We all know there are big challenges ahead for the fishing industry in stepping up efforts to reduce discards. With the increasing importance of social, economic and political factors as a big part of the issue, Seafish gear trial work over the last 15 years is increasingly relevant and is now being rolled out in commercial fisheries.

In the last in a series of articles, Mike Montgomerie, Gear Technologist at Seafish, gives his perspective on the issue and the work Seafish, along with industry, has been doing to help develop new selective technologies and net-based fishing activities to reduce discards. In this article he discusses the use of flexible and rigid grids.

A variety of different flexible

Making the most of grids to reduce discards

Flexi grid in the top of a cod end extension to act in a similar manner to a square mesh panel
Rigid grids are used in many fisheries throughout the world and have proved to be a very efficient tool for the separation of species in trawls. Because they are a rigid structure it is fairly easy for fishers to regulate the grids overall dimensions, bar spacing and method of fitting. This helps to ensure consistency in its sourcing/protecting-fish-stocks/discards or by phoning Mike Montgomerie on 01472 252327.

Further advice on fitting and operating these devices is available from Seafish either on the website http://www.seafish.org/fishermen or http://www.seafish.org/fishermen/responsible-fishing.html.

This final article in a series of six which have covered the reasons why fish are discarded and other activities than can be used to reduce discards including square mesh panels, separator panels and grids. It is important to ensure that the discard reduction device to be its most effective a flexible grid really needs to be fitted further up the trawl, where there is sufficient mesh on the circumference to allow the grid to be as controllable as possible. A large grid gives the catch larger exposure to the grid than a smaller grid and should improve its efficiency in the long term.

Flexible grids are most efficient when there is a big difference between the size of the target species and the size of the fish or shellfish that are to be excluded from the trawl, as in the turtle excluder device. Larger bycatch is targeted and allowed to escape the trawl.

A variety of grid designs are already in use, including grids with different bar spacings, vertical bars and horizontal bars and some with a gap at the bottom to allow the retention of bottom fish and prevent the build up of bottom debris. The size and shape of a grid needs to be modified to suit the specific fishery, taking into account the vessel handling arrangements and the species to be discarded. With careful consideration of the fishery and the grid designs, 100% of the larger fish have been shown to be released.

Fitting rigid grids

Grids for the separation of species in trawls. A rectangular grid it may be better to fit a four panel (or boxed) section into the netting. To be its most effective a flexible grid really needs to be fitted further up the trawl, where there is sufficient mesh on the circumference to allow the grid to be as controllable as possible. A large grid gives the catch larger exposure to the grid than a smaller grid and should improve its efficiency in the long term.

Flexible grids fitted in bottom panel

If a square or rectangular grid is fitted into a standard two panel net out there will be no obvious distortion of the meshes around the corners - it is like fitting a square peg in a round hole! This distortion will allow larger target species to escape and, in the longer term, will cause chewing and abrasion of the netting. Ideally an oval-shaped grid should be used in a two panel net but for a rectangular grid it is better to fit a four panel (or boxed) section into the trawl to accommodate the grid without distortion of the meshes. A rectangular grid will fit the cross-sectional shape of the trawl and should improve its efficiency in the long term, will cause chewing and abrasion of the netting. Ideally an oval-shaped grid should be used in a two panel net but for a rectangular grid it is better to fit a four panel (or boxed) section into the trawl to accommodate the grid without distortion of the meshes. A rectangular grid will fit the cross-sectional shape of the trawl and should improve its efficiency in the long term.

Rigid gRids

Flexible grids fitted in top panel

Several grids have been working on a grid for selecting the smaller Nephrops. This grid is inclined at 45 degrees and dropped into the bottom panel of the trawl. This allows all the Nephrops to escape. It depends the animals up onto each other and into the smaller classes of vessels which use net drums and power block to handle the gear. Some types of rigid grids are made using several hinged sections which makes them more manageable onboard, but allows them to retain their effectiveness in species separation in the water.

A wide variety of grid designs are already in use, including grids with different bar spacings, vertical bars and horizontal bars and some with a gap at the bottom to allow the retention of bottom fish and prevent the build up of bottom debris. The size and shape of a grid needs to be modified to suit the specific fishery, taking into account the vessel handling arrangements and the species to be discarded. With careful consideration of the fishery and the grid designs, 100% of the larger fish have been shown to be released. Recently several grids have been trialling grids made from semi-rigid plastic materials. This enables the grids to bend as they are wound onto a net drum, but returns to their flat form once the net is cut. This will also make the grid much easier to use in the typical trawl, and for the small Nephrops it will be necessary to combine the small Nephrops with larger ones upwards into the small ones and deflecting the exposure to it, releasing the shrimp fisheries to separate the shrimp to escape.

Flexible grids with several hinged sections fitted in the sides of a codend extension to allow the release of small fish

This was probably due to the shape and overall size of the Nephrops. This grid is inclined in the turtle excluder device in the top panel of the trawl. The rigid grid is fitted in the trawl ahead of the codend, inclined at an angle of approximately 45 degrees, with the bar spacing designed to allow the target species to pass through between the bars and into the codend. The larger bycatch is directed up and out of the net by the inclined netting panels fitted in the sides of the trawl. The fish are scattered and the amount of fish being caught. If the fish are scattered and the net is in effect ‘filtering’ the water, the fish will probably get easy access to the grid. However, it is more usual in pelagic trawling to target shoals of fish, where a large volume of fish will be passing beneath the grid at one time and only the ones at the top of the net will get exposure to the grid, thereby the opportunity to escape.

Flexible grids with several hinged sections fitted in the sides of a codend extension to allow the release of small fish.