

R1/6

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FRV *Clupea*

Cruise 5/91

REPORT

5CR91

25 March - 3 April 1991

Personnel

J Main	SSO (in charge)
D Galbraith	HSO
G Sangster	HSO
P Barkel	PTO
D Wileman	DIFTA Hirtshals

Objectives

1. To develop a species selective trawl for industrial fishing where industrial species will be held in one cod-end and protected species diverted into a second cod-end.
2. To study the geometry of the net in shallow water using diving techniques.
3. To study fish reactions to the separating panel fitted in the commercial pout trawl using the RCTV in deep water.

Narrative

Scientific staff joined *Clupea* at Ardrossan on the afternoon of 25 March and prepared for sea. The vessel sailed at 1500 and made a passage for Stornoway. Whilst passing the Shiants on 26 March, the RCTV was deployed in deep water to ascertain the maximum working depth on the 480 m cable, towing at various trawling speeds. (The new 800 m cable ordered for the cruise did not arrive on time due to manufacturing problems). A spare RCTV towing cable was off loaded and stored at Stornoway harbour. *Clupea* worked daily from Stornoway during the next three days, either in Broad Bay with the diving team, or off Tiumpan Head using the RCTV. On completion of the first set of tests in Broad Bay on 28 March, the vessel sailed to Kyle to change trawls. This task was completed that evening and *Clupea* was on station again the next day in Broad Bay at 0830. During the next three days most of the tests were completed. On 1 April the vessel again sailed for the fishing grounds but had to return due to gale force winds. The opportunity was taken to change the trawls again and to collect the empty RCTV cable drum from the pier. Arrangements were made to return the spare television cable by steamer via Ullapool due to the bad weather forecast for the passage to Kyle. With the continuing bad weather on 2 April, it was decided to move south towards Kyle which allowed us to make two hauls 8-10 miles north of Skye in sheltered waters. The *Clupea*

tied up at Kyle at 1700 on 2 April and prepared the trawls and scientific gear for off loading and returning to Aberdeen. The staff returned to Aberdeen by minibus on 3 April.

Results

All three objectives were achieved during the cruise. The full sized trawls behaved as designed and tested in the flume tank in Hirtshals. Headline height and wing-end spread measurements recorded on the full sized trawls were also as predicted by the model testing. The leading edge of the separator panel in both nets was found to be positioned too far behind the footrope but with modifications to the rigging of the ground gear these problems were overcome. In total 18 hauls were made of which eight were on recognised fishing grounds. Only small quantities of the required species were encountered of which pout, whiting, haddock and herring were in the size range of 10-27 cms. The ideal strop settings and position of the panel (relative to the footrope) for good separation could not be determined in the short time available on the fishing grounds. Nevertheless, informative video recordings of the net's performance were obtained in shallow water by both diving and remote vehicle. In deep water (100 m plus) on the fishing grounds the visibility range was extremely poor and on occasions was as low as one metre but again video recordings were obtained of fish in the area of the footrope and separating panel but at very close range. On most occasions it was difficult to dive the vehicle to the required depth due to the short length of RCTV cable and on a few occasions the towing speed had to be reduced to around two knots to find the net itself. Under these conditions the best separation was between pout and herring; 83% of pout was in the bottom cod-end and 61% of herring into the top cod-end. With the poor visibility it was difficult to make direct observations of fish in relation to the separator panel. On other occasions, the footrope was seen digging into the mud and a big mud cloud obscured the leading edge of the separating panel. This would certainly have affected the behaviour of the rising fish. Weights were removed from the footrope to improve this situation but worries increased regarding bottom contact. Diversion of most fish into the top or bottom compartments could be achieved by only slight adjustments to the 1 and 2 m strops but separation of the species was difficult. A typical example of these diversions for both short and long strop is shown below.

Pulling the leading edge of the separating panel down by shortening the strops diverted the fish up and into the top cod-end and by lengthening the strops the fish were allowed to pass into the lower cod-end.

	Short strops	
	Top cod-end %	Bottom cod-end %
Herring	96	4
Pout	91	9
Whiting	88	12
Haddock	87	13
Flatfish	0	100
<i>Nephrops</i>	0	100

	Long strops	
	Top cod-end %	Bottom cod-end %
Herring	94	6
Pout	33	67
Whiting	17	83
Haddock	28	72
Flatfish	0	100
<i>Nephrops</i>	0	100

The video tapes, fish measurements and separation of the species data are now being analysed at the Laboratory. It has been shown from the direct observations that this design of commercial pout trawl will require some modification to the bosom of the footrope. It requires to be lengthened by approximately 3 to 5 metres to enable fish to accumulate in front of the footrope before falling back to pass either over or under the separating panel. It might also be that a towing speed of three knots or greater is too high to allow small fish to rise fast enough to enter the top compartment. These points will have to be considered carefully before the August cruise (Phase III).

John Main
22 May 1991

Seen by: G Jack, OIC of *Clupea*