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Charter Vessel MV *Serene*

Charter Cruise 1801H

REPORT

13-27 August 2001

Personnel

G I Sangster (in charge)
I Penny
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M J Burns

Objectives

To measure the effect of cod-end mesh size on the selectivity of cod-ends in *Nephrops* trawls used by vessels in the medium horsepower range on Scottish west coast grounds.

Narrative

Staff joined MFV *Serene* at Mallaig on 13 August 2001. The gear and instrumentation was immediately prepared and the vessel sailed at 2300 hours for the Barra Peaks *Nephrops* grounds in the South Minch. Cod-end selectivity trials were conducted using the twin trawl method, in which two identical *Nephrops* trawls are towed by one vessel. One net sampled the population of *Nephrops* and fish that were available on the grounds using a small mesh cod-end (40 mm), for which a scientific derogation had been obtained. The other net had one of the test cod-ends and extensions attached. Three cod-end mesh sizes were investigated: 70 mm, 80 mm and 100 mm. The 70 mm and the 80 mm cod-ends were constructed of 4 mm single twine whereas the 100 mm cod-end was constructed of 5 mm double twine. The 70 mm and 80 mm cod-end's were 120 open meshes round and the 100 mm was 100 open meshes round. Square mesh (diamond turned onto the square) panel position complied with the current legislation ie 15 m-18 m from the cod-line. Regulation sized lifting bags were fitted to each of the cod-ends to minimise bias between the fishing performance of the two nets, the trials were carried out as far as possible using straight tows.

The trials continued uninterrupted at the Barra Peaks grounds until the evening of Sunday 19 August, when *Serene* sailed for Mallaig to land the catch that evening. Tuesday 21 August was lost due to bad weather. The vessel continued with cod-end selectivity trials, sailing first to the Raasay Sound grounds for the duration of Wednesday 22 and Thursday 23 August and then on to grounds at Coigach Hole on Friday 24 August. *Serene* continued steadily north, fishing at Scourie Hole and at Tiumpan Head on Saturday 25 August until steaming overnight to fish at South Canna on Sunday 26 August. The vessel then proceeded to Mallaig and docked on the morning of Monday 27 August. Scientific equipment and fishing gear were unloaded and the staff returned to Aberdeen later that day.

Results

Gear measurements

Three cod-end mesh sizes were tested: 70 mm, 80 mm and 100 mm.

	Nominal cod-end mesh size mm	Actual cod-end mesh size mm	Actual extension mesh size mm	Cod-end twine thickness /type mm	Meshes round circum-ference	Panel mesh size mm	Panel twine thicknes s /type mm	Panel distance from codline m
1	70	71.2	70.3	4 mm single	120	90	4 mm single	15-18
2	80	83.1	82.0	4 mm single	120	90	4 mm single	15-18
3	100	103.3	104.1	5 mm double	100	90	5 mm double	15-18

A total of 30, four hour hauls were conducted during the trials, of which 26 were considered valid for analysis. The length range of prawns in the population was from 12.5 mm to 66.5 mm carapace length. Preliminary results show that the 70 mm cod-end did not release any prawns above about 20 mm carapace length (Fig. 1). The percentages retained at each length (dots on graph) are all at ~100% retained.

For the 80 mm cod-end the percentages retained are constant, at about 70 to 80%, at the length range from 20 to 40 mm (Fig. 2). Like the ~~70~~ mm cod-end, this suggests that no selection is taking place. Because the constant level is at about 70 to 80% retained; it is probable that the two nets were not fishing with equal efficiency. The 80 mm net was catching fewer prawns but nevertheless was not allowing even the smaller ones to escape.

The 100 mm cod-end (even with 5 mm double twine) did release prawns up to about 30 mm carapace length (Fig. 3). A typical s-shaped curve is shown.

G I Sangster
15 October 2001

Effects on catches and discards

Minimum landing size (mls) is 25 mm carapace length.

Cod-end		**70 mm**	**80 mm**	**100 mm**
Lifting Bag		Yes	Yes	Yes
No of valid hauls		5	11	9
50% retention length		-	-	26.69
Selection range		-	-	3.63
Nos retained by test codend	less than mls	832	1129	399
Nos in small mesh (~population)	less than mls	912	1446	1908
Nos retained by test codend	mls or greater	9756	17568	16503
Nos in small mesh (~population)	mls or greater	10122	23891	22077
% discards (by nos)		8	6	2
% retained (by nos)	less than mls	91	78	21
% retained (by nos)	mls or greater	96	74	75

Length-frequencies

Minimum landing size indicated by an arrow on each graph.

