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MV *Heather Sprig* (BCK 181)

Charter Cruise 0300H

REPORT

24 July - 2 August 2000

Ports

Loading: Peterhead

Unloading: Peterhead

Personnel

N Graham (In charge)

P Barkel

G I Sangster

R Kynoch

Fishing Gear

Vessels twin trawl prawn rig (70 mm) fitted with selection grids (35 mm bar spacing) and two tier cod-ends.

Scanmar instrumentation.

Objectives

1. To determine species and size selectivity of a rigid selection grid in the *Nephrops* fishery.
2. To assess the practical suitability of selection grids for use in the *Nephrops* fishery.

Out-turn costs per project: C627-10 days

Narrative

Staff joined the vessel in Peterhead on 24 July 2001 at 0900 hours. On one side of the twin rig gear, a grid was fitted into a small mesh two tier cod-end arrangement (40 mm lower and upper), the other being fitted with large mesh cod-ends (70 mm lower and 100 mm upper) and another identical grid prior to commencing the trip. Sailing was delayed due to the provision of incorrect wing-end sensors, which had identical boat codes and were therefore unsuitable for the twin trawl arrangement. Replacements were sent from Aberdeen. The vessel sailed for the Fladen grounds at 1330 hours. Several hauls were conducted in the Fladens area until on 26 July the double small mesh cod-ends were lost, presumably due to an excessive catch of pout. Insufficient small mesh netting was available for repairs, so the vessel steamed for Fraserburgh, where new cod-ends were made by Scotnet with the assistance of T Morrice from FRS Net rigging Department. The vessel crew and SIC fitted extra strengthening bags to the cod-ends to minimise any further catch/strength problems and re-fitted the selection grid. The vessel then sailed for fishing grounds in the inner Moray Firth at 0200 hours. Several hauls were conducted in the Moray Firth but it became apparent that the grid angles were too shallow,

showing similar problems to these encountered during previous trials. The vessel sailed for Macduff harbour to allow the grids to be altered on the pier, work finished at 2300 hours and the vessel sailed again at 0030 hours on 28 July. Although the grid angles were deemed to be appropriate from previous work (~40-45 degrees), the separation achieved was considerably less than observed during previous trials. The vessel steamed to Buckie on the evening of 29 July for a previously arranged crew change, where the SIC took the opportunity to modify the fishing gear further and finished at 2330 hours. The vessel sailed for the inner Moray Firth at 0230 hours and fishing commenced at 0500 hours. The remainder of the charter was conducted on these grounds until the vessel steamed for Peterhead on 1 August at 1830 hours. Scientific personnel disembarked at 1000 hours on 2 August and returned to Aberdeen.

Results

Only 11 valid hauls were performed in the eight days of fishing, which was not unexpected due to the complexity of the fishing gear. During previous trials, problems associated with build-up of debris and mud blocking the grid were highlighted, and similar problems were encountered during these trials. However, during this cruise this problem was exacerbated due to the fact that for the purposes of determining grid selectivity both grids needed to be operating correctly which resulted in a higher possibility of void hauls. With respect to the separation of fish and *Nephrops*, lower levels of separation were achieved in comparison to the development work conducted on the research vessel reported previously. The degree of separation also appeared to be highly sensitive to the grid angle of attack. It is possible that this is due to the design of the trawl used for the experiment, as work conducted previously and by other partners in the project has not highlighted this problem. The principal difference in design relates to the extension length used between the main body of the trawl and the cod-end. Scottish style *Nephrops* trawls have very long extensions and it is possible that with the grids fitted at the face of the cod-end become less stable in terms of grid angle, where the grid angle dropped by as much as 12 degrees between the start and end of the haul. Comparing this to experiments where the grids were attached in short extensions, close to the tapered section of the main body of the trawl, the grid angles were more stable and varied within only a few degrees. The percentage splits between upper and lower cod-end for both the small and large mesh cod-end arrangements for haddock and *Nephrops* were as follows:

Haddock				<i>Nephrops</i>			
Small Mesh		Large Mesh		Small Mesh		Large Mesh	
% Upper	% Lower	% Upper	% Lower	% Upper	% Lower	% Upper	% Lower
45.45	54.55	85.71	14.29	0.00	100.00	0.00	100.00
91.84	8.16	80.00	20.00	56.00	44.00	33.33	66.67
90.00	10.00	90.91	9.09	33.33	66.67	33.33	66.67
91.67	8.33	85.71	14.29	53.33	46.67	27.27	72.73
88.89	11.11	83.33	16.67	22.22	77.78	9.09	90.91
88.89	11.11	86.96	13.04	37.50	62.50	20.00	80.00
91.67	8.33	86.21	13.79	33.33	66.67	20.00	80.00
95.74	4.26	50.00	50.00	20.00	80.00	11.76	88.24
76.92	23.08	50.00	50.00	23.08	76.92	14.29	85.71
84.21	15.79	50.00	50.00	33.33	66.67	11.76	88.24
81.48	18.52	56.52	43.48	42.86	57.14	9.09	90.91

Further statistical analysis is being conducted to ascertain the selectivity parameters of the large mesh cod-ends and grid system. This has required the development of novel statistical techniques by Dr R Fryer and will be reported elsewhere.

In relation to handling of the rigid grids, on occasion some problems were encountered particularly when large quantities of mud and debris were held at the face of the grid. This made it troublesome to remove the objects. More seriously during moderate to rough weather, when the cod-end were being passed to the forward bag hatch, using the power block, the grids swung dangerously in the air resulting in the possibility of a crewman being struck. It is apparent that if separation grids are to be used as a possible conservation method further work is required to overcome the problems of debris, the effect of the trawl design on grid efficiency and better on-board handling techniques.

N Graham
12 January 2001