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Commercial Vessel *Solstice*

Charter Cruise 9207H

REPORT

13 April - 1 May 1992

Personnel

J Main	SSO (in charge)
G Sangster	HSO
J T M Hunter	PTO part time
R Kynoch	SO part time
C Shand	HSO part time
F O'Neill	SO part time

Objectives

1. To compare the selection characteristics of round fish in a 100 mm mesh cod-end, 100 open meshes in circumference, using hooped and non-hooped 35 mm covers to retain the escaping fish. Both covers fitted over the cod-ends of two identical trawls, fished in a two-warp, twin rig system. The hoops on the cover to be exchanged between trawls every haul.
2. To compare the same twin trawls having an uncovered 100 mm test cod-end on one side and the same cod-end with the hooped cover on the other side to check whether the cover affects the quantities of fish retained by the cod-end.
3. Prior to the fishing trials, diving observations to be made to check that the modification to the previous design of hooped cover is satisfactory. Divers to examine the positioning and correct working of three small flow metres located a) in the cod-end; b) between the cod-end and cover; and c) on the outside of the cover.

Narrative

The diving gear, towed underwater vehicle and the twin trawls were transported to Macduff on 13 April where the *Solstice* was loaded and prepared for work.

The vessel sailed at 2330 and was on station for diving operations off Nairn the next morning at 0800. The divers found that the water clarity was less than one metre near the sea bed. Diving was abandoned and with a forecast of gale force winds a move was made to the Dornoch Firth where again the water clarity was found to be too bad for divers to make observations on the trawl gear in safety. One haul was made using the Scanmar equipment to check the geometry of the gear, which was found to be satisfactory before the *Solstice* sailed to Invergordon for the night.

On 14 April a tow was made off Nairn in deep water but fishing was poor. Two further hauls were made off Macduff but work had to stop due to the strong wind and sea state. The cover on one of the trawls was badly damaged whilst hauling onboard due to the weather conditions and most of the contents were lost. The vessel entered Macduff at 2100 where repairs were made to the trawl covers etc. The diving gear and underwater vehicle were off-loaded and returned to Aberdeen on 15 April.

The vessel worked off Fraserburgh during 16 and 17 April until one of the trawls was very badly damaged with the loss of a large section of the net including both the cod-end and cover. This necessitated a major repair in Fraserburgh. The trawls were quickly repaired by the manufacturer

"Scotnet" of Fraserburgh, the crew and the scientific staff who made up the cod-end and cover. Work was completed late that same night. Fishing time was not lost because of a severe gale at that time.

Trawling commenced to the west of Fraserburgh in deep water on 19 April where poor fishing was encountered but this improved as the vessel worked westward into the Moray Firth. A number of tows in this area were tried before a passage was made to Fraserburgh for a change of staff on 21 April. Late the same night the *Solstice* sailed to a position 100 miles east of Fair Isle where reasonable catches of whiting were obtained. The weather deteriorated on 24 April and the vessel made for sheltered waters on the south side of the Moray Firth with the vessel arriving late that night. *Solstice* entered Macduff where repairs were made to the cod-end covers including replacement of some zips.

Work recommenced on 25 April off Macduff where the remainder of trip produced good catches of haddock.

Eighteen of the 35 hauls were used for the selection analysis.

The gear was off-loaded on 28 April and returned to Aberdeen.

Results

No diving observations or video material were obtained from this cruise.

Self-recording flow meters were positioned approximately 2 m back from the mouth of the cod-end between the cod-end and the cover and gave readouts every 30 seconds. Only two sets of flowmeter readings were obtained due to the bad weather but these indicated that on haul 21 the flow between the cover and cod-end (hoops on) dropped from 1.7 knots at 0416 to 0.46 knots at 0742 and for the cover (no hoops) from 0.46 knots to 0.02 knots during the same time period. For the cod-end fitted with hoops on the cover on haul 25 the flow dropped from 0.96 knots at 1024 to 0.28 knots at 1516. This drop in water flow is presumably due to an increase in the quantity of fish in the cod-ends and covers as the meshes become covered and blocked.

Catch for	Haul 21	PORT TRAWL		STARBOARD TRAWL	
		Cover	15 baskets	Cover	19 baskets
	Cod-end	12 baskets	Cod-end	9.5 baskets	
	Total	27 baskets	Total	28.5 baskets	
Catch for	Haul 25	PORT TRAWL			
		Cover	18 baskets		
		Cod-end	8 baskets		
	Total	26 baskets			

The mesh sizes of the two cod-ends was found to be 92.2 mm using an ICES 4 kg gauge. Using the combined haddock data for all valid hauls the cod-ends with hooped cover had a 50% retention length (L50) of 27.5 cm and a selection range (SR) of 7.3 cm. With the standard cover without hoops the L50 was 22.6 cm and SR was 14.3 cm. There is a clear difference between the results with and without the hoops on the covers showing that masking can be significant. The whiting data were less reliable.

More detailed analysis will be completed in the Laboratory.

J Main
22 July 1992