced for that zone. The histograms were then plotted onto the maps of the survey area in the position where the samples were taken. The eight zones are shown with each of these histograms.

3 RESULTS

As described above, only thirteen of the planned fifty stations were sampled during each of Cruises No. 12 and 13. Most of the hauls made during Cruise No. 12 were carried out along the northern shallow areas of the survey area, while those during cruise No. 13 were along the eastern shallow areas. The following is a summary of the stations successfully trawled by depth zone. The positions of these stations are shown on Figures 1 and 2 and catch rates obtained on Figures 3 and 4.

| Depth zone | No. of successful hauls | |
|--------------|-------------------------|---------------|
| | Cruise No. 12 | Cruise No. 13 |
| 10-20 metres | 3 | 4 |
| 21-30 .. | 2 | 5 |
| 31-50 .. | 2 | 3 |
| 50-100 .. | 6 | 1 |
| Total : | <u>13</u> | <u>13</u> |

Table 1 below lists the ten major species groups or Families caught during each survey cruise both in terms of their relative abundance in the total catch of that cruise and rank,

TABLE 1

| Family | Cruise No. 12 | | Cruise No. 13 | |
|--|---------------|------|---------------|------|
| | % of catch | Rank | % of catch | Rank |
| CARANGIDAE (Jacks, scads, trevallies etc) | 32.6 | 1 | 0.7 | |
| ARIIDAE (catfish) | 15.9 | 2 | 16.1 | 3 |
| SCIAENIDAE (jewfish) | 12.9 | 3 | 18.7 | 2 |
| NEMIPTERIDAE (threadfin bream) | 6.8 | 4 | Not present | |
| TRICHIURIDAE (Hairtail) | 5.5 | 5 | 2.5 | 7 |
| Trash Fish | 5.4 | 6 | 1.5 | 8 |
| LEIOGNATHIDAE (pony fish) | 3.9 | 7 | Not present | |
| CLUPEIDAE (herrings, shads etc.) | 3.3 | 8 | 3.3 | 5 |
| MULLIDAE (goatfish) | 3.0 | 9 | 0.2 | |
| Rays | 2.3 | 10 | 4.0 | 4 |
| HARPADONTIDAE (Bombay duck) | 0.8 | | 44.7 | 1 |
| ENGRAULIDAE (sardines) | 0.4 | | 3.0 | 6 |
| POLYNEMIDAE (Threadfin) | 0.1 | | 1.4 | 9 |
| Penaeid prawns | 0.5 | | 0.8 | 10 |

The average catch rates obtained during each cruise are shown below on Table 2 by depth zone. In view of the relatively small number of hauls involved, direct comparisons are of little value.

TABLE 2

| Depth zone | Cruise 12 | | Cruise 13 | |
|---------------|---|------------------|--|-----------------|
| | Average catch rate (kg/30 min. trawling) | No. of hauls. | Average catch rate (kg/30 min trawling) | No. of hauls |
| 10-20 metres | 259 | 3 | 234 | 4 |
| 21-30 " | 190 | 2 | 800 | 5 |
| 31-50 " | 206 | 2 | 241 | 3 |
| 51-100 " | 370 | 6 | 83 | 1 |
| Total/Average | <u>308</u> | <u>13</u> | <u>310</u> | <u>13</u> |

(Note that the average mean catch rate is a stratified mean value).

The relationship between the depth of capture and total catch rates obtained during each cruise are shown on Figures 5 and 6.

Length frequency histograms are shown for the following species on the following designated Figures :

| | Figure |
|--|---------------------------|
| Japanese threadfin bream, <i>Nemipteus japonicus</i> | 7 |
| White pomfret, <i>Pampus argenteus</i> | 8 (Cr. 12), 9 (Cr. 13) |
| Rainbow sardine, <i>Dussumeria acuta</i> | 10 |
| Lizard fish, <i>Saurida tumbil</i> | 11 |
| Yellow lined goatfish, <i>Upeneus sulphureus</i> | 12 |
| Chinese pomfret, <i>Pampus chinensis</i> | 13 |
| Hard tail scad, <i>Megalaspis cordyla</i> | 14 |
| Black pomfret, <i>Parastromateus niger</i> | 15 |
| Threadfin salmon, <i>Polynemus sextarius</i> | 16 |
| Kuweh trevally, <i>Atropus atropus</i> | 17 |
| Silver lined grunter, <i>Pomadasys hasta</i> | 18 (Cr. 18.), 19 (Cr. 13) |
| Bombay duck, <i>Harpadon neherus</i> | 20 |
| Hairtail, <i>Lepturacanthus savala</i> | 21 |

Secchi disc and surface water temperatures are shown on Tables 3 and 4 for Cruises No. 12 and 13 respectively. Secchi disc readings are also displayed on Figures 22 and 23.

4 DISCUSSION

In view of the relatively few hauls involved, it would be unrealistic to make any statements concerning the distribution or abundance of species in the catches. It is noticeable however from Table 1 that the catch composition was quite different between the two cruises. Only six of the top ten Families caught during Cruise 12 were represented in the top ten Families of cruises 13 and of the other four, two were not present at all in the catch. As the cruises were only conducted approximately one month apart, these differences can only be due to the fact that the surveys were carried out on two different geographical areas and to the fact that some of the species/Families are schooling "pelagic" fish (e.g. Carangids, Leiognathids).

