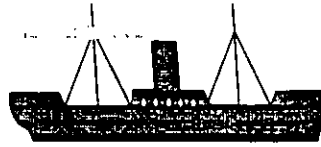


DEPARTMENT OF AGRICULTURE [NI]  
AGRICULTURAL AND ENVIRONMENTAL SCIENCE DIVISION  
(Aquatic Systems Group)



CRUISE REPORT - LF/25/96

NW IRISH SEA NEPHROPS STOCKS: 17-21 June 1996

PERSONNEL

R. Briggs, PSO [SIC]  
M. Service SSO  
M. McAliskey, SO  
J. Peel, ASO  
C. Burns, ASO  
N. McQuaid, RA

OBJECTIVES

- To trawl selected stations sampled during earlier cruises and perform qualitative and quantitative analysis of catches.
- To assess the incidence of the dinoflagellate parasite *Hematodinium* in *Nephrops* catches.
- To film substrate transects over the *Nephrops* grounds using underwater video and sledge.
- To carry out a survey of the *Nephrops* grounds using the ground discrimination system RoxAnn..

METHODS

Trawls of 30 to 60 minutes duration were performed at each station as shown in Figure 1 using a custom made *Nephrops* net of nominal mesh size 50mm. Catch bulk was quantified by counting baskets filled from the catch. Sample baskets of catch were sorted to provide an assessment of species composition. The *Nephrops* in each sub-sample were divided into male and female components and the ovary maturity stage of the females noted. Carapace length frequency distributions of both male and female *Nephrops* were measured and the number of recently moulted (soft shelled) animals counted. Whole animals were examined from all stations for the prevalence of the parasitic dinoflagellate *Hematodinium*. *Nephrops* tissue samples were taken for future diagnostic examination using histological and immunostaining techniques. The contribution of all finfish catches was quantified and their length compositions measured. Sampling procedures were similar to those used during whitefish cruises. The underwater video camera and sledge were deployed over the stern of the ship while vertical video and grab sample hauls were made over the ship's starboard side. RoxAnn was run continuously throughout the cruise and two overnight survey grids over the *Nephrops* grounds were completed.

## NARRATIVE

### Sunday 16 June:

Scientific staff boarded the vessel and a pre-cruise briefing included a safety demonstration by the Fishing Master. *R.V. Lough Foyle* sailed at 23h.30 and proceeded to the northern limit of the *Nephrops* grounds (Figure 1).

### Monday 17 June:

The video camera and sledge were deployed in calm weather conditions at Station 2 (Figure 1) and good film of the bottom substrate was obtained. The same area was then fished, but catches were poor. Better catches were made at Stations 109 and 17. Sediment grab samples were taken at the end of each station. A camera transect was performed at station 17 but resolution was poor compared to the morning session. The night was spent at anchor in Dundalk Bay.

### Tuesday 18 June:

The trawl net was shot at 07h.15 at station 207 and was followed by a camera tow in the same area. Good film of *Nephrops* burrows was obtained at station 8 which was then fished before the vessel moved south to station 105 where an evening camera tow was performed. The night was spent completing a survey grid with RoxAnn over the southern part of the *Nephrops* Grounds.

### Wednesday 19 June:

Work commenced with a trawl tow at station 105. The seabed at this station was hard and occupied by a wide range of invertebrates not normally encountered on *Nephrops* grounds. Camera and trawl tows were then performed at stations 104 and 106. The evening was spent completing a camera tow over station 103 which is near to the eastern limit of the *Nephrops* grounds. *Nephrops* and their burrows were observed, but at a lower density than in previous areas. The seabed appeared to be covered by a beard of polychaete tubes. A RoxAnn survey grid to the north of the previous one was performed during the night.

### Thursday 20 June:

The net was shot at 07h.17 at station 103, in the area surveyed by camera the previous evening. Although a *Nephrops* sample was taken the catch was badly fouled by muddy polychaete tubes that prevented the fish catch being measured. The net was cleaned by towing on the surface to station 102. Station 102 was then filmed followed by a trawl tow in the same area. The final station of the cruise was 101/10 which was trawled first in order to take advantage of the turning tide and then filmed as with the other stations. *R.V. Lough Foyle* then steamed for home docking into Belfast at 23h.45.

