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FRV *Clupea* 12CR90

Cruise 12/90

REPORT

22 October - 9 November 1990

Personnel

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| R S T Ferro | PSO |
| G I Sangster | HSO |
| C W Shand | HSO |
| P J Barkel | PTO |
| N S Collie | PTO |

Objectives

1. To study the relation between net design, codend geometry and water flow through the codend using underwater television and a new acoustic instrument for measuring codend width during fishing.

2. To measure the selectivity of a codend with different mouth geometries.

3. To obtain film of Norway pout during the capture process to provide design criteria for a Norway pout separator trawl.

Narrative

*Clupea* sailed from Buckie at 1350 on 22 October, immediately after the fishing gear and scientific equipment had been loaded. Grounds to the west and northwest of Orkney were worked while strong southeasterly winds prevailed. On 24 October Mr Shand left the ship and Mr Barkel joined at Stromness. On 29 October passage was made to Kirkwall in poor weather. The half-landing was taken on 30 October.

Work continued on the Copinsay grounds to the east of Orkney for the next eight days although two days were lost due to northerly gales. On 8 November work continued on fishing grounds off Wick where two hauls were made before *Clupea* sailed for Buckie, arriving at 1900. Scientific equipment was unloaded the following morning.

Results

Flow measurements were made in the mouths of codends of several different designs. Rigid rings of 0.5, 0.75 and 1 m diameter were attached around the outside of the codend mouths to assess the effect of mouth diameter on flow. With the 0.5 m ring, the diameter of the codend netting was 0.4 m which was close to its value without a ring. With larger rings the meshes at the aft end of the extension and the forward end of the codend were clearly more open. At the mouths of 90 mm diamond mesh codends, the flow was found to be from 40-60% of the net speed through the water, for all ring sizes.

The selectivity of a standard 90 mm diamond mesh codend on one side of the twin trawl was measured with both 0.5 and 1 m rings. A 30 mm small mesh codend was fished on the other side to obtain a representative sample of the fish population. After 17 hauls there was no clear selectivity difference between the two ring sizes and the ring experiment was discontinued. These preliminary results suggest that there is not a major change in selectivity when the codend mouth diameter is doubled.

The catch in a standard codend was compared with that in a roped codend. Ropes which were 15% shorter than the stretched length of the netting were attached to the two codend selvedges. The codend meshes remained slack and open. No roundfish were caught in the roped codend while three quarters of a basket of whiting was caught in the standard codend.

A modified design of a square mesh window was tested. The 4 m, 90 mm, panel was made up with a 2T1B cut along the forward and aft edges. The longitudinal bars remained parallel to the selvedges but the transverse bars ran diagonally across the codend, creating diamond shaped meshes which were open less than square mesh netting but more than in normal diamond mesh netting. The cutting rates along the fore and aft edges determine the openness of the meshes and hence the selectivity of the window. Observation showed that the meshes in the window maintained a regular diamond shape with even strain over the panel. However, the tension in the diagonal transverse bars caused the whole codend to rotate about its longitudinal axis so that it was twisted through an angle of about 30° from fore to aft ends. During two hauls catches of whiting and flatfish in this codend and one with an 80 mm square mesh window were found to be similar.

No useful data were obtained from the acoustic instrument for measuring codend diameter because of technical problems.

Because of the loss of three days work due to poor weather, no film of Norway pout behaviour was obtained.

R S T Ferro
27 February 1991

Seen in draft: W Smith