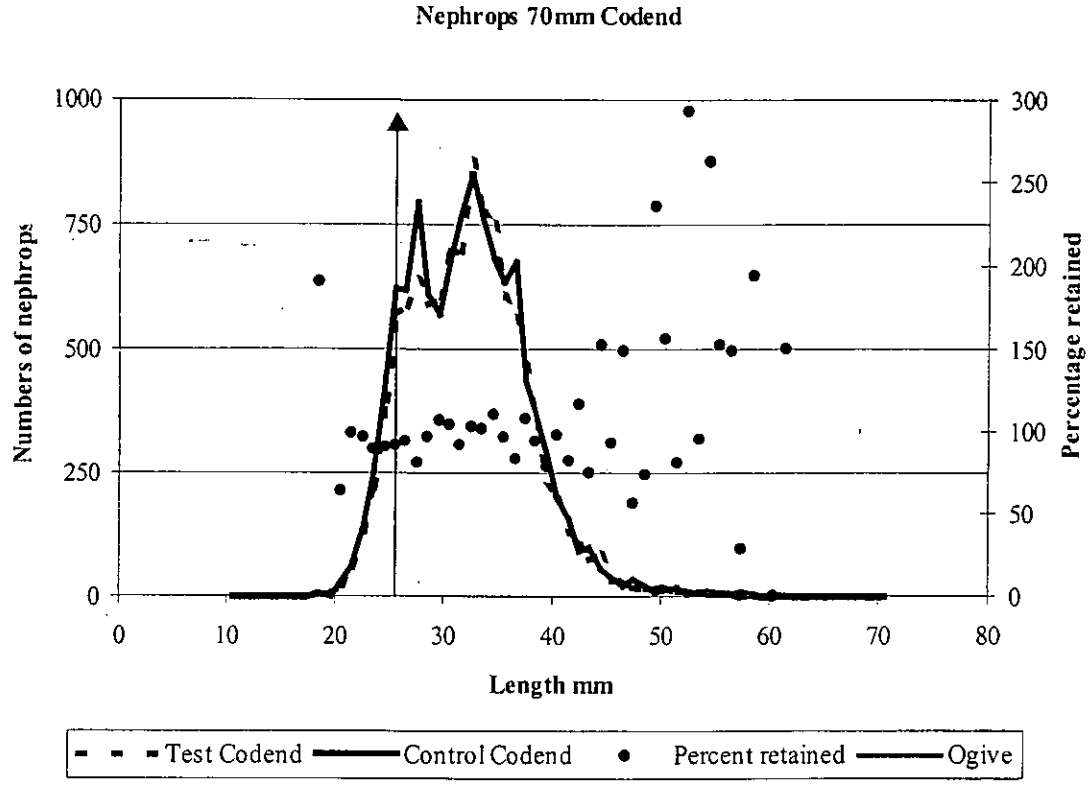

Figure 1: The length-frequency distribution of *Nephrops* in the 70mm test cod-end and corresponding 40mm control cod-end.