## RESULTS

During the cruise 11 trawl stations were performed and all objectives were completed. Station positions are shown in Figure 1. Table 1 is the mean size, catch rates and the proportion of female *Nephrops* by station.. *Nephrops* size frequency data were smoothed using a floating mean procedure by applying the expression:

$$\text{Smoothed catch at length } (N_{l \text{ smoothed}}) = (N_{l+1} + N_l + N_{l-1}) / 3$$

*Nephrops* smoothed length frequency distributions for each tow are presented in Figure 2.

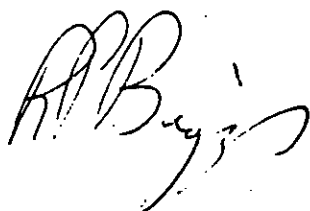
The predominant by-catch species was whiting (*Merlangius merlangus*) and Figure 3 shows the pooled whiting size composition data expressed as catch at length per nautical mile. Haddock (*Melanogrammus aeglefinus*) predominated in the more southern stations (105, 104 and 8) and Figure 4 is a plot of the pooled length frequency data from these stations. Table 2 shows the proportion of *Nephrops*, cod, whiting, hake, haddock and other fish caught at each station.

All *Nephrops* sampled were examined for the prevalence of *Hematodinium*. Visible changes in infected animals included distinctive body coloration, whiteness of claws and characteristic milkiness of the haemocoel. Visual examination indicated a prevalence of less than 1% which is significantly lower than in April (LF1796) when levels of up to 30% were recorded for some stations. Biopsies of heart and tail muscle were preserved in 10% buffered formalin for subsequent histopathological confirmation of infection. Infection levels by station are shown in Table 1.

A Day Grab sample was taken at each station and will be subjected to granulometric and organic carbon analysis. Camera tows were performed at all 11 stations trawled and provided over 12 hours of video film and 130 'stills' photographs of the seabed. Preliminary analysis suggests that the bottom varies significantly between stations. This observation was confirmed by the RoxAnn grid surveys. These data will be examined in more detail and should make a significant contribution to an understanding of the *Nephrops* habitat. In addition to contributing to the DANI time series data-base on *Nephrops*, information from this cruise will contribute to a recently initiated EC funded project on the estimation of *Nephrops* biomass.

#### ACKNOWLEDGEMENTS

The Master, officers and crew of MRV Lough Foyle are thanked for their enthusiastic co-operation throughout this very successful cruise. The scientific staff once again worked as "a well oiled machine" and are to be congratulated for their example of effective team work in completing the cruise objectives.



R.P. Briggs  
(Scientist in Charge)



A. Niblock (Seen in draft form)  
(Master)

21 June 1996

Table 1

Details of *Nephrops* catches and percentage of animals infected by *Hematodinium*

| TOW | STN    | male<br>mean cl | female<br>mean cl | Nos.<br>per nm | kg<br>per nm | %<br>female | <i>Hematodinium</i><br>infection (%) |
|-----|--------|-----------------|-------------------|----------------|--------------|-------------|--------------------------------------|
| 1   | 2      | 30.0            | 26.6              | 18             | 0.4          | 70.0        | 0.00                                 |
| 2   | 109    | 28.5            | 25.3              | 563            | 8.3          | 48.2        | 0.98                                 |
| 3   | 17     | 30.0            | 26.7              | 152            | 2.6          | 70.6        | 0.00                                 |
| 4   | 207    | 30.7            | 28.0              | 639            | 11.3         | 56.4        | 0.63                                 |
| 5   | 8      | 28.5            | 23.9              | 305            | 4.7          | 32.2        | 0.80                                 |
| 6   | 105    | 34.6            | 32.9              | 212            | 6.2          | 41.4        | 0.00                                 |
| 7   | 104    | 27.8            | 24.8              | 1437           | 19.1         | 52.1        | 1.01                                 |
| 8   | 106    | 31.5            | 26.1              | 428            | 8.9          | 28.4        | 0.68                                 |
| 9   | 103    | 32.7            | 26.8              | 88             | 2.4          | 23.9        | 2.39                                 |
| 10  | 102    | 26.2            | 24.2              | 1025           | 14.3         | 59.0        | 0.79                                 |
| 11  | 101/10 | 29.9            | 25.3              | 348            | 6.0          | 38.5        | 0.72                                 |

