R1/17

4
10MR73

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

CRUISE REPORT

FRS MARA

17 October - 16 November 1973

STAFF:

C J Chapman	17-19/10; 29/10-16/11
A D F Johnstone	17/10-9/11
J Main	29/10-2/11
G I Sangster	29/10-2/11
J H B Robertson	22-26/10
C Shand	12-16/11
R Priestley	7-9/11
J R Dunn (Birmingham University)	5-16/11
P N Denbigh " "	7-9/11

OBJECTIVES:

To measure day and night variations in trawl catches and behaviour of Nephrops, and to make diving observations on the operation of the Nephrops trawl and its effect on the sea bed.

GENERAL:

The first part of the cruise was devoted to day and night trawling for Nephrops in 30-35 fathoms depth in the Moray Firth. The area selected for this work was 5 miles N of Lossiemouth (57°48½'N 03°16½'W). A TV camera was used to locate a shallow Nephrops ground off Nairn where diving observations on the trawl were conducted during the second part of the cruise. The final two weeks of the cruise were devoted to trials with the Birmingham University towed vehicle. The self-contained time-lapse camera was not used because of the presence of commercial vessels in the areas worked.

RESULTS:

1. Trawling The gear used was a Stuart 20 fathom prawn trawl, fished with metal 'V' otterboards, 30m sweeps and 15m spreading wires. The grassrope was made from sisal weighted with 120g leads. Two Japanese tension recorders were coupled to each end of the footrope. Towing speed was approximately 2½ knots. A total of 21 one hour hauls were made off Lossiemouth at different times of the day and night. Light intensity measurements at 10m intervals were made at the beginning and end of each tow. The largest catches were made at dawn and dusk. Small catches, about one third of those at dusk/dawn, were obtained during darkness but virtually no Nephrops were caught during daylight.

The tension recorders at the wing ends registered 0.14 - 0.2 tons on different tows with one of the units consistently reading 0.03 tons below the other.

From these readings and other evidence it can be concluded that the gear was symmetrical and was in good contact with the bottom for all hauls.

2. Diving Observations Observations were made on the trawl towed over a sandy bottom in Spey Bay (57°44'N 03°13½'W depth 22m) and over a shallow Nephrops ground off Nairn (57°37½'N 03°53½'W depth 21-27m). The divers observations were recorded on cassette tape recorders carried in underwater housings fixed to the aqualung harness.

The general conclusion was that the gear appeared to be fishing satisfactorily apart from a tendency for the two spreading wires to become twisted. This probably accounted for the rather low headline height of 1m at the centre of the square. The lead weighted groundline was making good contact with the bottom but there was a gap between it and the footrope of the net. Several flatfish were seen to escape through this gap and it seems likely that Nephrops would also escape in the same manner.

Observations from the headline of the net during hauls off Nairn showed that there was a high density of burrows in the area, both of Nephrops and Calocaris. Although the claws of Nephrops were seen in the openings of some burrows no animals were seen away from their burrows during the daylight dives and not surprisingly the catches were very small. Two hauls on this ground just after sunset and sunrise (not observed by divers) gave good catches.

A very noticeable feature of the dives was the presence of many grooves and tracks across the sea bed, presumably produced by commercial gears. On two occasions a 100m nylon line was paid out behind the net to mark the track of the trawl. The track was then examined by divers. The otterboard excavated a shallow trough about 30 cm wide by 10 cm deep and deposited small discrete piles of mud every metre inside the track of the board. Several Nephrops burrows lying in the path of the board were partially filled in. Small shallow grooves were made by each of the leads on the groundline. The groundline did not appear to cause very much damage to the burrows.

3. Birmingham towed vehicle The vehicle was fitted with a Hydro-Products TV camera and lighting system. The video signal was obtained through signal leads within the towing cable. The vehicle was tested in Spey Bay over sandy and stony ground. Valuable experience was obtained in handling and manoeuvring the body close to the sea bed. Unfortunately 6 days of the programme were lost through bad weather and no surveys of Nephrops grounds were conducted.

C J Chapman
18 December 1973