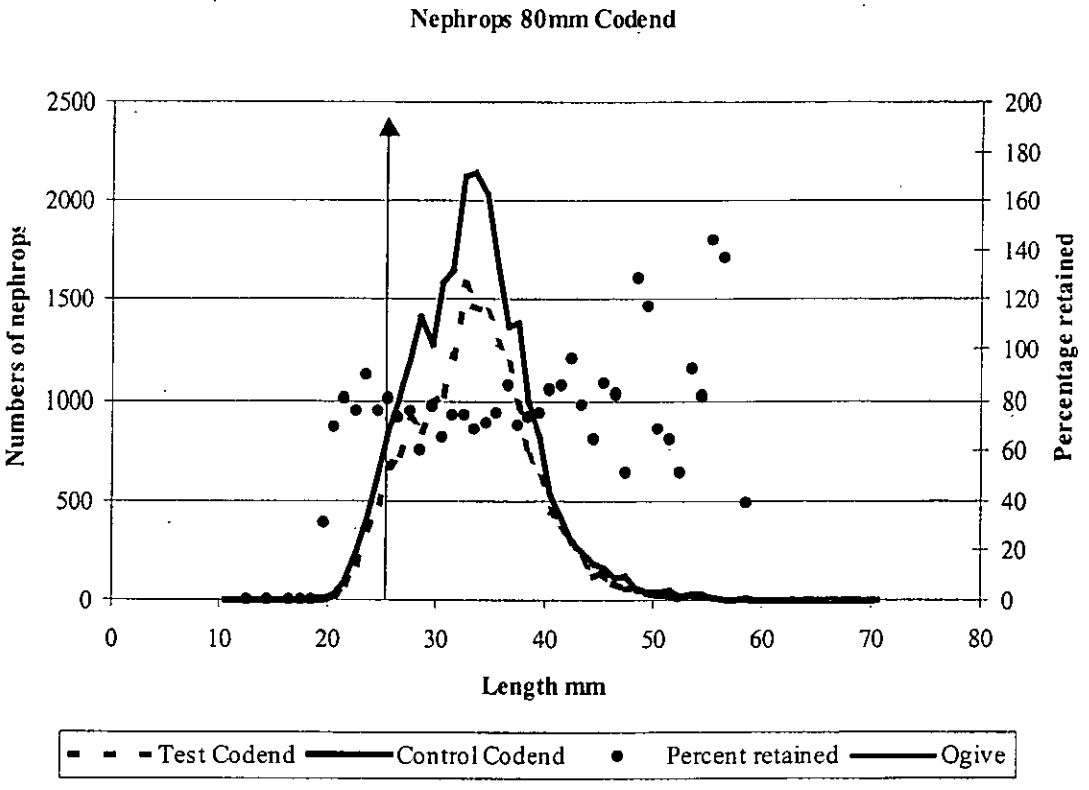

Figure 2: The length-frequency distribution of *Nephrops* in the 80mm test cod-end and corresponding 40mm control cod-end.

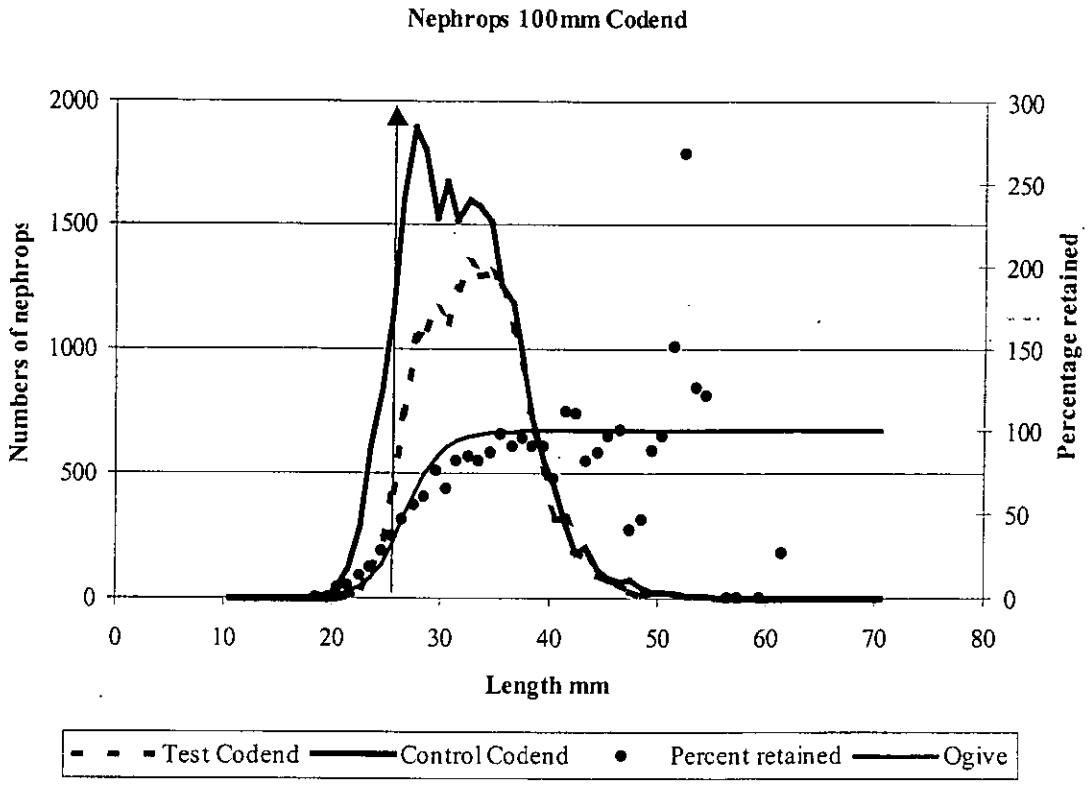

Figure 3: The length-frequency distribution of *Nephrops* in the 100mm test cod-end and corresponding 40mm control cod-end.