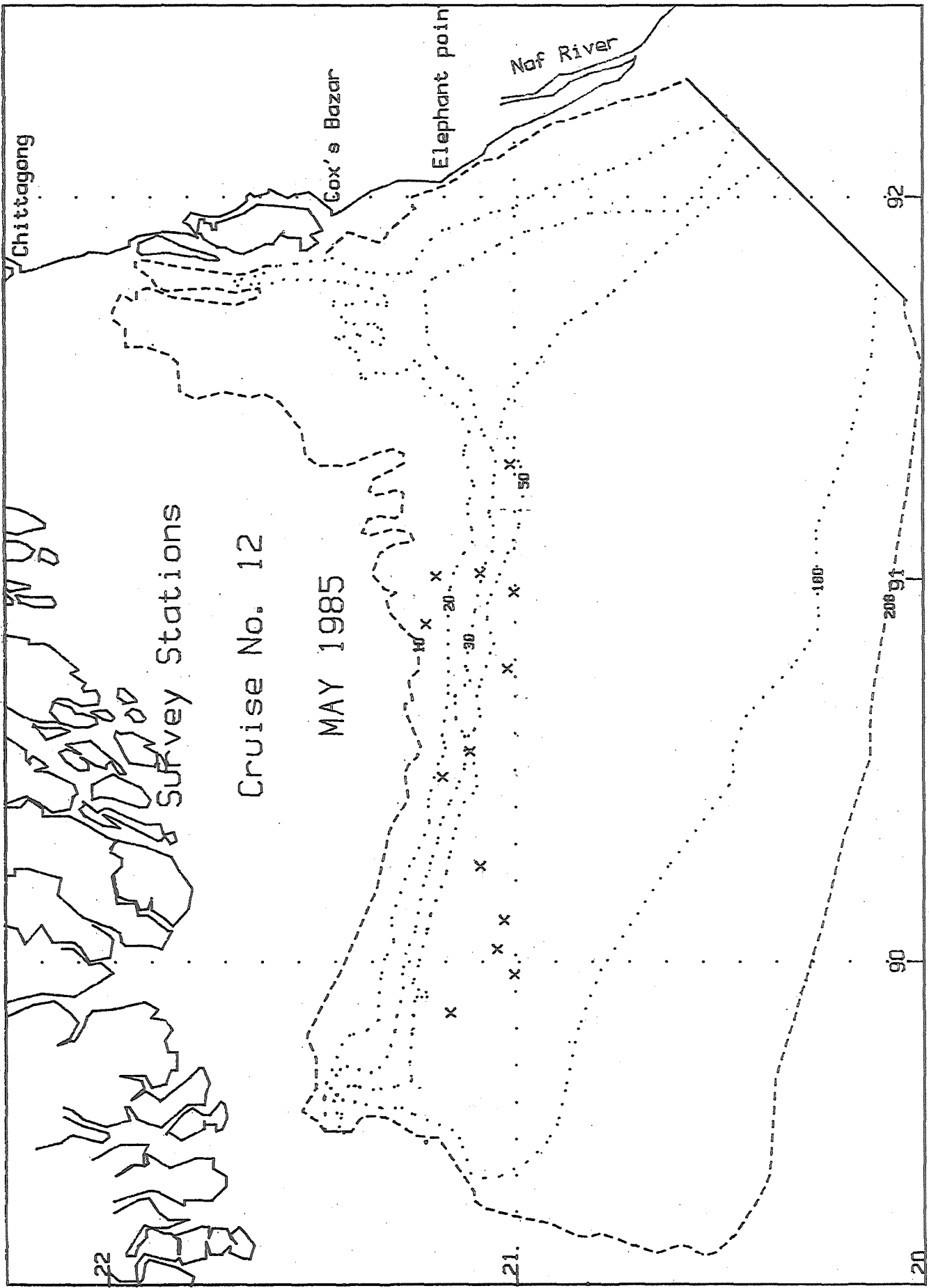


FIG. 1

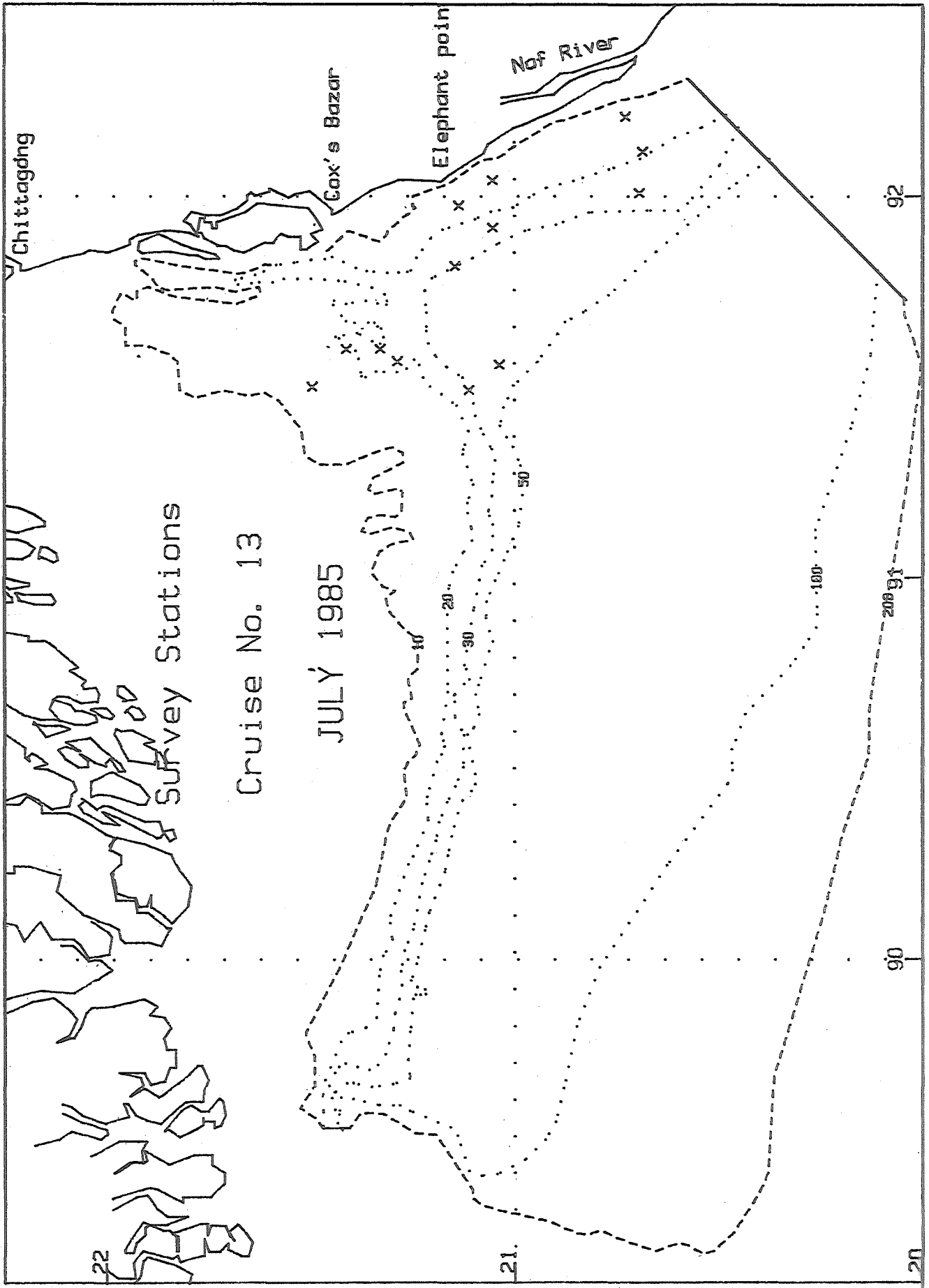


FIG. 2

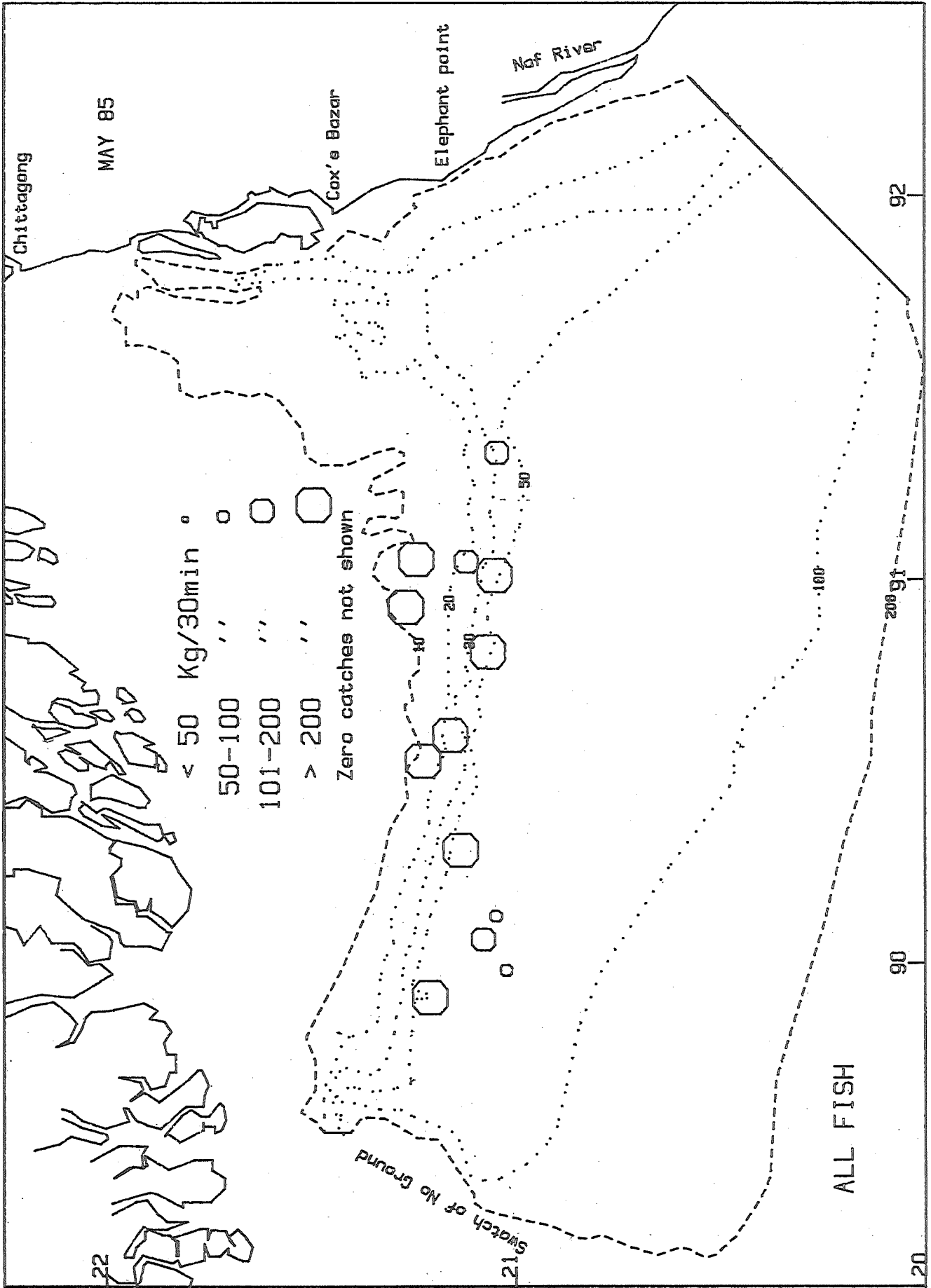


FIG. 3

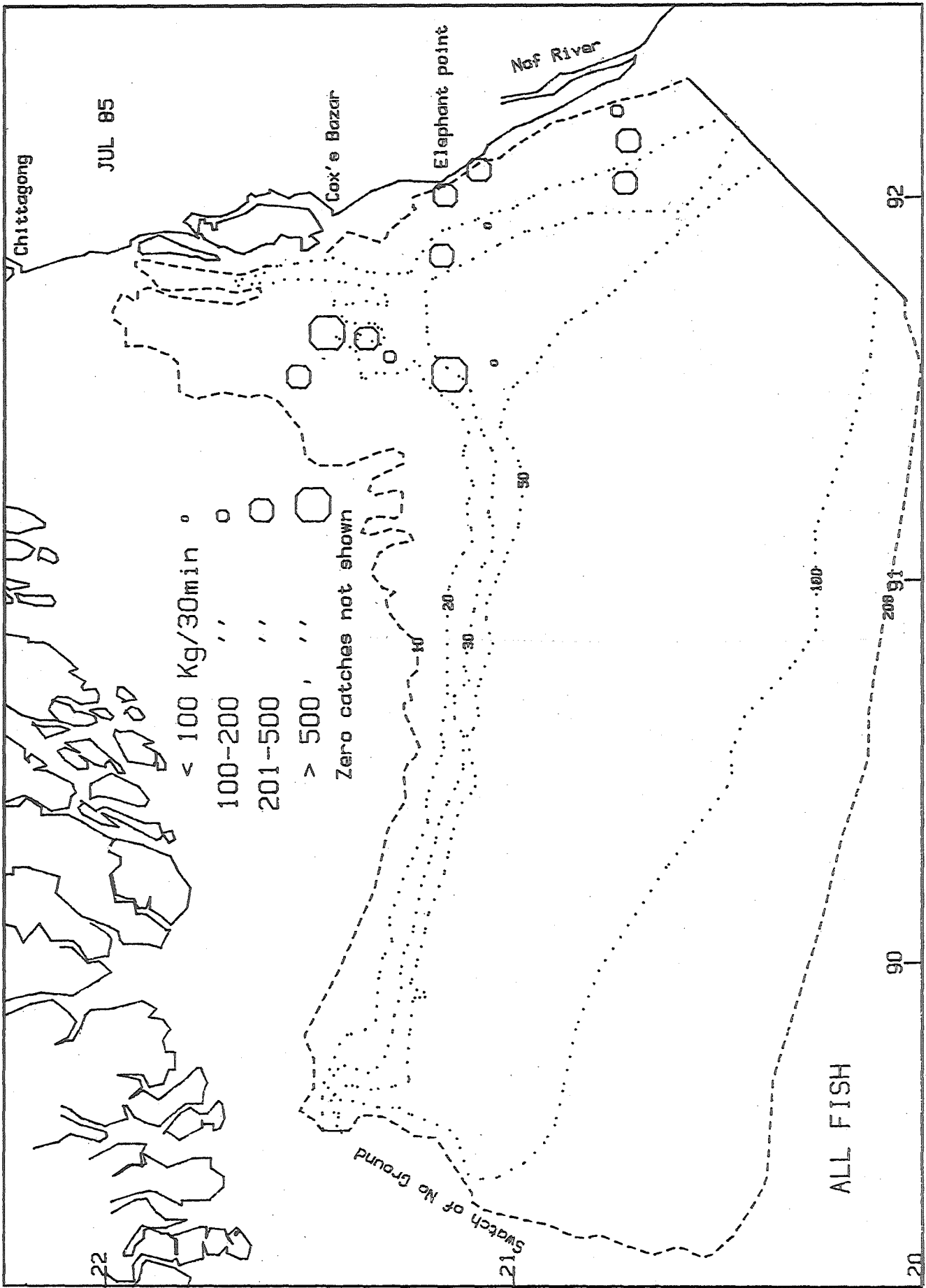
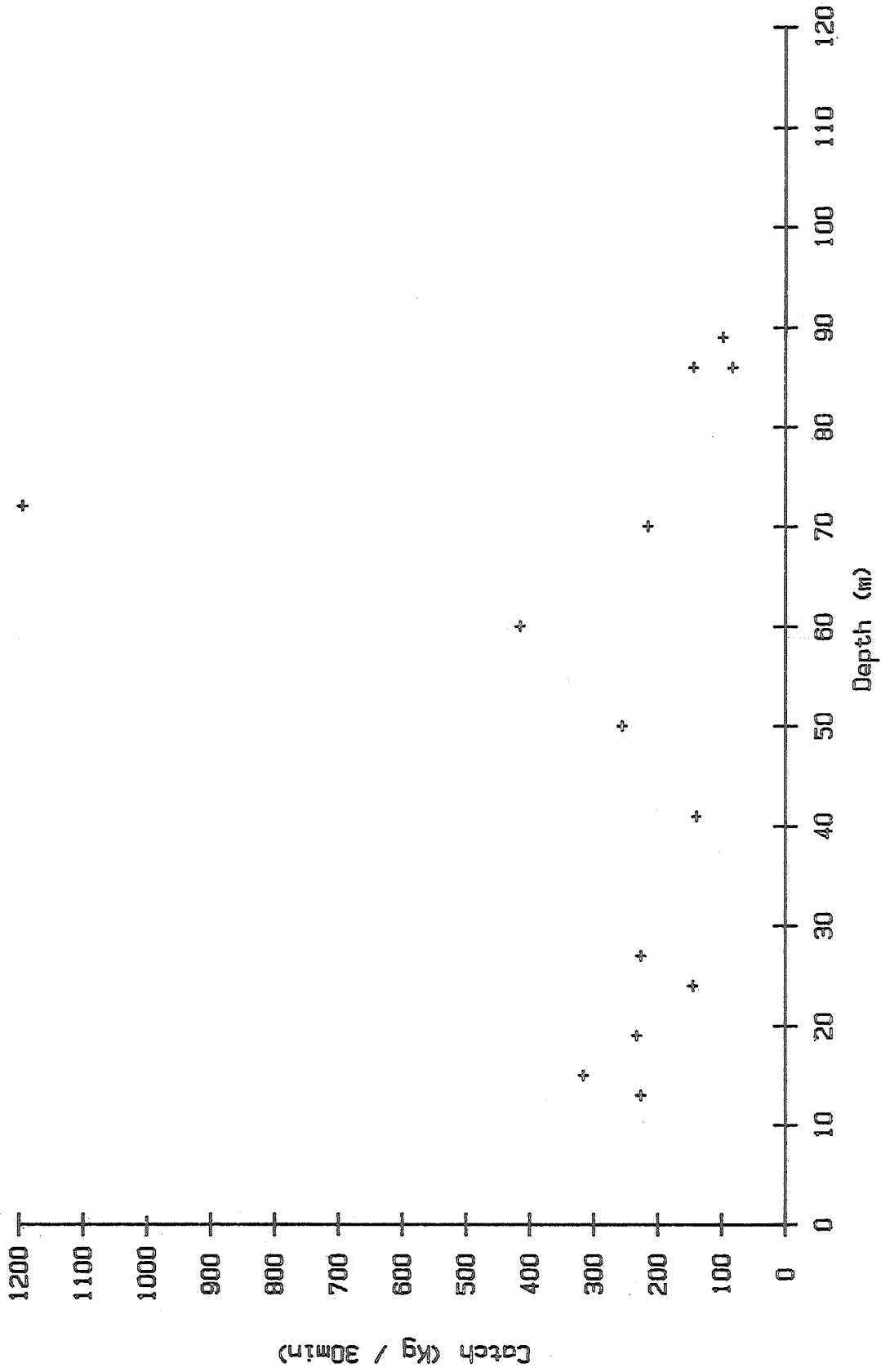