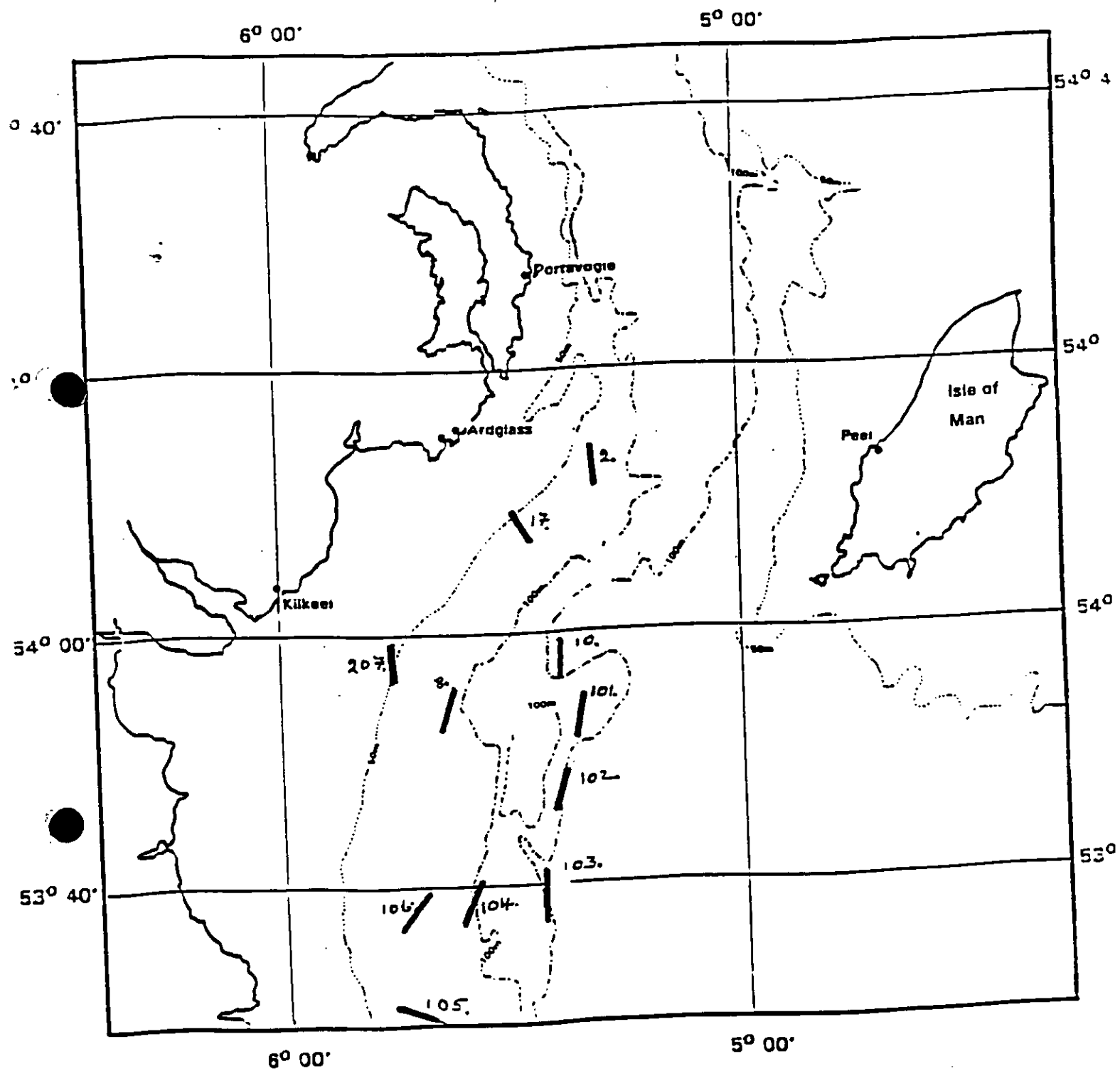
Table 2

Catch (kg) per nautical mile of tow

| TOW | STN    | NEPHROPS | COD   | WHITING | HAKE | HADDOCK | O. FISH | CANCER |
|-----|--------|----------|---|---------|------|---------|---------|--------|
| 1   | 2      | 0.38     | 0.23  | 21.43   | 1.10 | 0.22    | 14.74   | 0.14   |
| 2   | 109    | 8.27     | 0.17  | 14.80   | 2.71 | 0.01    | 14.40   | 0.32   |
| 3   | 17     | 2.57     | 0.00  | 10.37   | 0.36 | 0.17    | 14.39   | 1.88   |
| 4   | 207    | 11.32    | 0.65  | 50.72   | 1.22 | 1.19    | 9.87    | 0.39   |
| 5   | 8      | 4.69     | 3.09  | 75.92   | 0.42 | 9.98    | 15.41   | 0.29   |
| 6   | 105    | 6.15     | 6.04  | 2.46    | 0.00 | 42.96   | 30.05   | 0.00   |
| 7   | 104    | 19.08    | 22.20   | 0.35    | 0.84 | 7.72    | 2.00    | 0.00   |
| 8   | 106    | 8.86     | 4.60  | 44.75   | 0.02 | 0.41    | 10.90   | 0.00   |
| 9   | 103    | 2.42     | <i>Nephrops</i> sample only ** MUD WORM TUBES** |         |      |         |         |        |
| 10  | 102    | 14.30    | 1.22  | 0.75    | 1.89 | 0.30    | 13.21   | 0.00   |
| 11  | 101/10 | 5.96     | 2.74  | 0.49    | 0.00 | 1.06    | 8.95    | 0.00   |

