

IN CONFIDENCE: Not to be quoted without reference to the laboratory

FRV 'Goldseeker'

4GR84

REPORT

19 April - 4 May, 1984

Objectives

- 1) To determine catch rates, size composition and maturity of Nephrops in small and standard mesh trawls in the Firth of Forth.
- 2) To study growth of Nephrops in different parts of the Forth.
- 3) To obtain mud samples on the grounds for particle size, shear-stress, organic carbon and faunal analysis.

Narrative

Scientific staff joined 'Goldseeker' at Leith on 19 April and, after loading the gear, the vessel sailed for Methil ready to begin trawling at dawn on 20 April. 'Goldseeker' worked on the "Buckers" ground in the vicinity of Methil until 22 April during which five cages of Nephrops in pre-moult condition were laid on the sea bed about 1nm south of Kinncraig Point ($56^{\circ} 10.2'N$; $02^{\circ} 51.5'W$). Trawling was then carried out in three other areas, SSE of May Island, off Fidra Island and on the "Braes" ground and a sixth cage of Nephrops was laid with the others on 23 April. On 25 April grab samples were obtained from each trawl station for sediment and faunal analysis before 'Goldseeker' returned to Leith for the half-landing. Mr Chapman left the ship and was replaced by Mr K MacKenzie.

During the second half of the cruise trawling and grab sampling was carried out in four other areas, the "Horn" ground, off Bass Rock, west of May Island and east of the "Buckers". Two trawling stations were lost through adverse weather conditions. The main objectives being completed, 'Goldseeker' docked at Granton on 1 May where Mr Ballantyne left the ship. The vessel left Granton at 0600 hours on 2 May and docked at Aberdeen at 1720 where Mr MacKenzie left the ship. Water samples for radio-caesium analysis were collected off Arbroath during the passage. On the following day 'Goldseeker' proceeded to Buckie. Gear was off-loaded on 4 May.

Results

1) Trawling

All trawling was carried out around dawn and dusk. Whenever possible hauls were made with small (BT126D) and large mesh (BT126) trawls at each station. The length composition of the catches is summarised in Table 1. A more detailed analysis will be carried out once the sediment analyses have been carried out.

2) Growth studies

Six cages containing 104 Nephrops in separate compartments were laid on the sea bed. Most of the Nephrops were identified as being in pre-moult condition from microscopic examination of their pleopods. The cages were left for moulting of the Nephrops to occur and arrangements are being made to recover them at the end of May.

Some information on the proportion of pre-moult Nephrops in the trawl catches was obtained from routine examination of pleopods. The results are summarised in Table 2.

3) Grab sampling

At least two grab samples were obtained in each area of trawling. A sample of mud was taken for particle size and organic carbon analysis, a mud core taken from the grab was preserved for meiofauna and the remainder was sieved through 0.5mm mesh to retain the macrofauna.

Seen in draft: G Calder

C J Chapman
15.05.84

TABLE 1 Size and sex composition of Nephrops in the Firth of Forth
(all hauls combined for each net).

| Carapace Length range (mm) | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55- | Total | Mean CL(mm) |
|---|------------|------------|-------------|-------------|-------------|-------------|------------|------------|-----------|-----------|---------------|-------------|
| Small mesh trawl (5.65 hours trawling) | | | | | | | | | | | | |
| Male | 70 | 467 | 1393 | 1473 | 1166 | 617 | 274 | 148 | 41 | 7 | 5,656 | 27.8 |
| Female | 42 | 501 | 1479 | 1821 | 1387 | 320 | 81 | 56 | 0 | 7 | 5,494 | 26.8 |
| Total | 112 | 958 | 2872 | 3294 | 2553 | 937 | 355 | 204 | 41 | 14 | 11,150 | |
| Large mesh trawl (6.3 hours trawling) | | | | | | | | | | | | |
| Male | | 23 | 262 | 734 | 934 | 606 | 466 | 124 | 46 | 1 | 3,196 | 32.7 |
| Female | | 4 | 200 | 630 | 1100 | 496 | 138 | 18 | 4 | 11 | 2,601 | 31.5 |
| Total | | 27 | 462 | 1364 | 2064 | 1102 | 604 | 142 | 50 | 12 | 5,797 | |

TABLE 2 Numbers and percentage of Nephrops in pre-moult stages in Firth of Forth 20-29 April, 1984

| Carapace length range (mm) | MALE | | | FEMALES | | |
|----------------------------|--------------|-----------------|----------------|--------------|-----------------|----------------|
| | Total sample | No in pre-moult | % in pre-moult | Total sample | No in pre-moult | % in pre-moult |
| < 20 | 45 | 12 | 26.7 | 49 | 15 | 30.6 |
| 21-30 | 506 | 92 | 18.2 | 420 | 55 | 13.1 |
| 31-40 | 439 | 58 | 13.2 | 494 | 9 | 1.8 |
| 41-50 | 109 | 9 | 8.2 | 53 | 1 | 1.9 |
| > 50 | 6 | 1 | 16.7 | 12 | 0 | 0 |