FIG. 4

ALL FISH

MAY 85



Total hauls: 13 Zero catches: 0

FIG. 5

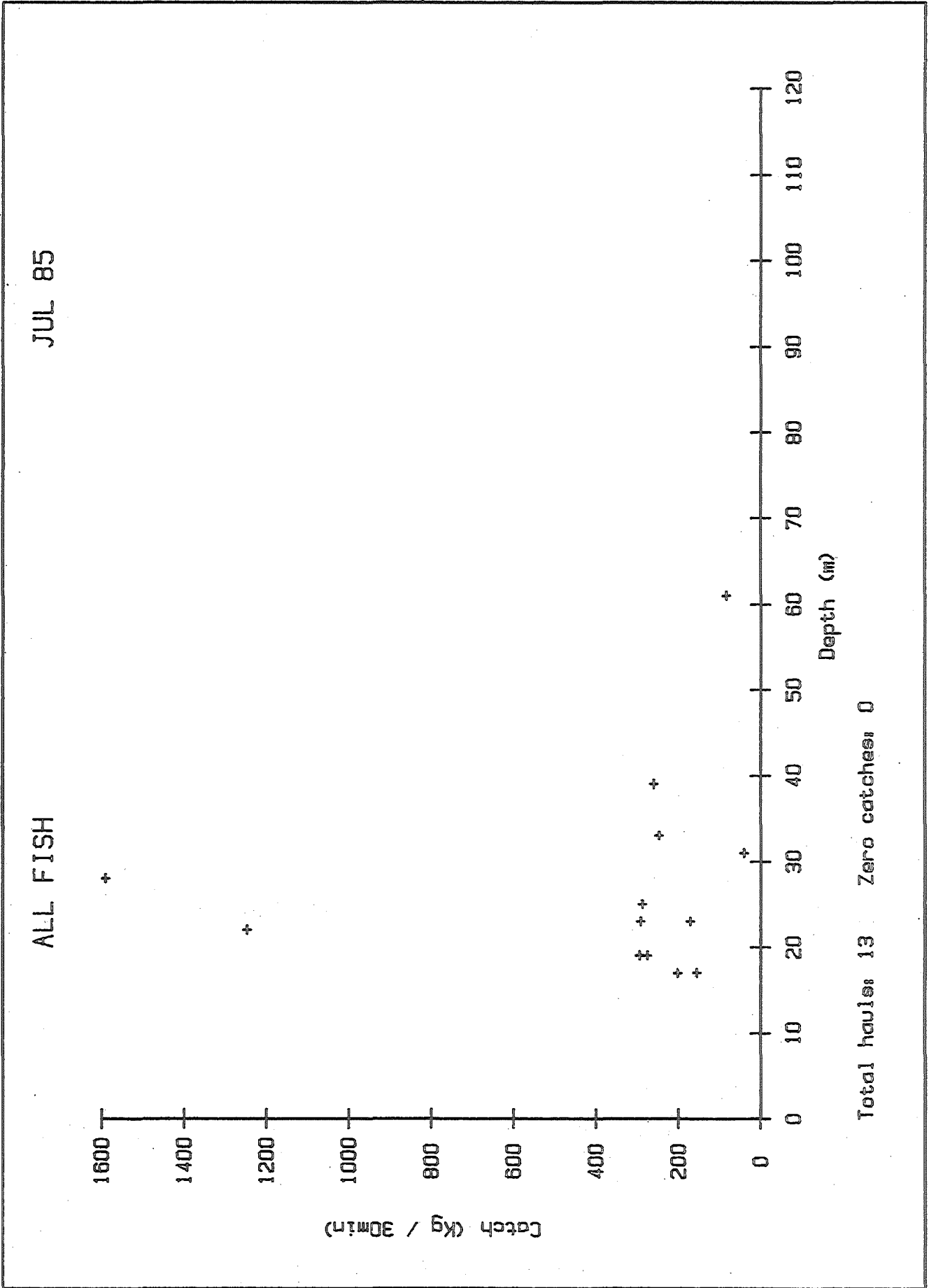


FIG. 6

Nemipterus japonicus

MAY 85

Zone 1

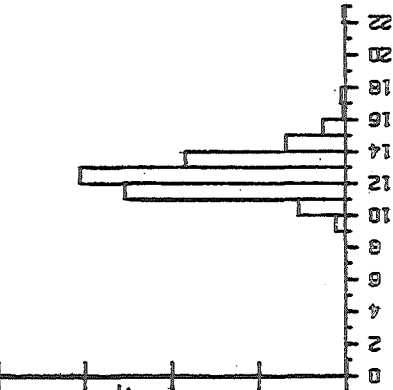
Zone 2

Zone 3

50
40
30
20
10
0

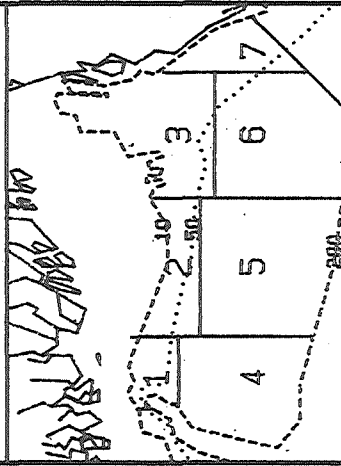
N = 390

%F



Survey area with
Length frequency

summation zones



Zone 4

Zone 5

Zone 6

Zone 7

FIG. 7

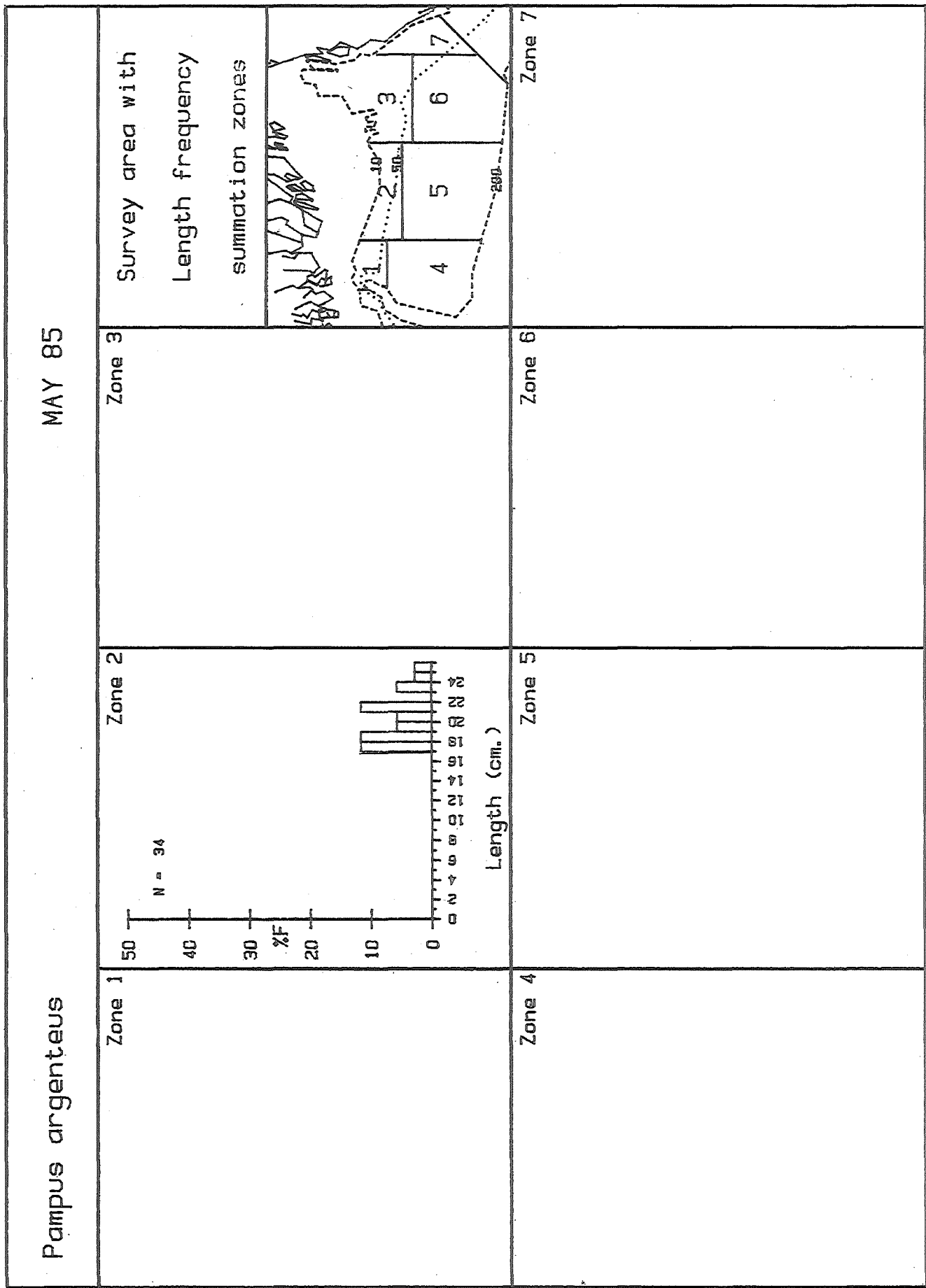


FIG. 8

Pampus argenteus

JUL 85

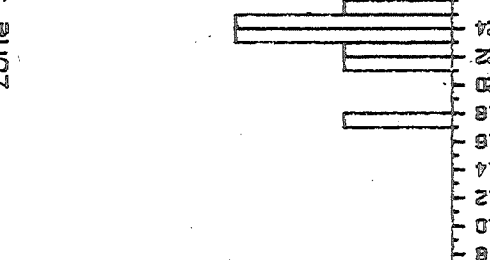
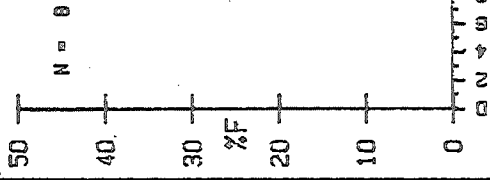
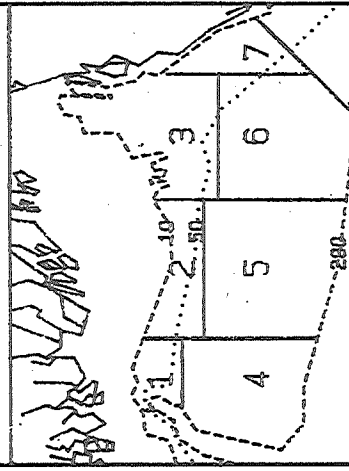
Zone 1

