

More prawns and fewer cod caught in trials with multi-rig prawn trawl (2009)

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Executive Summary

Multi-rig trawls are used by some fishermen in the North Sea to target prawns (*Nephrops norvegicus*) and typically have a low headline height, reduced sweep length and a narrow fishing circle, when compared to most single rig and twin-rig prawn trawls used by industry.

In scientific comparative sea trials, a multi-rig trawl was found to catch around 50% fewer cod than an industry standard trawl (control trawl) while prawn catches were almost double (+ 95%) that of the control trawl. Whiting were reduced in the multi-rig (-60%), while flatfish landings were broadly comparable between the two trawl types.

These North Sea comparative fishing trials were conducted during March/April 2009, onboard the Whitby based trawler 'MFV Success III' WY 212 (Fig.1) skippered by Andrew Leadley (Fig.2). Skipper Leadley currently fishes for prawns with a multi-rig in a quad formation in the North Sea, as do a number of Danish fishermen.

This work provides new data on the relative selective properties of multi-rig prawn trawls and may be of interest to fishermen, scientists and managers in situations where cod protection is of particular interest.



Figure 1. MFV Success III (LOA 21m, 630 HP)

Method

In this study, the catches from a multi-rig prawn trawl were directly compared to those from a common design of commercial prawn trawl.

Using a centre clump and triple warp arrangement, a 'pair' of multi-rig prawn trawls were repeatedly towed (at 3 knots) directly alongside a larger single prawn trawl (Figs. 3 & 5). Both gear types were shot and hauled at the same time and were swapped over sides every other haul to eliminate any potential side bias. Hauls were made throughout day and night and all the trawls were fitted with new and identical cod ends (mesh size 99mm).



Figure 2. Skipper Andrew Leadley

A total of 16 consecutive commercial (5-hr) tows were completed during six days of continual fishing (27 March – 01 April 2009). Onboard Cefas scientists measured the catches throughout the trip.

The study was undertaken in the Silver Pits area of the North Sea (Location 53-55°N, 001-003°E, ICES rectangles 36F1, 36F2, 36F3, 37F1 & 37F2)

Vessel Agents for the Success III

Caley Fisheries (North Shields)
Contact: Andy Dixon 0191 257 2491

Fish (Common and *Latin* names)

Prawns: *Nephrops norvegicus*
 Atlantic cod: *Gadus morhua*
 Whiting: *Merlangius merlangus*
 Plaice: *Pleuronectes platessa*
 Lemon sole: *Microstomus kitt*
 Rays: *Raja* species

Table 1: Some basic catch data from the sea trials

<i>Catches for market</i>	Multi rig	Control
Cod (Kg)	30	67
Whiting (Kg)	92	227
Prawns (Kg)	59	30
Flatfish (Kg)	112	97
<i>(lemon sole, plaice & rays)</i>		

