

Figure 1:
A good haul of
only large cod

Pelagic trawling for cod

Pelagic trawling does no harm to benthic fauna and reduces bycatches, and is sometimes an alternative to bottom trawling when fishing for cod. Selection abilities are the same as for bottom trawling. A newly developed concept (also applicable to bottom trawls), which has a four-panel extension and cod-end, stabilises the trawl geometry and improves selectivity.

BY TERJE JØRGENSEN AND JOHN WILLY VALDEMARSSEN

Bottom trawling has a bad reputation due to the damage it inflicts on benthic organisms such as corals, and in some countries bottom trawling is prohibited in vulnerable biotopes. Cod can sometimes be found in mid-waters, and can therefore be caught using a pelagic trawl, thus preventing damage to benthic fauna.

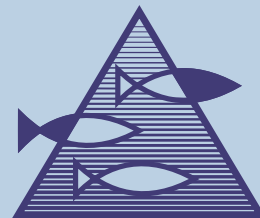
In the 1960s and 70s, pelagic trawls were used to fish for cod and haddock in the Barents Sea, but this was banned in 1979 due to the large bycatches of undersized fish and high discard rates. However, current technical regulations and stock management policies should

mean that pelagic trawling would not cause those problems today. The Institute of Marine Research therefore initiated a project to investigate the possibility of restarting this method of fishing.

FINDINGS

Five field trials were performed with a pelagic trawl. During three of these trials, commercial quantities of cod (see Figure 1) were observed and caught. Overall, the results of the trials suggest that pelagic trawling could supplement, but not replace, bottom trawling. Observations of cod behaviour revealed that fish in mid-waters dived when a





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▶▶ Pelagic trawling for cod

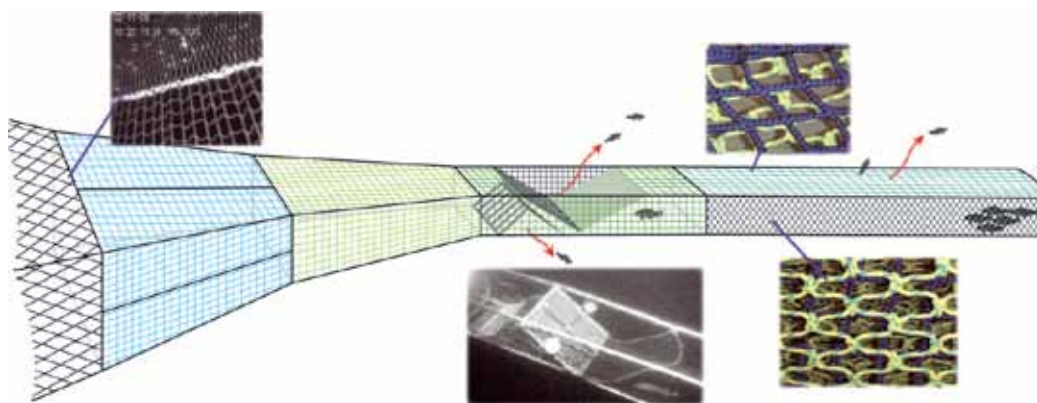


Figure 2:

The new design concept for the back end of the trawl net. Belly/extension piece with square mesh panel, square mesh BRD in four-panel section and cod-end with top panel using square mesh and side and bottom panels using T90 mesh.

vessel passed, but there was no indication that the cod attempted to escape through the large meshes at the front of the belly of the trawl.

When a pelagic trawl is used, cod do not swim in front of its mouth until they are exhausted, as has been documented for bottom trawls. The problem of the bycatch of capelin that gets trapped in the back part of the belly and the extension piece was effectively solved by using webbing with T90 or square mesh.

NEW CONCEPT

As part of the project, a new kind of trawl net, with a four-panel cod-end and extension piece, was developed (see Figure 2). It uses square mesh in the top panel of the cod-end and in the entire extension piece. The extension piece has a grid bycatch reduction device (BRD) fitted. The new system ensures the stable geometry of the cod-end and extension piece, whereas with a two-panel design with diamond mesh it has been shown that the extension piece narrows in response to longitudinal forces, e.g. when the cod-end starts filling up with fish. This can reduce the effectiveness of the trawl and prevents fish from being transported back to the BRD and cod-end. The fish may then only be exposed to the BRD when the trawl is hauled in, and selection will to a great extent take place near the surface. This has been shown to reduce the survival rates of unwanted fish. Furthermore, the catch sensors do not work properly if the fish are not transported back into the cod-end.

Two selectivity trials were carried out with commercial vessels. During the first trial, the catch

was too small to allow selectivity calculations, whereas in the second trial only fish above the selection range were caught. Selection data from experiments with research vessels indicates that size selectivity (L50 and SR) for cod is at least as good as with a bottom trawl (if using the same BRD and the same mesh size in the cod-end). Using the new design without a BRD resulted in equally good selectivity as with the BRD. The cod-end itself is therefore capable of considerable selectivity. The experiments also suggest that pelagic trawling resulted in a smaller bycatch of other species than is normal with bottom trawling.

PRACTICAL VALUE AND APPLICATIONS

Certifying the catch process is becoming increasingly important when selling fish and fish products. Moving from bottom trawling to pelagic or semi-pelagic trawling can help to make trawling activities in the Barents Sea more sustainable. The new selection concept with square mesh improves selectivity and catch control. Pelagic trawling may also be more efficient than bottom trawling, thereby reducing oil consumption per kilo of fish caught. This would both improve profitability and reduce NOx emissions.

OTHER RELEVANT INFORMATION

Pelagic trawling trials will continue in 2010. This will involve continuing work on the new four-panel concept and developing a catch-limiting device to prevent excessive catches when fishing in areas with high fish densities. The new concept is being developed in partnership with Russian scientists from PINRO, and the equipment has been tested on a Russian research vessel.