Zone 2

Zone 3

Survey area with
Length frequency

summation zones



Zone 4

Zone 5

Zone 6

Zone 7

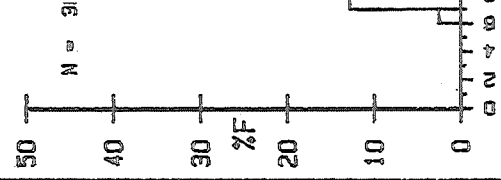


FIG. 9

Dussumeria acuta

JUL 85

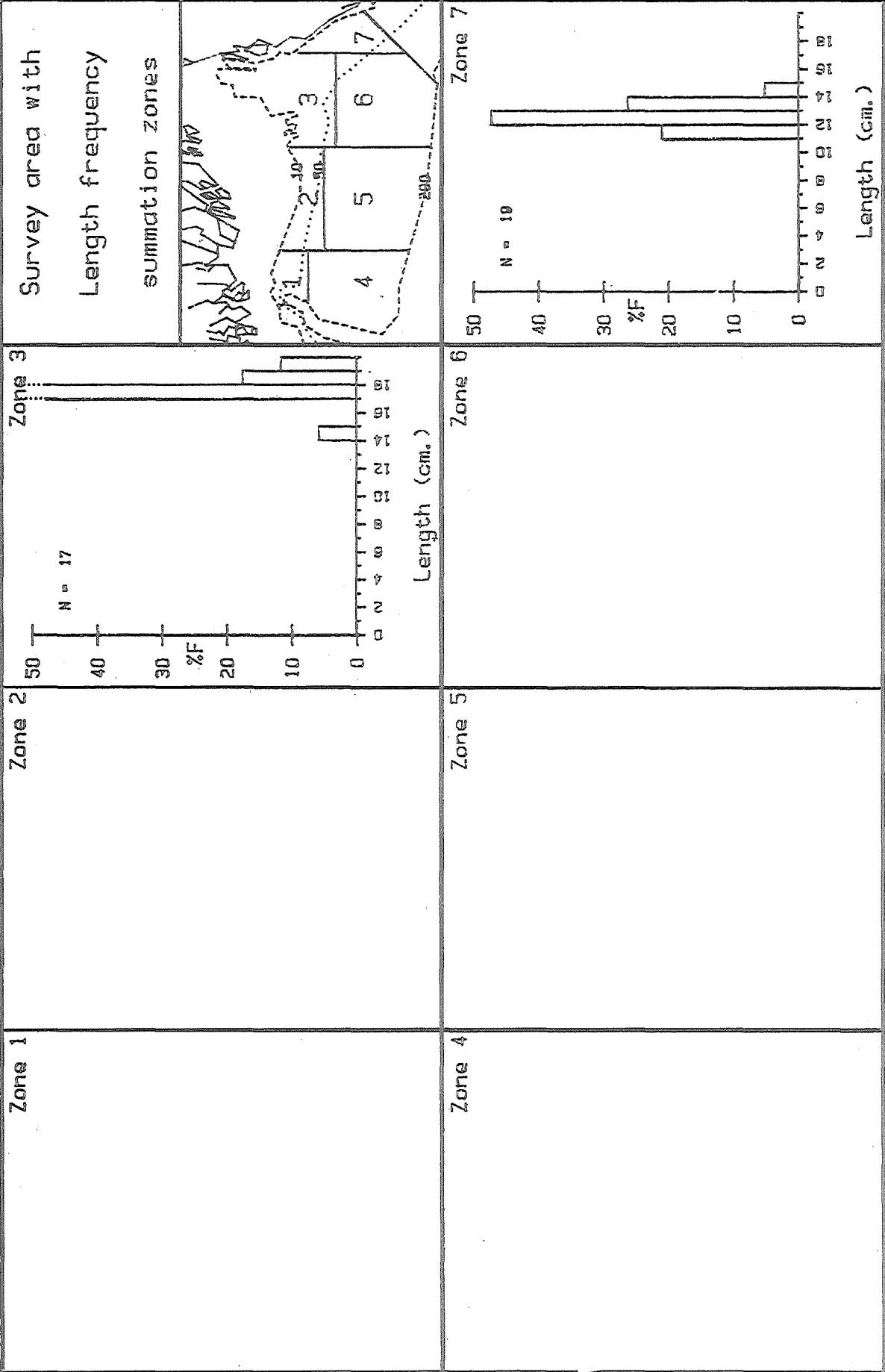


FIG. 10

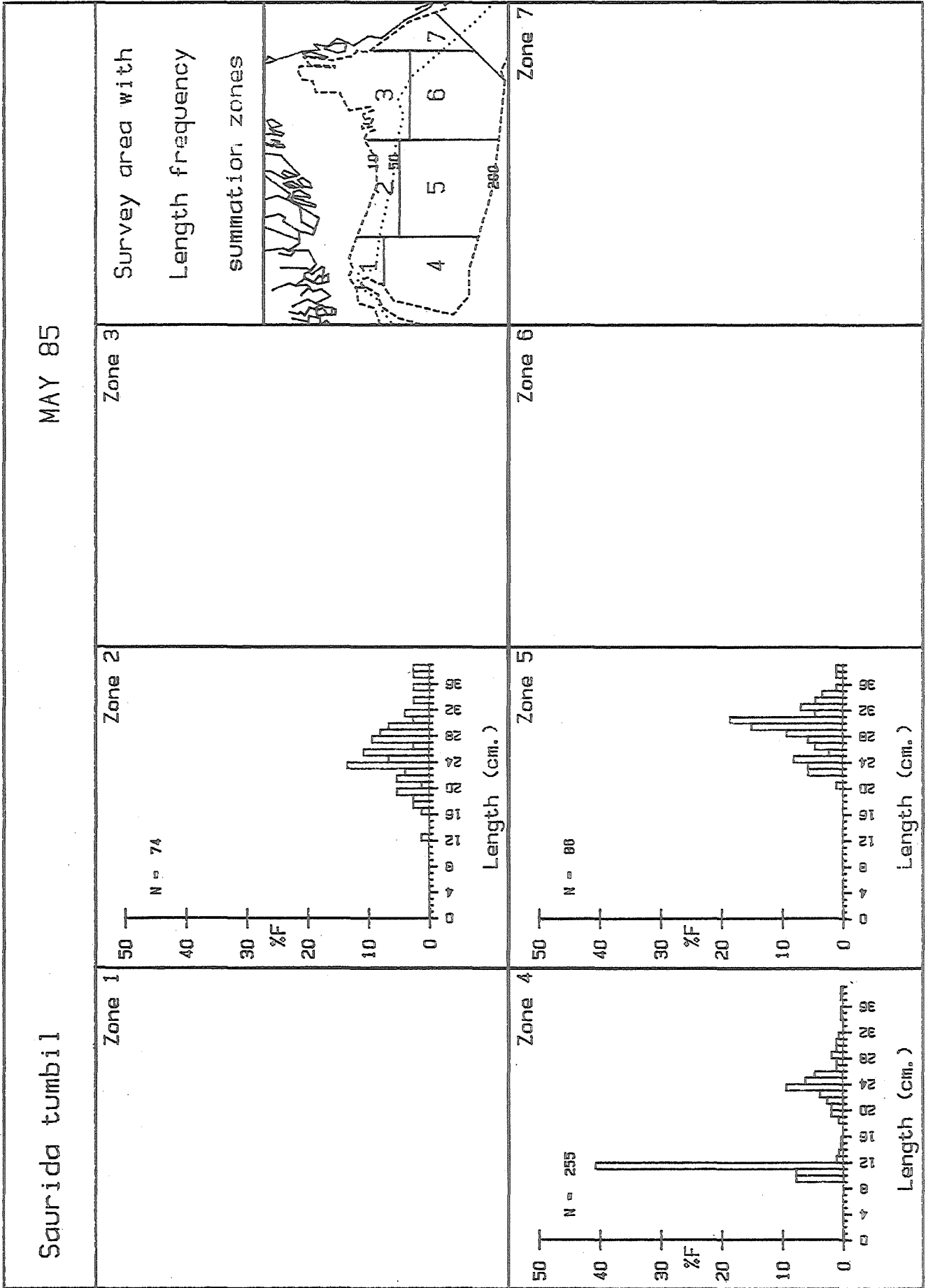


FIG. 11

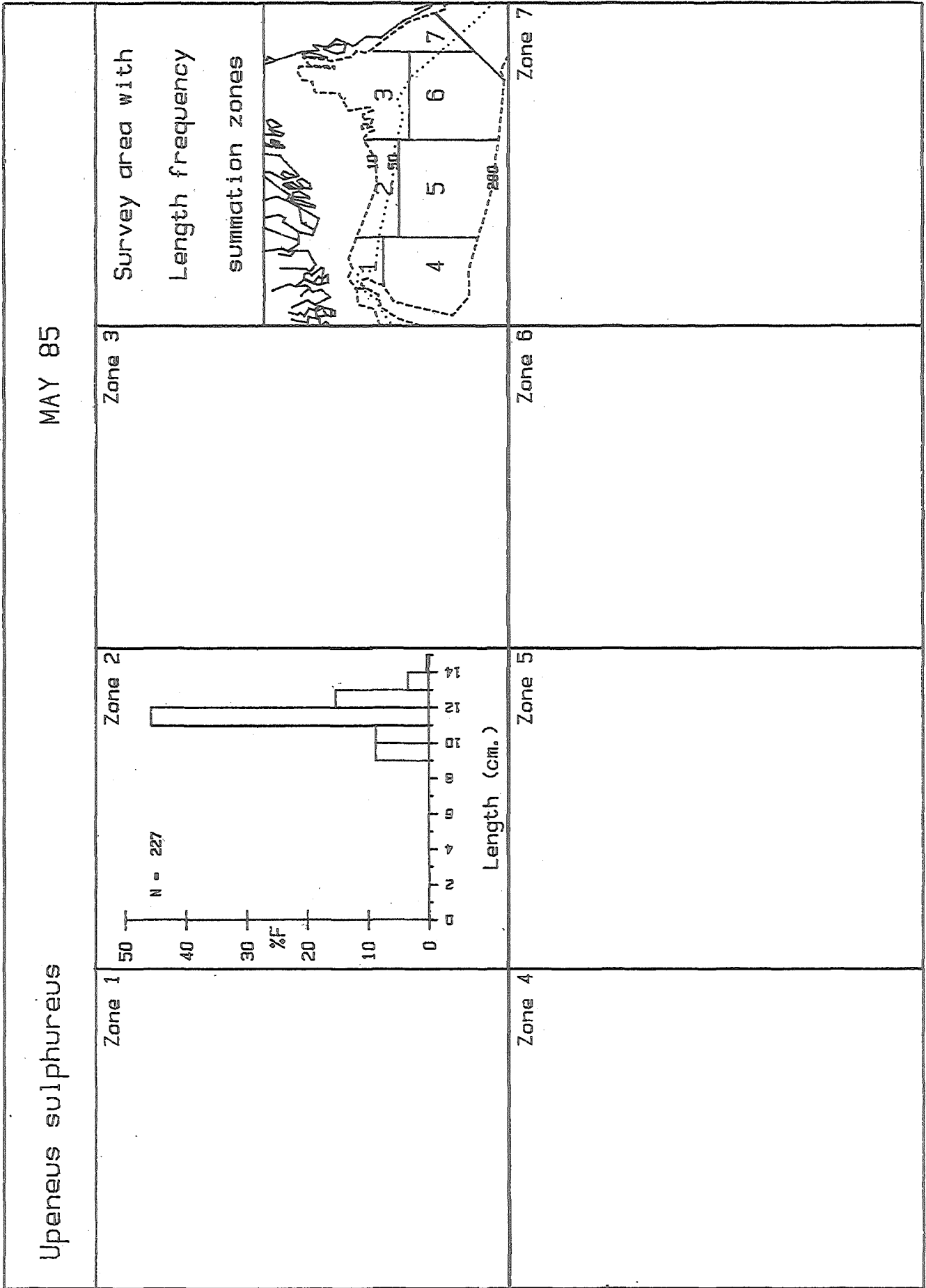


FIG.12

Pampus chinensis

MAY 85

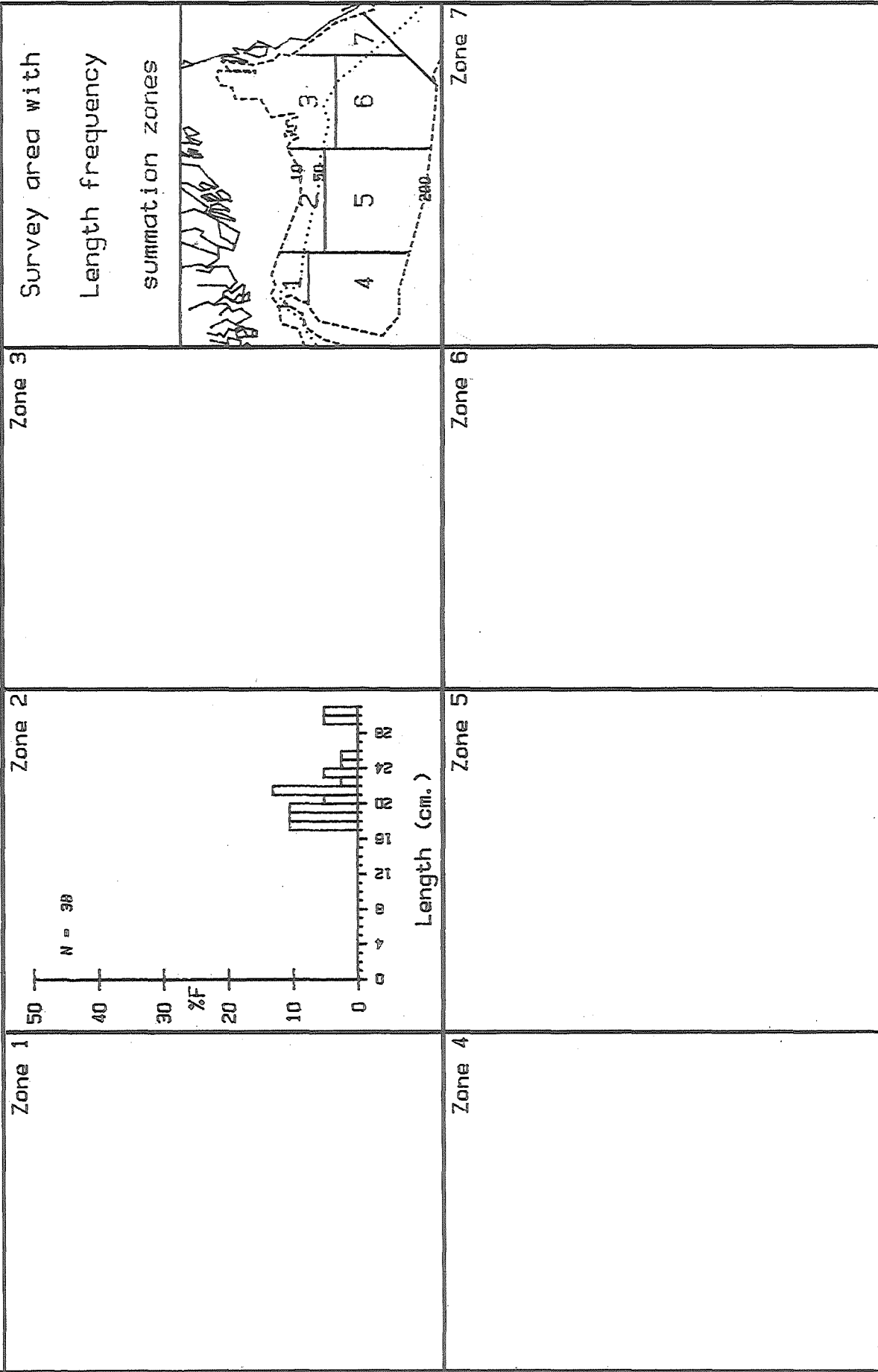


FIG. 13

Megalaspis cordyla

JUL 85

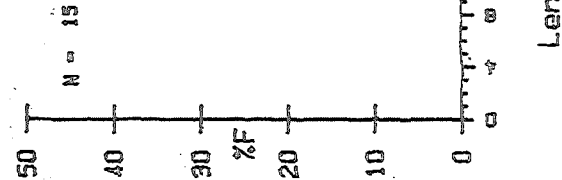
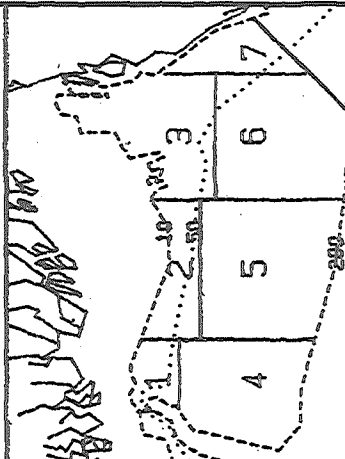
Zone 1