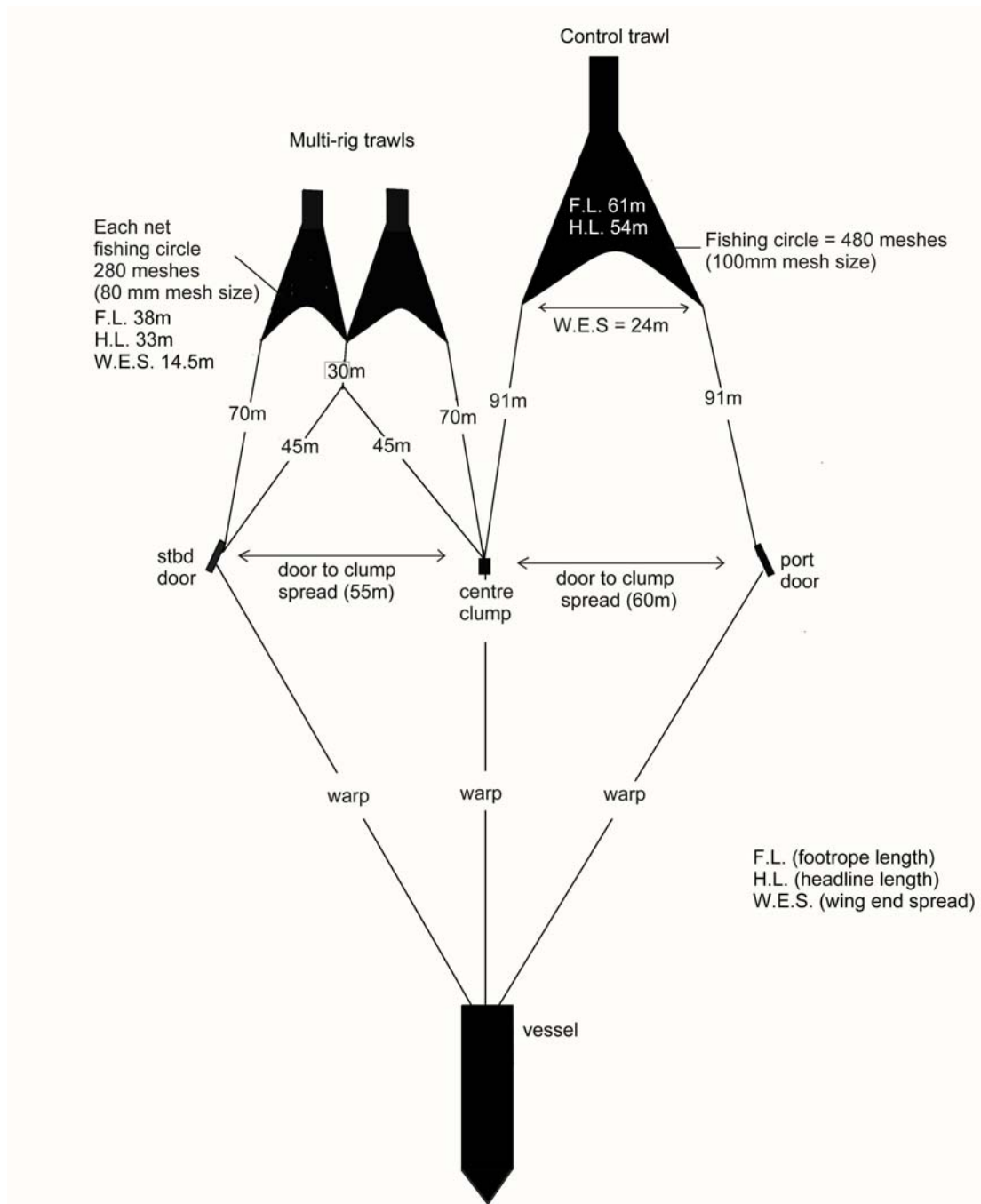


Figure 3. Gear rigging during the trials

Figure 4: Comparison of the total cod catches during the trials

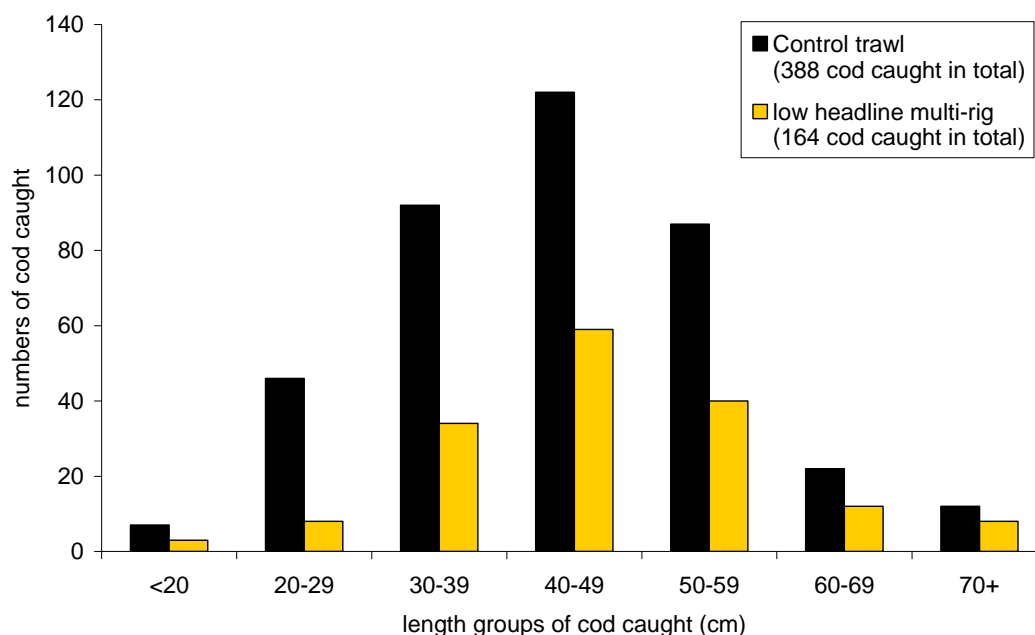


Figure 5. Shooting the gears during the trials (multi-rig on port side for this haul)

Results

Cod: A total of 552 cod were caught during the trip, of which 388 were caught in the control trawl and 164 were caught in the multi-rig. A statistical analysis ⁽¹⁾ of the cod catches (from the individual hauls) indicated that cod reductions of (- 46%) occurred across the full length range (Fig. 4).

Other species: In terms of gross weights landed for market, the multi-rig caught 95% more prawns and 60% less whiting than the control trawl. Catches of flatfish were broadly comparable (Table 1).

Conclusions and discussion

Cod: It is not certain why the multi-rig trawl caught around 50% fewer cod than the control trawl, however it is likely that its unique construction, i.e. low headline (~ 0.5 fathom), restrictive fishing circle and reduced sweep length (Fig. 3) were responsible for this effect.

The catch compositions in these trials are not wholly representative of the commercial fishery, as cod was deliberately targeted here in order to investigate the relative catching efficiency of the two trawl types. Of more importance are the relative differences in the catches between the two gear types.

However, in July and Sept 2008, Cefas observers sampled two full commercial fishing trips aboard the Success III while multi-rig gear was in use. During those trips, the cod caught comprised 9% (404 Kg) and 1.3% (51 Kg) of the total catch respectively.

Prawns: Prawns were scarce on the fishing grounds throughout the comparative trials; however the multi-rig caught almost double the quantity of prawns compared to the conventional trawl, albeit in fairly low quantities. This may be due to differences in trawl construction or wing end spread etc.

This work provides some evidence on the relative selective properties of multi-rig trawls. These findings may be of interest to fishermen, scientists and managers, particularly in situations where cod conservation is of interest.

Reference for the statistical method used

(1) Holst R., Revill A. A simple statistical method for catch comparison studies. Fisheries Research 95 (2009) 254-259

Acknowledgements

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