In Confidence: Not to be quoted without reference to the Laboratory

Cruise Report

FRV GOLDSEEKER

5 - 29 April 1976

Objectives

1. To assess the abundance of Nephrops and their burrows on commercial grounds in the Firth of Forth.

2. To determine variations in trawl catches and in the behaviour of Nephrops by day and night.

3. To measure the efficiency of a Nephrops trawl.

4. To assess the effect of tides on Nephrops catches and behaviour.

5. To set up cages of bivalve molluscs to assess pollution effects in the upper reaches of the Firth.

Narrative

After a delay through bad weather, Goldseeker sailed from Buckie on 7 April and arrived at Granton Harbour on the evening of the 8th. Dr Hislop and Mr Coull joined and objective 5 was completed on 9 April. Photographic and Television work was carried out from 12 - 23 April followed by day and night trawling between 26 - 28 April. It was unfortunate that between 13 - 15 April the Telford time-lapse camera system was lost in 20 fathoms about 2 miles WNW of Bass Rock. This prevented work on objective 4 and reduced the amount of data collected for objective 2. 1½ days of the cruise were spent 'creeping' and trawling for the camera without success. After fishing through the previous night the cruise terminated at Leith at 1500 hrs on 28 April.

Results

1. Television and photographic observations

The TV camera was either mounted on a sledge towed behind the ship or mounted with the stereo camera on a framework suspended below the drifting vessel. The sledge worked very well, the main limitation being poor water clarity in the Firth for most of the cruise. Observations over the dusk period showed that the highest densities of Nephrops out of their burrows were recorded 1-2 hours before sunset, the maximum density being 1 animal per 12 $m^2$. The overall density is likely to have been much higher than this because a high proportion of Nephrops would probably remain concealed within their burrows.

280 stereo photographs were taken of the sea bed at different positions to enable densities and types of burrows to be identified. These are still being processed. One 24 hour time-lapse film was recovered before the camera was lost and this is being processed.

2. Trawling

15 hauls (1 or 2 hour duration) were made with a standard prawn trawl near Bass Rock (20 - 28 fathoms depth). Catches were generally small with a peak of 1000 Nephrops/hour 1 - 2 hours before sunset. No comparable dawn peak was obtained. The catch composition is given in Table I. 39.3% of the catch were females and only 4.4% of females were berried.

Table I Catch Composition from 15 Hauls

| Carapace length in 5 mm groups | | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-45 | 45-49 | 50-54 | 55-59 | Total | Mean CL(mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Males | No | 2 | 43 | 184 | 211 | 126 | 70 | 31 | 1 | 0 | 668 | 32.6 |
| | % | 0.3 | 6.4 | 27.5 | 31.6 | 18.9 | 10.5 | 4.6 | 0.2 | 0 | | |
| Females | No | 8 | 38 | 123 | 106 | 56 | 54 | 38 | 8 | 2 | 433 | 33.1 |
| | % | 1.9 | 8.8 | 28.4 | 24.5 | 12.9 | 12.5 | 8.8 | 1.9 | 0.5 | | |
| Totals | No | 10 | 81 | 307 | 317 | 182 | 124 | 69 | 9 | 2 | 1101 | |
| | % | 0.9 | 7.4 | 27.9 | 28.8 | 16.5 | 11.3 | 6.3 | 0.8 | 0.2 | | |

It was impossible to attempt objective 3. The intention was to tow the TV camera sledge and trawl at the same time but limitations of deck space and gear handling arrangements prevented this. Suitable modifications to overcome this difficulty are urgently needed and it is hoped that they will be carried out later this year.

C J Chapman
16 June 1976

Seen in Draft: A Mair