Zone 2

Zone 3

Survey area with
Length frequency

summation zones



Zone 4

Zone 5

Zone 6

Zone 7

FIG. 14

Parastromateus niger

JUL 85

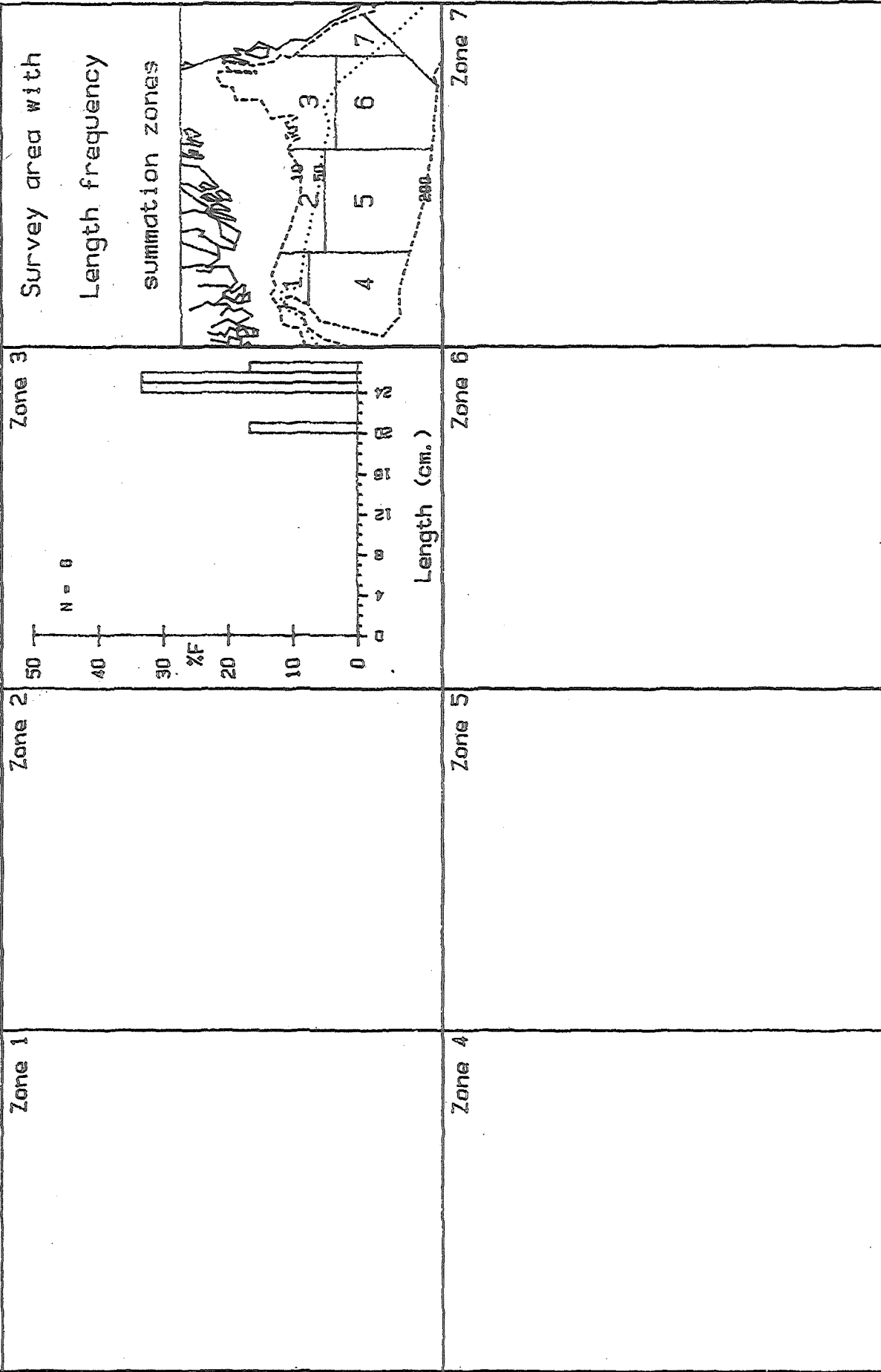


FIG. 15

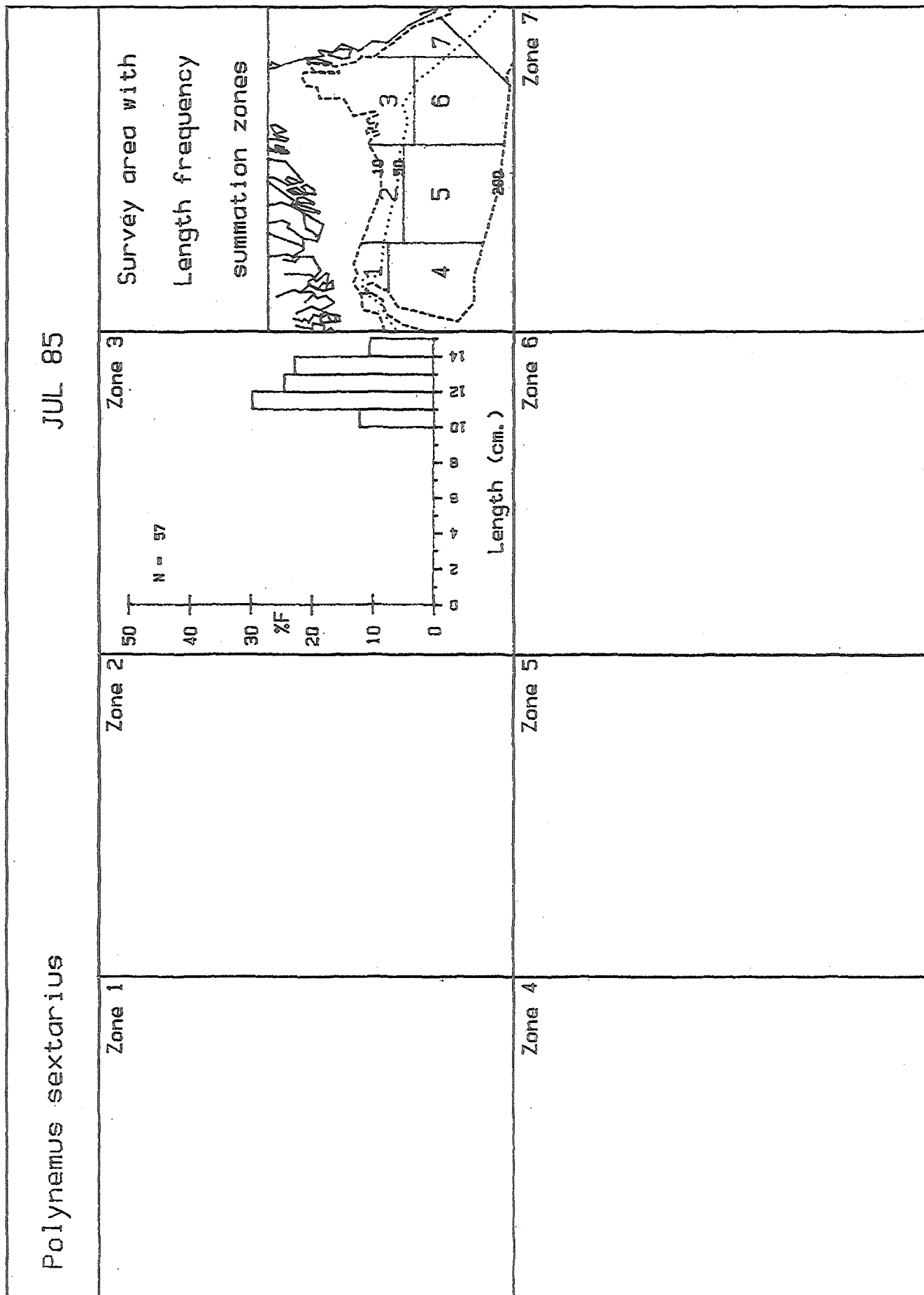


FIG. 16

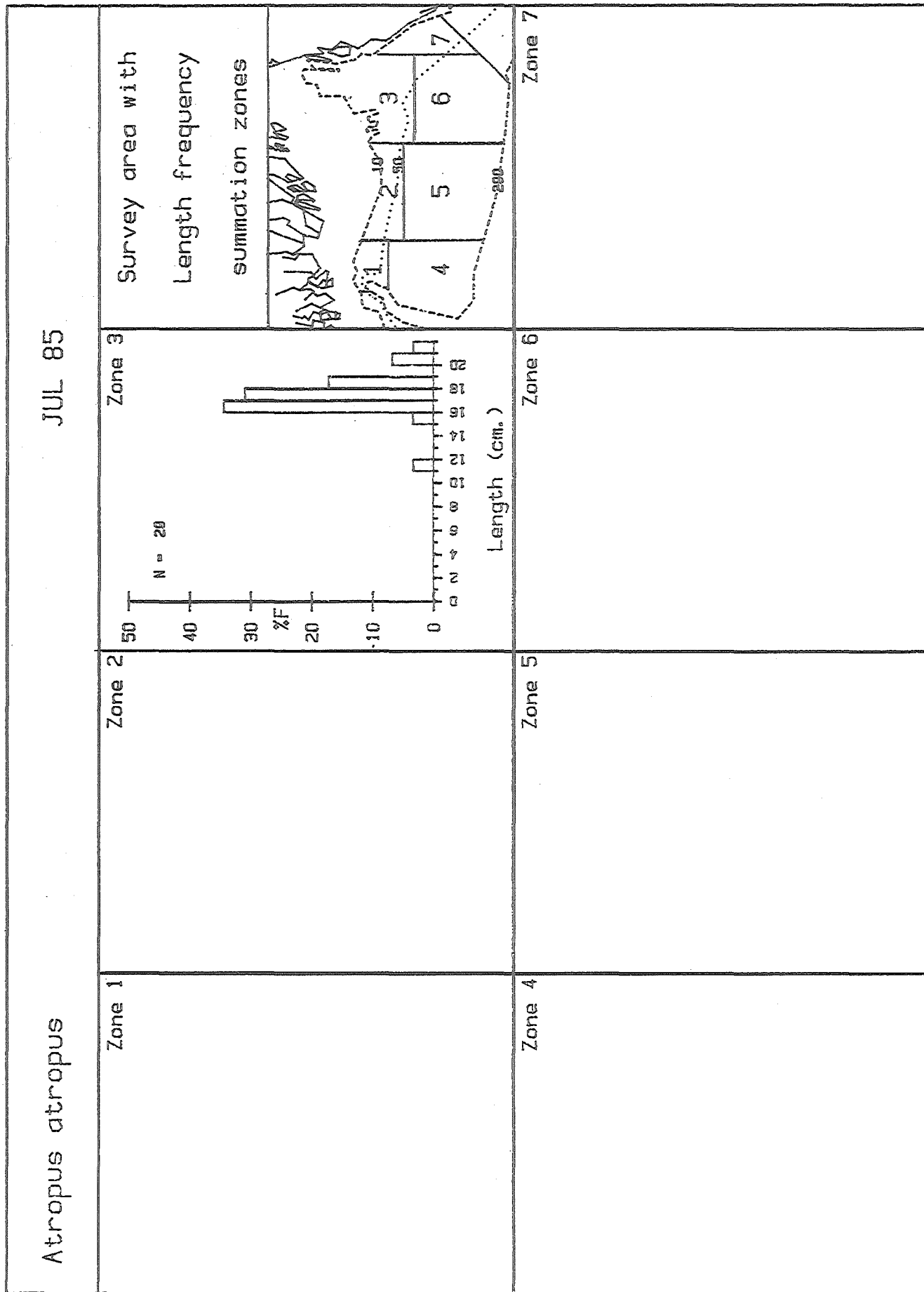


FIG. 17

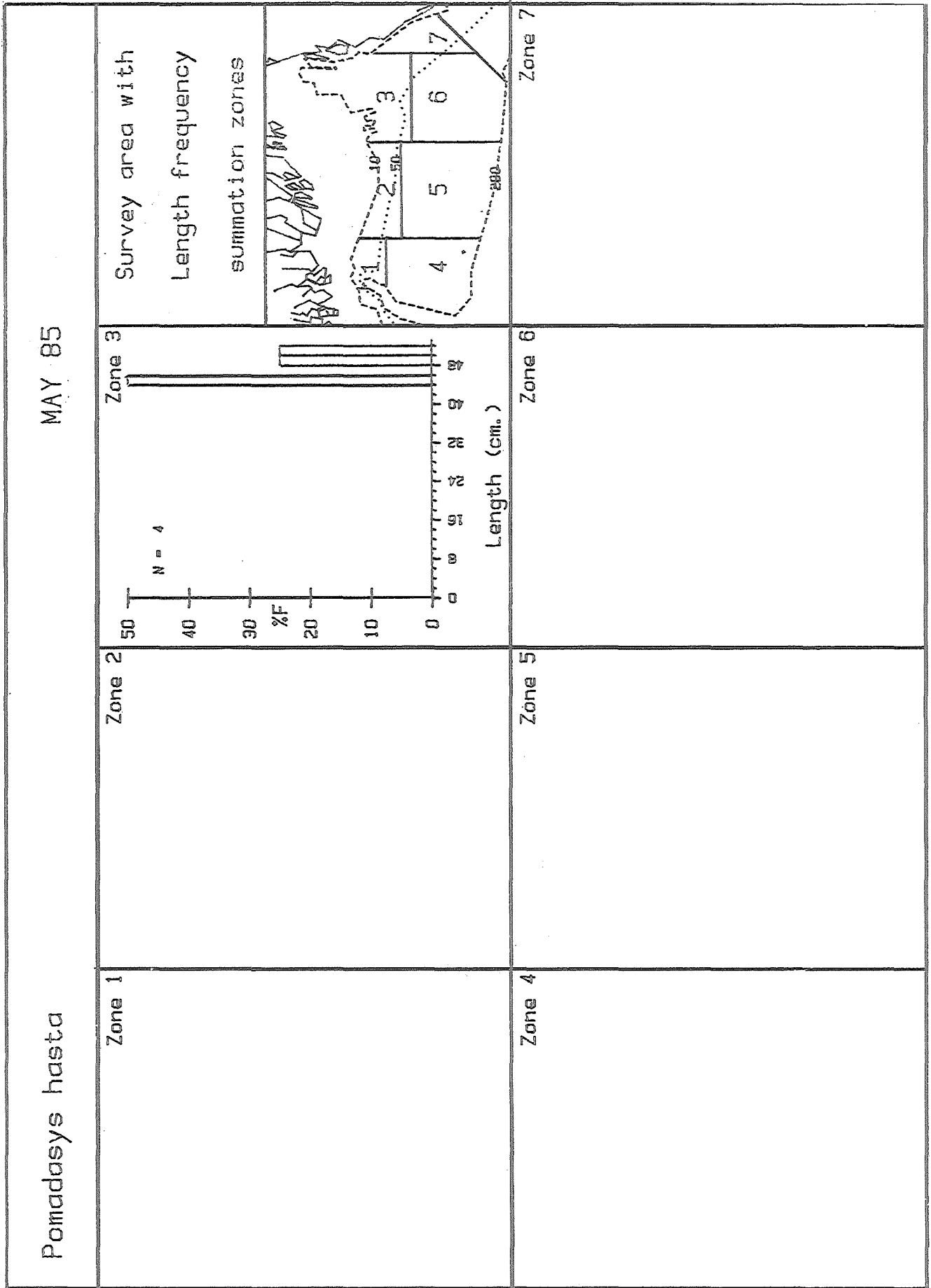


FIG. 18

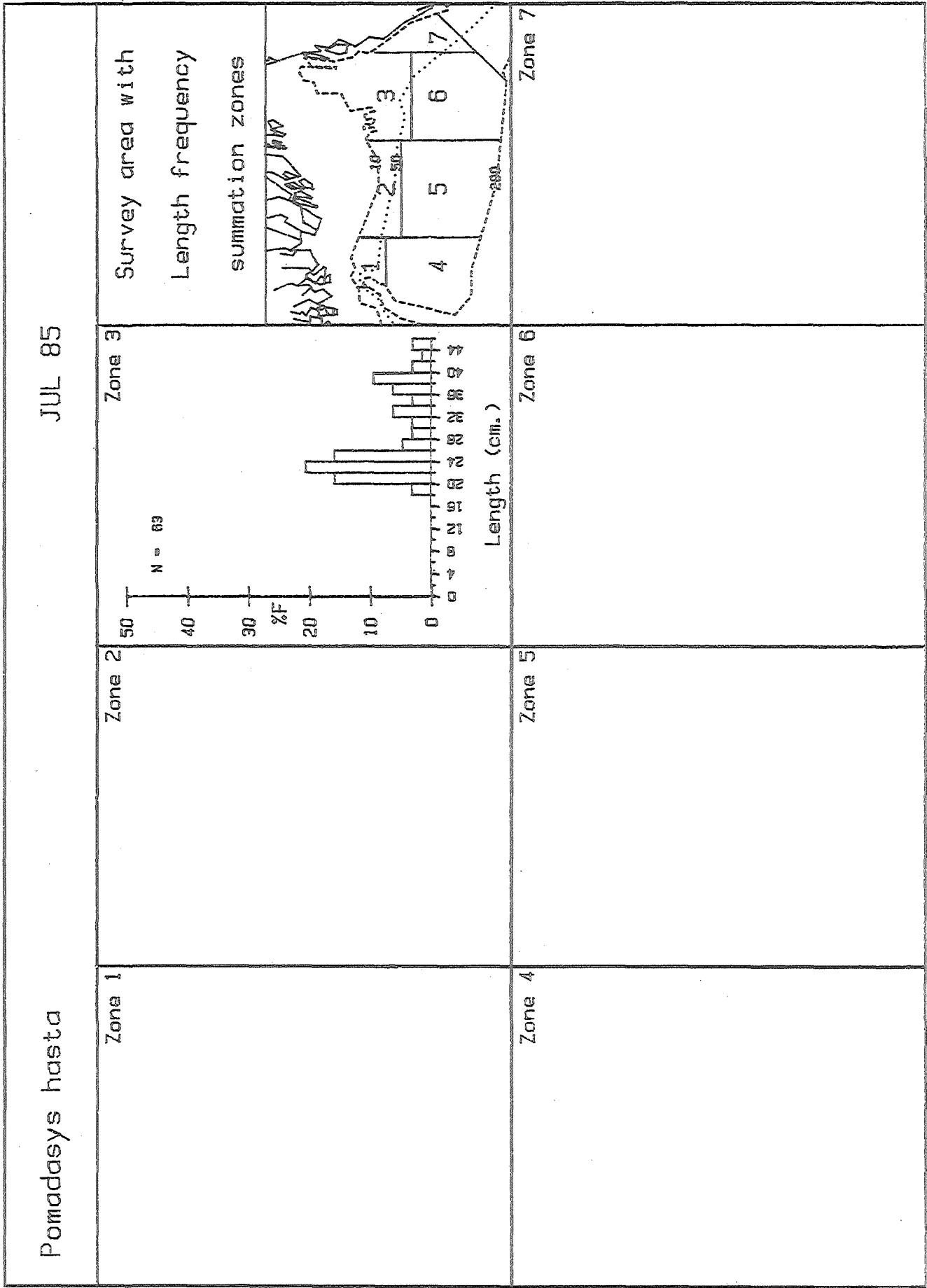


FIG. 19

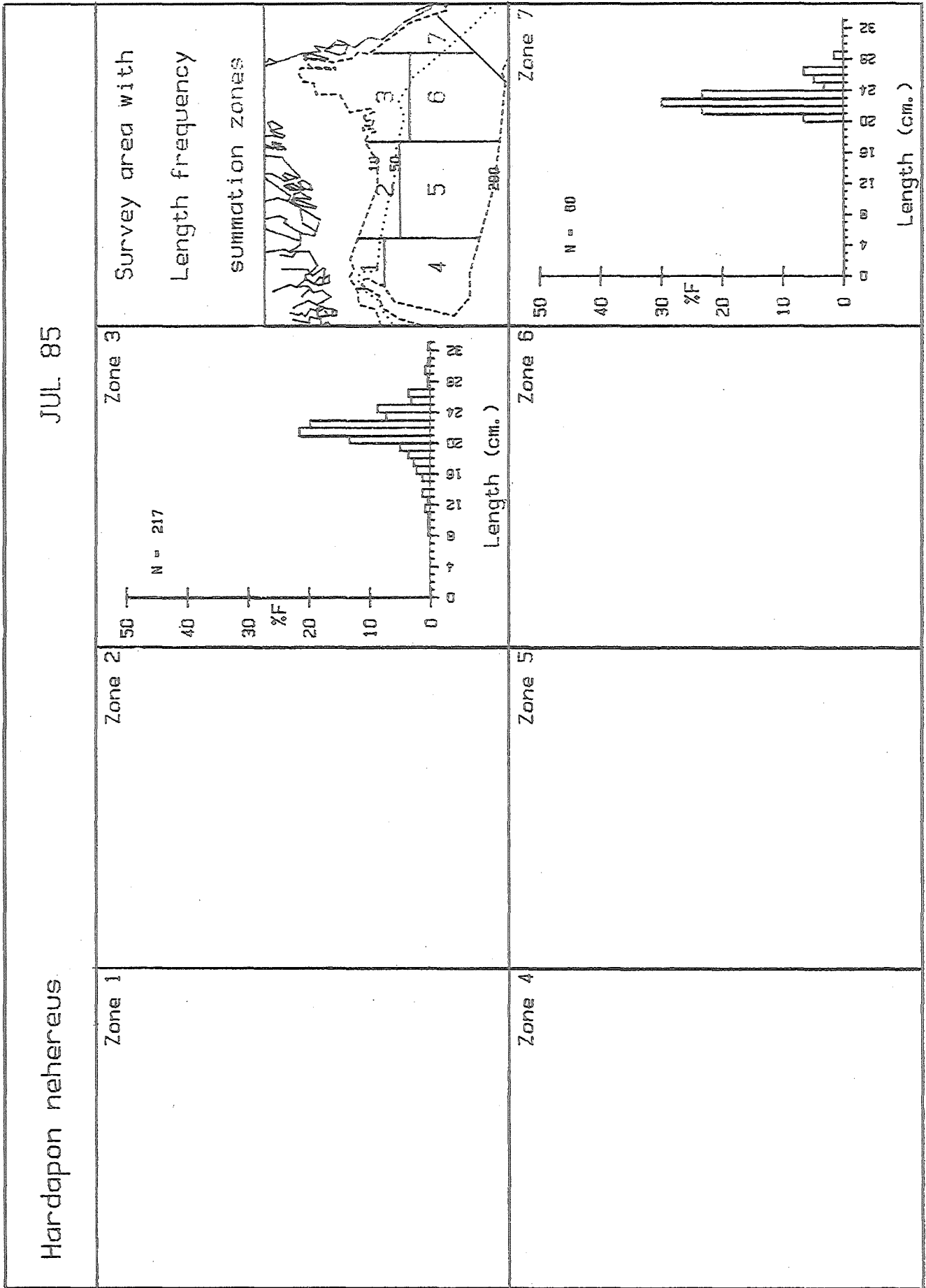


FIG. 20

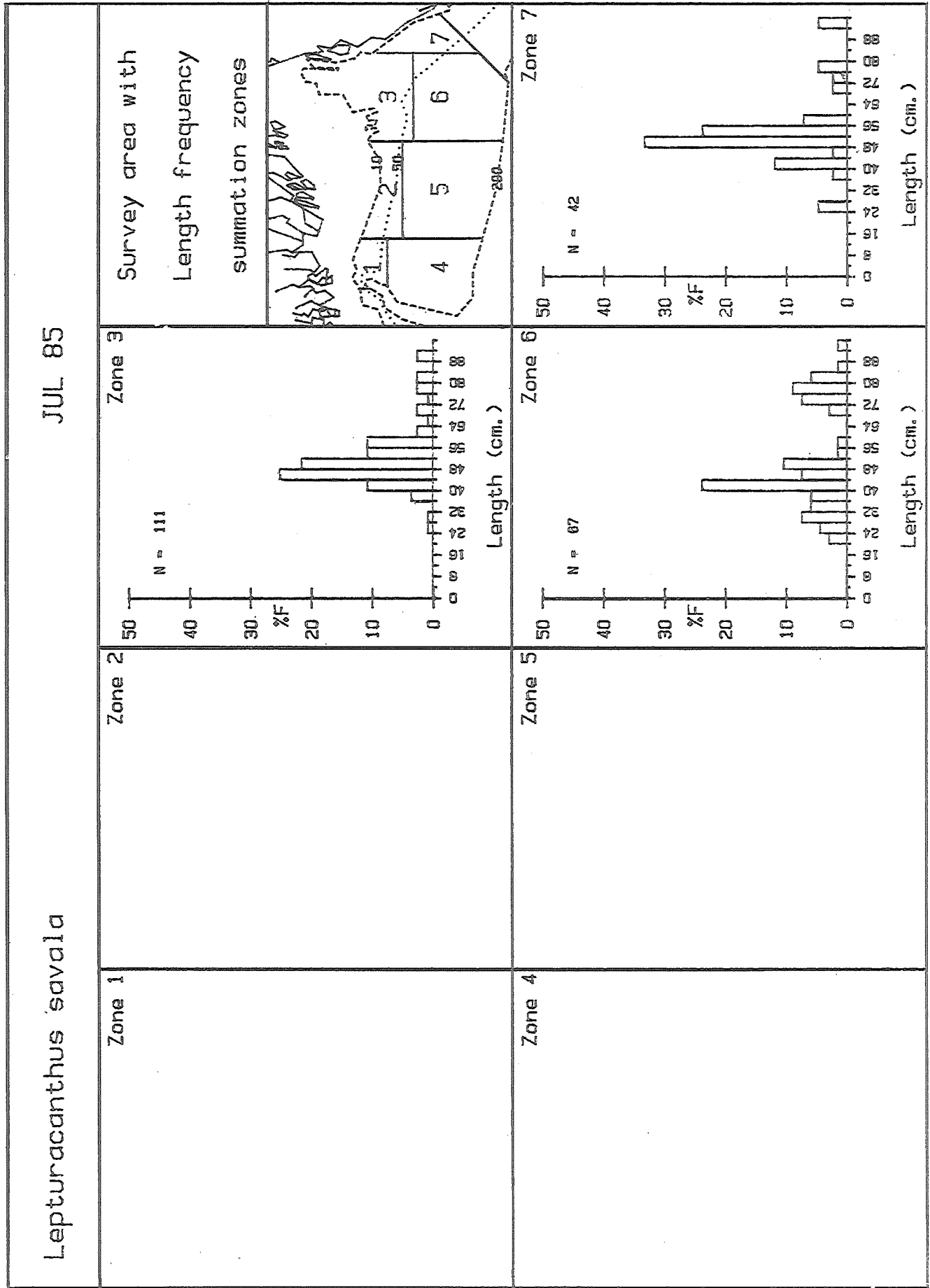


FIG. 21

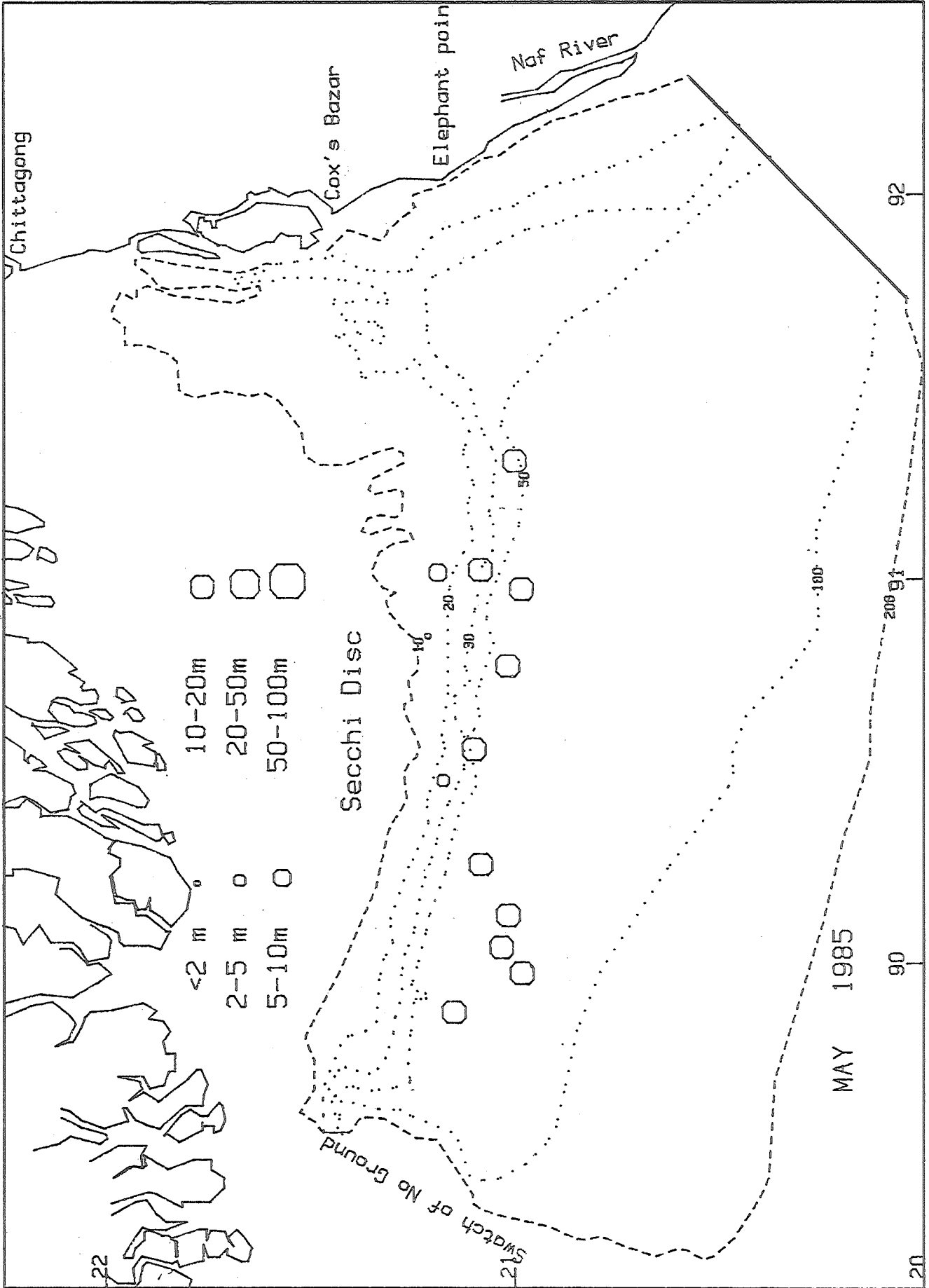


FIG. 22

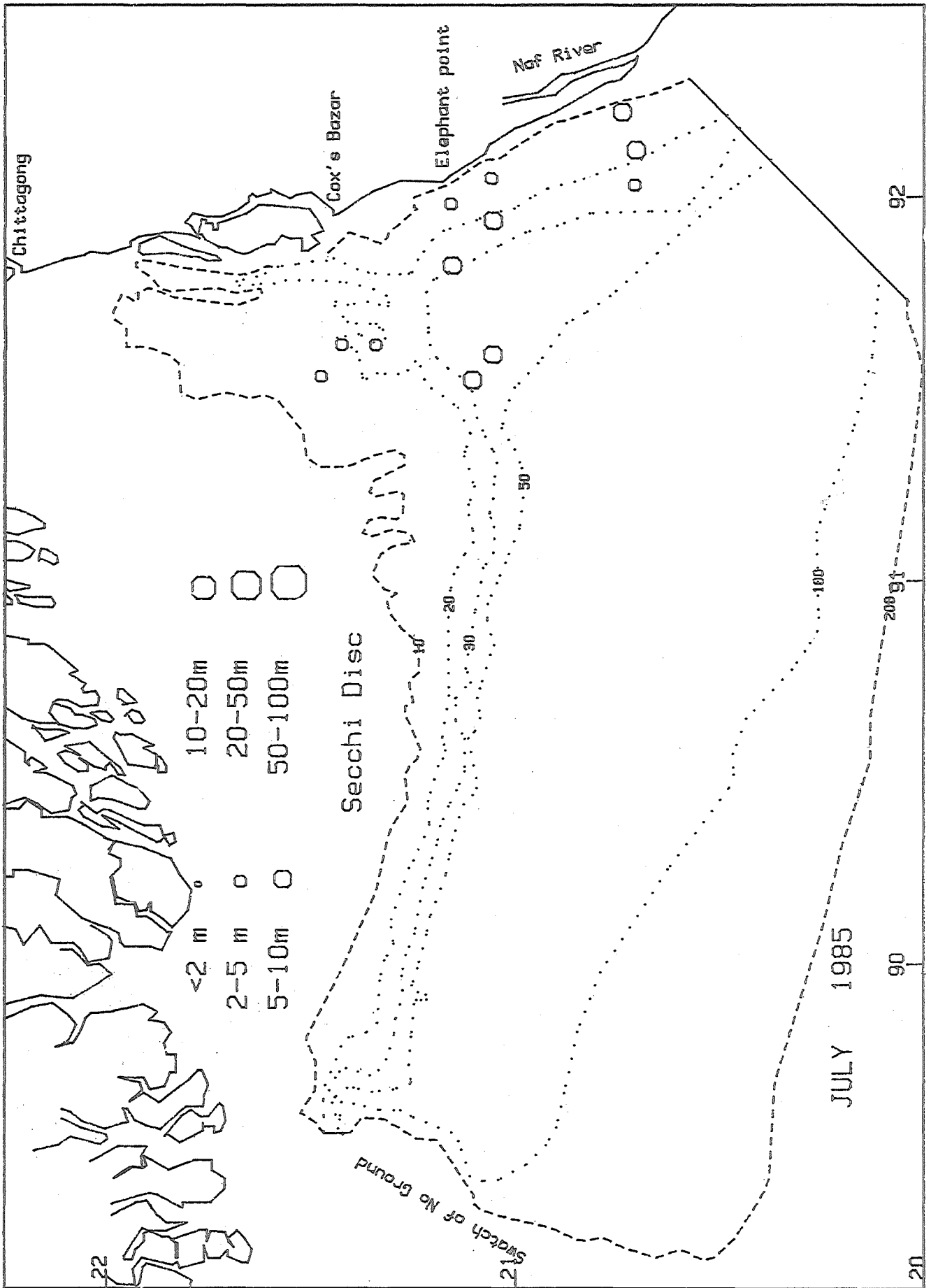
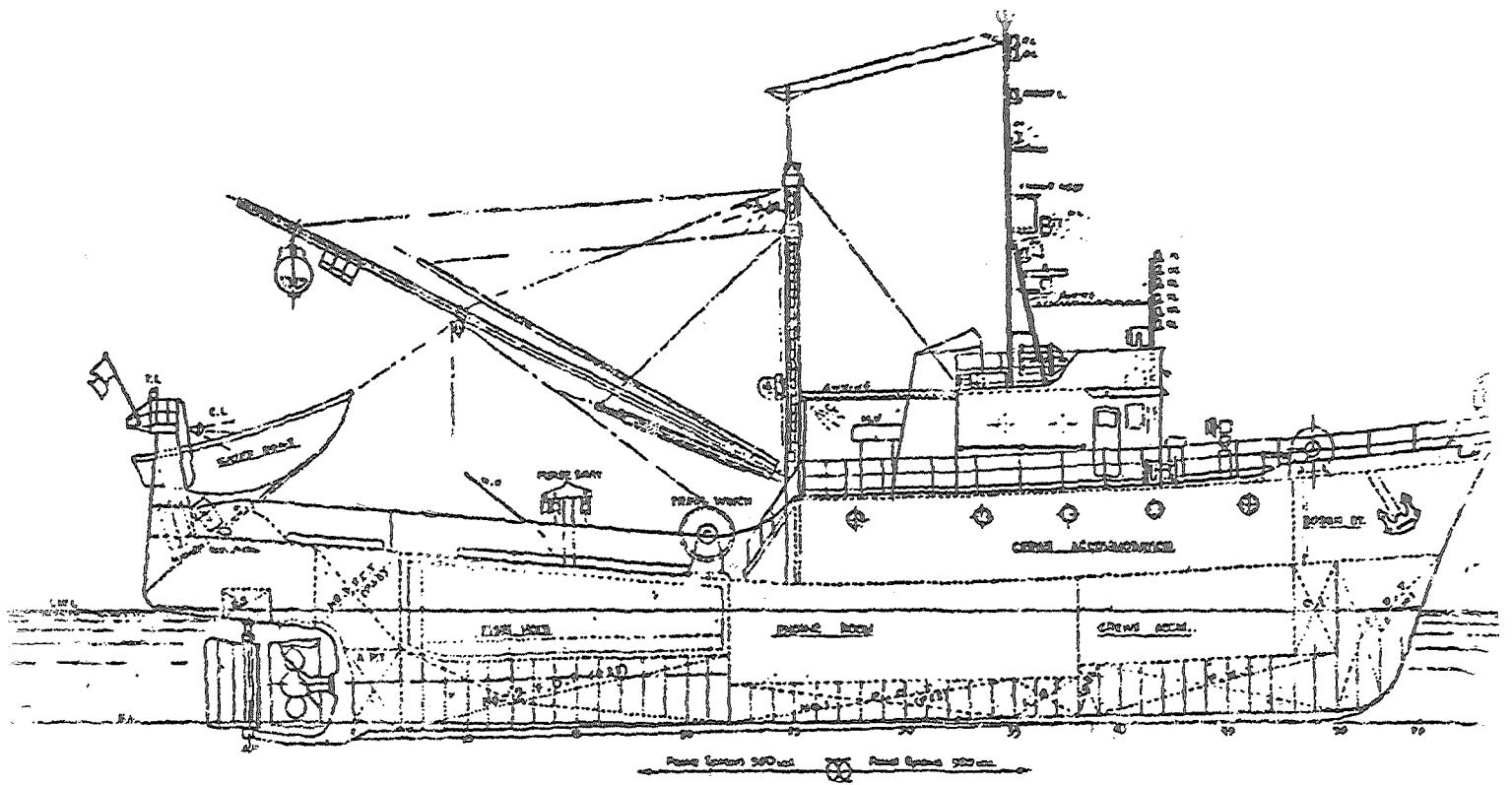


FIG. 23

APPENDIX A
RESEARCH VESSEL R/V "ANUSANDHANI"



Principal Dimension

| | |
|----------------|--------|
| Length Overall | 32.40M |
| Length B.P. | 28.00M |
| Breadth Mid | 7.50M |

| | |
|---------------|--------------|
| Depth Mid | 3.30M |
| Gross Tonnage | 221.16 G. T. |
| Main Engine | 900 PS |
| Max Trial SP | 12,44km |

Capacity

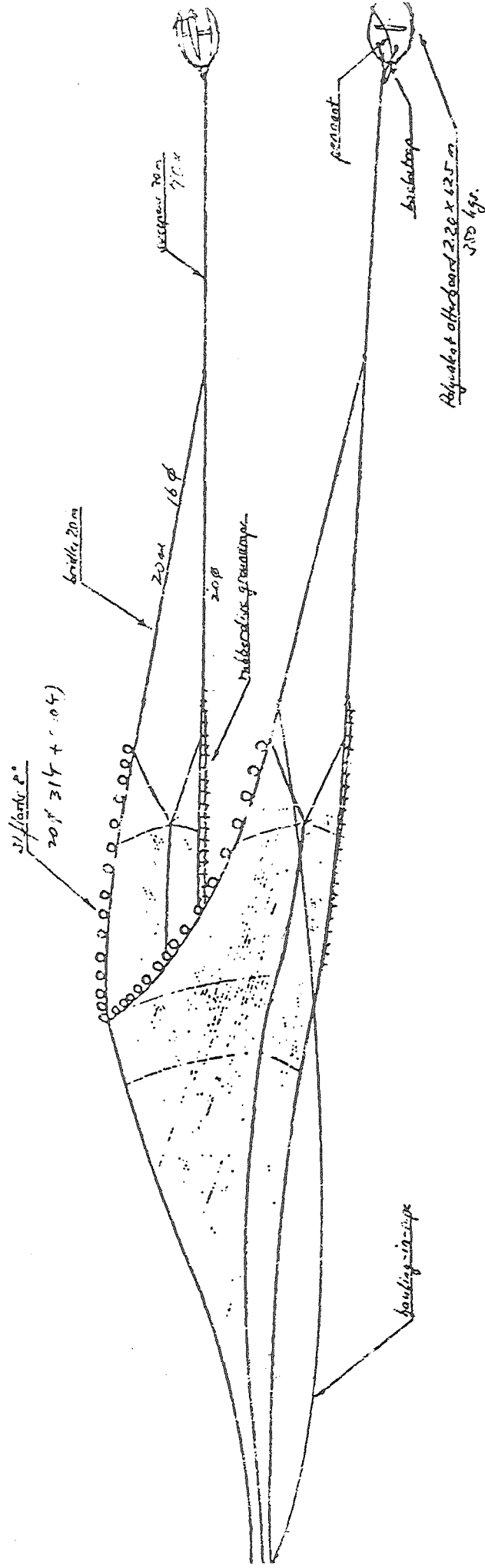