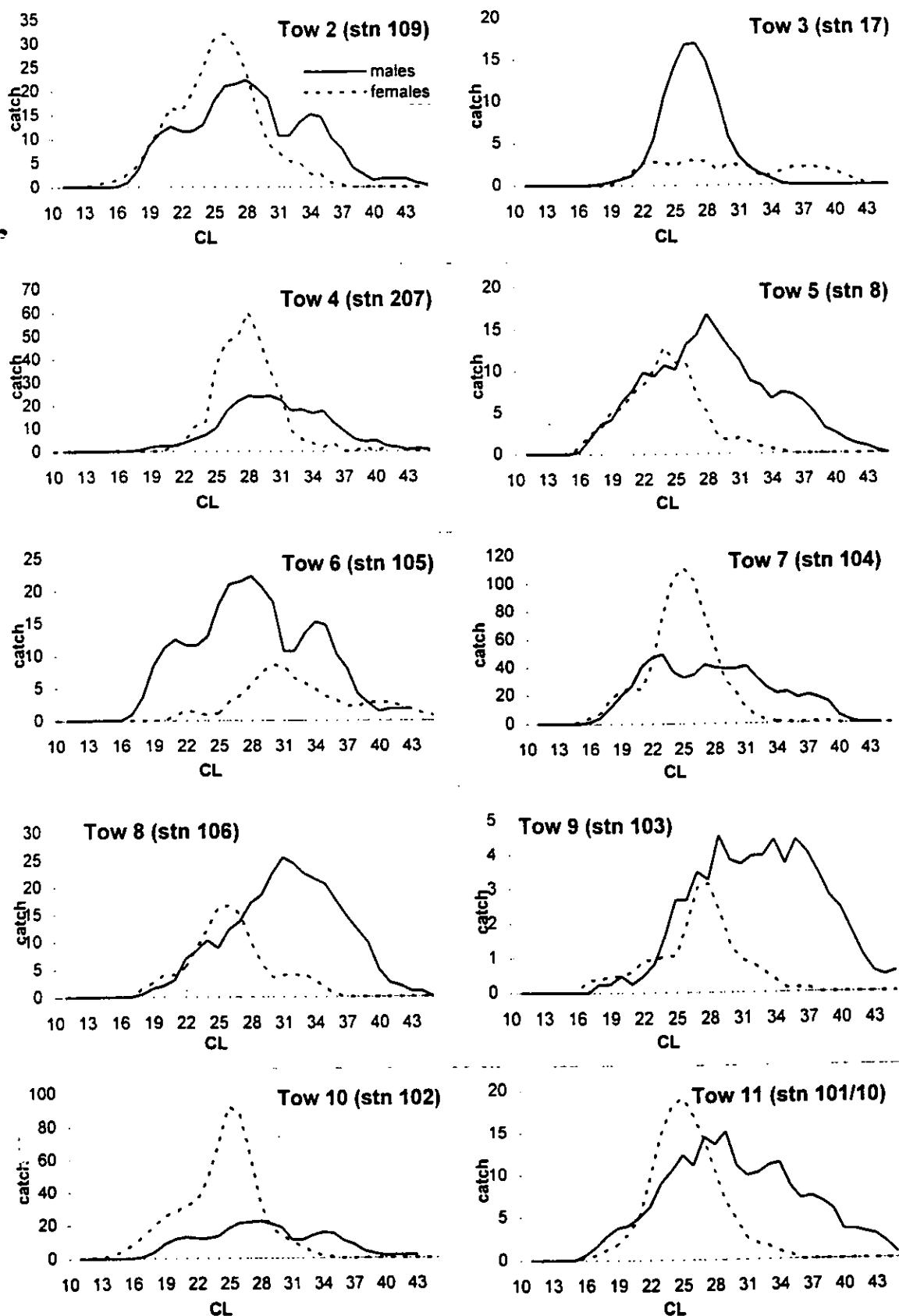
FIGURE 1

Map showing location of stations



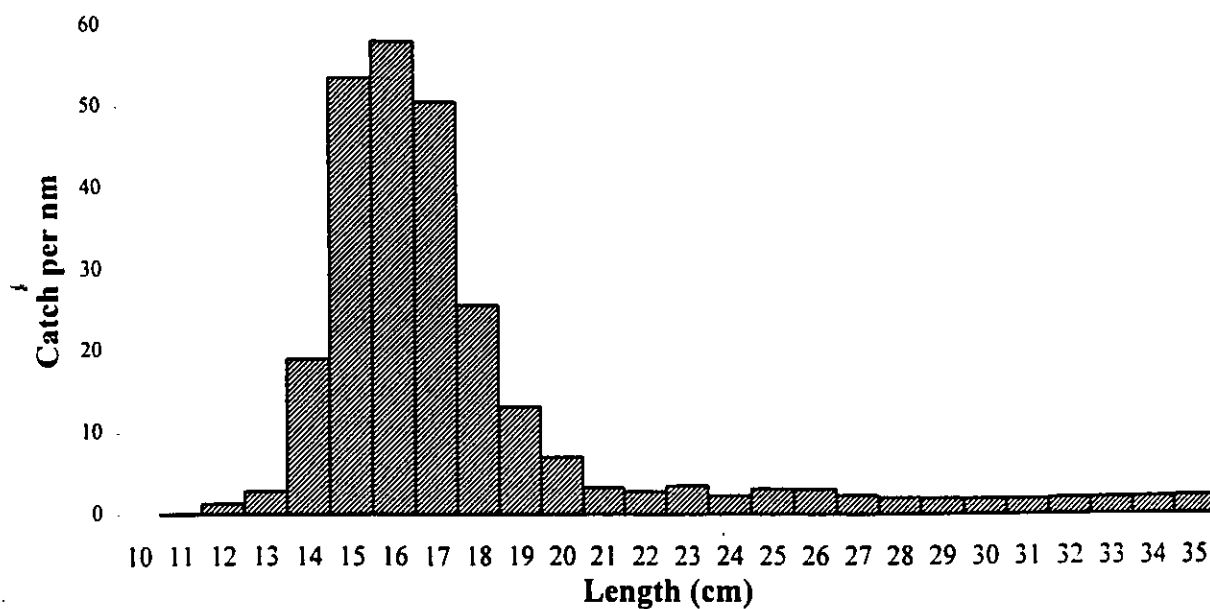
**FIGURE 2**

**SMOOTHED NEPHROPS LENGTH COMPOSITIONS BY STATION**  
(number caught per nautical mile of tow)



**FIGURE 3**

**Pooled Whiting Catch at Length per nautical mile**



**FIGURE 4**

**Pooled Haddock Catch (Total catch from all tows)**

