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FRV EXPLORER 6ER80

CRUISE 6/80 HJT

REPORT
14 May - 3 June 1980

OBJECTIVES:

1 To obtain engineering performance data (particularly net drags) on 3 trawls of similar design but differing in mesh size and twine diameter.

2 To measure the hydrodynamic coefficients of trawl warp.

3 To investigate the handling of the Remote controlled bathyscope on EXPLORER, with a view to using the equipment for the measurement of fish catching efficiency.

NARRATIVE:

Scientific staff joined the ship in Leith at 1430 hrs on 13 May. Owing to industrial action the next day, sailing was delayed until 0900 hrs on 15 May. That evening speed log calibration runs were made over the measured mile in Aberdeen Bay. 'Explorer' berthed at Point Law at 2200 hrs, to bunker and to await the arrival of a relief fishing mate.

Having departed Aberdeen at 1100 hrs on 16 May, trawling commenced off Balta on 17 May. The instrumented gear work continued there until 22 May, except for 19 May when the streamed warp measurements were done in deep water North of Shetland. 'Explorer' arrived in Kirkwall at 0900 on 23 May for the half landing.

Television equipment transported by lorry from Aberdeen was loaded that afternoon. The next day was spent in port while cables were prepared for the TV vehicle (RCB). 'Explorer' left Kirkwall at 1000 hrs on 25 May, and work with the TV vehicle began that evening in the Moray Firth (Bellans ground). The period 28-29 May was spent trawling on Smith Bank, and 30 May - 2 June on deeper tows off Copinsay. 'Explorer' then made for Aberdeen, berthing there at 0730 hrs on 3 June.

RESULTS:

(a) Gear performance measurements

The following table shows the main features of the three nets tested at a towing speed of 3.5 knots. In each case the gear was fished with 30fm twin sweeps, 9 ft rectangular flat doors and 250fm warp amidships. The water depth on the tow 5 miles off Balta Island was in the range 60-70fm. Four instrumented hauls were made with each of the nets BT 130B and BT 130C, but there was time for only one haul with BT 130D.

Net	BT 130B	BT 130C	BT 130D
Headline height (ft)	15	14.5	12.5
Wingend spread (ft)	68	67	70
Door spread (ft)	161	170	180
Bridle angle (deg)	15	17	18
Net drag (tons)	3.7	3.0	2.4

These results are crude estimates from a preliminary examination of the instrument traces. More precise results will be produced later, in particular once tide corrections have been made. The net drags appear higher than expected, having regard to the amount of twine in the nets, and this aspect requires further investigation.

(b) Warp measurements

A 300fm length of 26mm diameter trawl warp with weights attached to the outboard end was towed at various speeds. On the first run the attached weight was 800lbs (in water), and twice that on the second run. The tension in the warp and the vertical angle at the shipboard end were measured. A recording depth meter was attached to the lower end, but it did not work reliably, probably on account of vibration. Nevertheless, the data recorded from surface instruments are sufficient to compute the hydrodynamic forces on the warp.

(c) Television observations

The Mk 1 and Mk 2 remote controlled television vehicles (RCB's) were used to observe the fishing performance of BT 130C. A handling system was derived shooting the vehicle from the port side which proved to be most successful. Fish reactions to the sweeps and groundgear were studied at depths down to 44fm, the limit for the available length of RCB cable.

Very few fish were seen on Smith Bank and the Bellans ground (Moray Firth). Much better though still moderate catches were obtained off Copinsay. Haddock predominated in the catch, and the rate of catch for this species was around 2 baskets/hour. Also present in significant numbers were whiting, plaice and dab, although the haddock catch was several times that of all other species combined.

The majority of fish seen reacting to the gear were flatfish. That a smaller number of roundfish reactions were observed is probably explained by the difficulty in detecting the well camouflaged haddock against a moving background on a TV screen. Flatfish, on the other hand, are easily detected once they move. Nevertheless, some roundfish were seen and the ability to observe the these commercially important species around the trawl is an important advance in direct observation technique. The flatfish herded by the sweeps always remained close the sea bed, but the roundfish were seen not to be so constrained. Some roundfish did swim in front of the sweeps, herded along the sea bed, but others rose and changed direction in a more dramatic escape reaction.

Most of the flatfish seen were successfully herded by the sweep, but in approximately 10% of the observations, the sweep having raised the fish then passed underneath it so that the fish escaped.

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Seen in draft:
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