| | |
|---------------|----------------------|
| Fish Hold | 73.67 M ³ |
| Fuel Oil | 88.22 M ³ |
| Fresh water | 34.53 M ³ |
| Freezing Room | 11.17 M ³ |

Complements

| | |
|------------|-----------------|
| Officer | 6 ^P |
| Crew | 12 ^P |
| Scientists | 4 ^P |
| Total | <u>22</u> |

APPENDIX B
ENGEL HIGH OPENING BOTTOM TRAWL

GENERAL ARRANGEMENT FOR ENGEL 486 MESH HIGH
OPENING BOTTOM TRAWL



1. Headline 57.50 metres P. P. Combination wire rope 12mm dia with steel core
2. Footrope 66.30 mtrs. P. P. Combination wire rope 14mm dia with steel core
RUBBER disc Groundrope 5 X 13, 10 mtrs.

APPENDIX C
SURVEY LOG SHEETS



FISHING LOG



| | | |
|-----|-------|------|
| DAY | MONTH | YEAR |
| | | |

| | |
|---------------|--|
| CRUISE NUMBER | |
|---------------|--|

| | |
|----------------|--|
| STATION NUMBER | |
|----------------|--|

| | |
|------------------------|--|
| SURVEY POSITION NUMBER | |
|------------------------|--|

| | | | |
|-------------|--|--|--|
| VESSEL NAME | | | |
|-------------|--|--|--|

