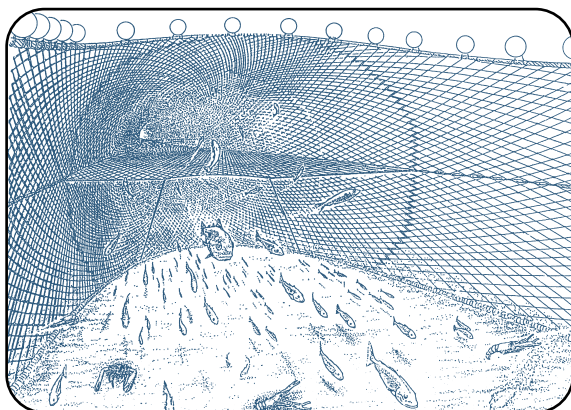




Separator Trawls



Introduction

In the demersal fisheries of the north east Atlantic, catches are typically a mixture of round-fish, flatfish and shellfish. Restrictive catch quotas are set for each species to conserve the stocks of those under intense fishing pressure. In the whitefish fishery however, using 100 mm cod-ends, fishermen cannot easily avoid catching fish, such as cod and saithe, for which quotas may be exhausted early in the year. These fish cannot be landed and must be discarded and are lost to the fishery. In the 70 mm *Nephrops* fishery, a small by-catch of whitefish is permitted but easily exceeded, and must also be discarded. This loss of marketable fish is a persistent problem for fishery management which reduces the effect of the conservation measures. Fishing gears which could separate species and release those which cannot be landed would greatly aid stock conservation, and such gears have been developed.

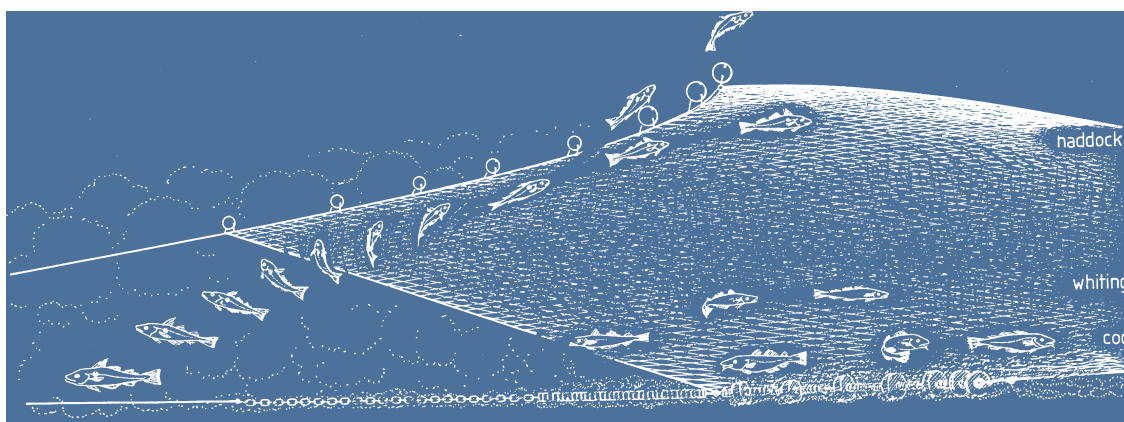
Separating Species

Capture in trawls is not a passive process but depends largely on how fish react to the net. The species caught in the UK fisheries vary widely in shape, size and behaviour offering some scope for devising separation systems. Shape and size differences are the basis for cod-end mesh selection and grid selection, described in other leaflets in this series. Behavioural differences between species like cod, haddock and *Nephrops* present real possibilities for dealing with mixed catches.

Fish nearing the mouth of a trawl turn and swim along with the net until exhausted. The faster the towing speed, the sooner the fish tire and small fish have less endurance than large fish of the same species. Saithe, mackerel and herring can swim faster and further than cod, whiting and haddock, and escape from slowly towed nets. Faster towing reduces selection. Herded fish remain close to the sea-bed unless numerous, when they stack up and swim as a shoal. When they are no longer able to keep up they turn and enter the body of the net but at different levels. Haddock rise high, cod stay low and whiting are in the middle. *Nephrops* and flatfish also stay low and keep close to the groundgear and lower netting panel. If the groundgear is not close to the seabed, they can escape under the net.

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To use this behaviour to separate fish species, a horizontal panel of netting is rigged within the trawl body, splitting it into upper and lower sections. The panel extends





throughout the net to reach two cod-ends, one above the other. These cod-ends can have different mesh sizes appropriate for the species captured and separated. In the *Nephrops* fishery, the lower cod-end could be 70 mm mesh and the upper cod-end 100 mm mesh. This would separate haddock and whiting from *Nephrops*. In a mixed cod and whiting fishery, the whiting will move to the upper cod-end which could be 80 or 90 mm mesh, whilst the cod will enter the lower cod-end which could be 120 mm to release small cod.

The positioning of the leading edge of the separating panel is critical to achieving consistent separation. The

front of the panel should be slightly ahead of the ground-gear, otherwise fish will drift back too far before turning and rising. Panel height needs to be varied to get the best results and this is achieved by fixing adjustable quarter ropes between panel and groundgear. The cod-ends are of different lengths to make handling easier at the surface.

Trials have shown that these nets can work well under commercial conditions but they are more complex and costly (about 30%) than conventional trawls. Clearing two cod-ends each haul is more time consuming but improves the catch quality in the upper cod-end which never contains any debris.

