Fisheries technician Michael Wooden checks a 'square-mesh codend' on board a Clarence River prawn trawler. Commercial fishers and scientists are cooperating closely to reduce wasteful bycatch.
Peter Garside/Alcoa.

Cooperation nets the benefits of bycatch reduction

Prawn fishers and scientists have spent the last 10 years investigating the best way to reduce the wasteful bycatch of undersize prawns and important non-target fish species, such as juvenile bream, luderick and snapper, during commercial prawn trawling on the north coast of New South Wales.

A key aspect of the work was the development of special bycatch reduction devices, inserted into the nets of all Clarence River estuary prawn-trawlers, which allow small unwanted fish and other species to escape, while retaining most of the targeted sizes of prawns.

'This bid for a more sustainable fishery is the first wide-scale, voluntary adoption of such new technologies by Australian fishers,' says Dr Steve Kennelly, Chief Scientist with the NSW Department of Primary Industries (DPI).

DPI Fisheries Principal Scientist Dr Matt Broadhurst says that it is gratifying to have such a high level of industry cooperation. 'After developing and testing the modified nets, we hand them out to the commercial fishers who trial them, give us feedback or make their own improvements … and let us scientists on board to observe and collect data,' he said. 'It doesn't always happen this way in other parts of the world, but the Clarence River prawn-trawlers have been great research partners and we have built a very close relationship with them.'

'…there is no doubt that bycatch reduction saves millions of fish a year…'

Excessive bycatch is a worldwide problem, and the tendency for early legislation to simply reflect the methods and gear already in use by the industry didn't help matters. However, in NSW, bycatch reduction measures were mandated in 2000 and, in recent years, NSW Fisheries scientists have continued their research to further reduce bycatch by improving on the current techniques and devices with a view to tightening up regulations.

Dr Broadhurst explains that there are two basic approaches to separating target and non-target organisms – mechanical and behavioural. 'For example, in the Hawkesbury River we largely overcame the problem of catching small mulloway in prawn trawls by inserting escape panels at strategic locations in the bag where the catch collects (termed the codend). These panels work because these fish tend to school and rise upwards, while prawns behave differently, naturally heading downwards.'

In the Clarence River prawn trawl fishery, the researchers and fishers have been investigating both mechanical and behavioural devices to reduce the bycatch of bream and other important fish species, as well as undersize prawns.

Fortunately, most bream and other fish more than about 20 cm long don't get caught in prawn trawls, because their 'burst speed' exceeds the trawl speed of about 1.2 m per second – they can usually outswim the trawl. So the trick is to somehow allow the remaining smaller fish to escape.

One way is to use a 'Nordmøre grid' – first developed in Norway to keep jellyfish out of nets. This has proved effective in Australia at reducing fish bycatch. The Nordmøre grid used in the Clarence River has bars about 20 mm apart that direct fish up at an angle of 45 degrees towards an escape opening at the top of the trawl net. This mechanical separating device allows about 90% of the bream to escape, leaving only the very smallest fish still in the funnel-shaped net with the prawn catch.

'We have also found that codends made from square-shaped mesh are a great improvement, because they don't distort like the traditional diamond-mesh nets,' says Broadhurst. 'They allow many small fish and undersize prawns to escape, but still maintain catches of the targeted-sized prawns.'

Dr Kennelly says it is very difficult to put a dollar figure on the value of bycatch reduction, but there is no doubt that it saves millions of fish a year and has tremendous conservation and commercial value.

'Fishers also see the benefits,' he says. 'They don't like killing fish unnecessarily, they hate sorting bycatch … and they know that the alternative to bycatch reduction is for authorities to close commercial fishers out of areas.'

'Involving commercial fishers in the research from the outset, and over many years, has been beneficial to all involved and we have found that it ensures greater compliance with regulations and therefore a more sustainable fishery.'

● **Steve Davidson**

Contacts:
Matt Broadhurst, (02) 6648 3905
Steve Kennelly, (02) 9527 8532