| | | | |
|-----------|--|-------------------|--|
| GEAR TYPE | | COD END MESH SIZE | |
|-----------|--|-------------------|--|

LOCAL TIME

LATITUDE AND LONGITUDE

| TIME SHOT | TIME HAULED | DIRECTION | BOTTOM DEPTH (m) | | FISHING DEPTH (m) | | POSITION OF SHOOTING | | POSITION OF HAULING | | DISTANCE TRAVELLED N.M. | |
|-----------|-------------|-----------|------------------|---|-------------------|---|----------------------|---|---------------------|---|-------------------------|---|
| | | | S | H | S | H | ° | ' | ° | ' | | ° |
| | | | | | | | | ° | ' | ° | ' | |
| | | | | | | | | N | E | N | E | |

| DECCA Readings Shooting | | | DECCA Readings Hauling | | |
|-------------------------|---|---|------------------------|---|---|
| R | G | P | R | G | P |

| | |
|----------------|--|
| SAMPLE BASKETS | |
|----------------|--|

| | |
|---------------|--|
| TOTAL BASKETS | |
|---------------|--|

HAUL VALIDITY

| |
|----------------------------|
| FOR VALID HAUL ENTER 1 |
| FOR NON-VALID HAUL ENTER 0 |

COMPOSITION OF TOTAL CATCH

| SPECIES | CODE | NUMBER | WEIGHT (kg) |
|---------|------|--------|-------------|
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| SPECIES | CODE | NUMBER | WEIGHT (kg) |
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REMARKS: (DETAILS OF GEAR DAMAGE ETC.)

| | |
|----------------------|--|
| SAMPLE TOTAL WT (kg) | |
|----------------------|--|

SCIENTIST I/C

MARINE FISHERIES RESEARCH, MANAGEMENT AND DEVELOPMENT PROJECT (BGD/80/025)



BIOLOGICAL SAMPLING SHEET



sheet of

| | | | | | |
|---------|-------------|------------------|--------------|-------|------|
| SPECIES | VESSEL NAME | NUMBER OF SAMPLE | DATE SAMPLED | | |
| | | | DAY | MONTH | YEAR |

| | | |
|---------------|----------------|-------------|
| CRUISE NUMBER | STATION NUMBER | HAUL NUMBER |
|---------------|----------------|-------------|

| FISH No. | LENGTH (mm) | WEIGHT (g) | SEX M. or F. | MATURITY | AGE | REMARKS | | | | |
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SCIENTIST I/C

