

Bycatch, trawling and sustainability

Bycatch is the accidental capture of unwanted or non-targeted plants, fish or other animals. Even the average recreational fisher finds it difficult to prevent bycatch. But by reducing bycatch, fish and other animals are returned back into the water and into the food web. This helps maintain biodiversity; protects endangered and vulnerable species, makes it safer for fishing crews and increases the value of the catch.

What does bycatch include?

- Species of little or no commercial value.
- Protected or endangered species, e.g. sharks, turtles, sea snakes, sea lions and sea birds.
- Species caught out of season, in closed waters, the wrong size (too big or too small) or too many.
- Plants and animals such as corals, seagrasses, algae and sponges which are floating or have been dislodged from the ocean floor.
- Debris such as rocks and rubbish.

Incidental catches can still be valuable. Species that are kept and sold by commercial fishers but are not necessarily targeted are called 'byproduct' rather than 'bycatch'.



Photo: Mervil Kangas

Bye-bye bycatch!

- Scientists and the fishing industry have worked hard to develop methods that reduce bycatch as much as possible.
- There are a number of methods to prevent or reduce bycatch and they depend on the type of fishing gear used, the animals in question and their behaviour.
- Methods can include changing management arrangements, such as fishing at night, and spatial and temporal closures to protect breeding aggregations (groups) of fish, or specific habitats (sea grass beds).
- Some fisheries have a total bycatch allowance (called a trigger limit) and once reached, fishing must stop.
- Many modifications are tailored to the biology or behaviour of unwanted animals and have become mandatory in many commercial fisheries.



Less bycatch means catches are quicker and easier to sort; there is less chance of prawns being crushed by larger animals, so their value increases; and may improve drag dynamics during trawling, so fishers could potentially use less fuel, saving money and reducing emissions.

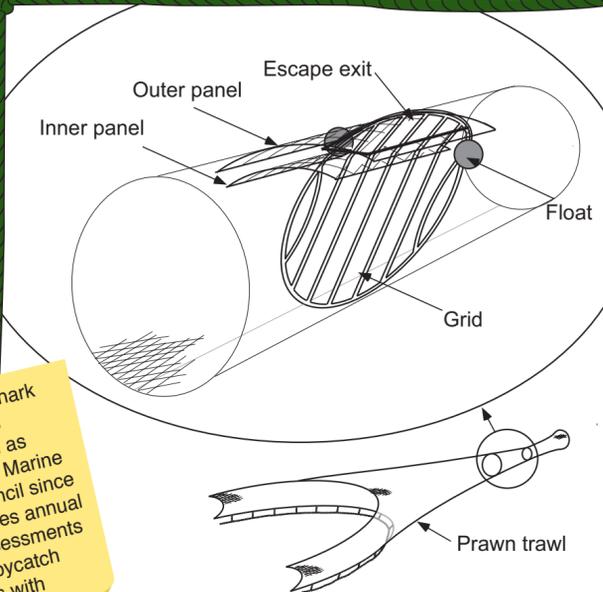
Why worry about bycatch?

- Bycatch takes food away from other species.
- By reducing bycatch, we help to protect endangered and vulnerable species such as turtles, dolphins and albatrosses.
- Sorting catches and discarding bycatch can be expensive and dangerous.
- Fishing crews are safer through keeping out large thrashing and potentially dangerous animals, such as sharks and rays.

The Exmouth and Shark Bay prawn fisheries have been certified as sustainable by the Marine Stewardship Council since 2015. This includes annual independent assessments of the fishery's bycatch and interactions with protected species.

Bycatch reduction devices (BRDs)

BRDs are any device incorporated into fishing gear to reduce or exclude unwanted catch, e.g., grids and mesh panels installed in prawn trawl nets to channel bycatch out through an escape hatch while retaining the prawns. There are several different types of BRDs, designed specifically for the fishery they are being used in and the potential bycatch. The use of BRDs has been compulsory in WA's prawn and scallop trawl fisheries since 2004.



Whilst FEDs also allow some prawns to escape, they have been shown to reduce the catch of active fish species by around 20-70% and some individual fish species by 90%.

Grids and FEDs

Grids and fish escape devices (FEDs) are examples of bycatch reduction devices used in trawling.

A grid is a frame containing vertical bars that is fitted into the net at an angle to assist larger animals to escape from the net. Turtles, sharks, rays and other large fish cannot pass through the bars and are instead channeled out the trawl net through an opening flap, whilst still in the water.

FEDs can take several forms:

- Grids fitted to trawl nets to stop larger fish being retained, passing them out through escape hatches.
- Square mesh panel (fish-eye) sections positioned before the cod-end to release smaller fish.
- Fishing nets can be designed to catch fish in a certain size range by altering mesh width, e.g. nets can be a mesh size small enough to allow larger individuals to bounce off if they swim into them, or conversely, a large mesh size allows smaller individuals of target species (i.e. undersize prawns) to swim through.

Hoppers

Some bycatch, just can't be excluded – it may be the same size and have similar behaviour as the target catch – but damage can be reduced with careful handling.

Large hoppers (back deck water tanks) are used on most Australian prawn trawlers. These holding tanks keep the whole catch in seawater while it is being sorted increasing survival of many species. Bycatch animals are released back to the ocean alive, and the time spent sorting is reduced which is better for the environment and the fishers!

BRDs in prawn fisheries have been shown to reduce bycatch of turtles by 95%, sharks by 87%, rays by 88%, tailor by 50% and sponges by 100%.



Photo: Mervil Kangas

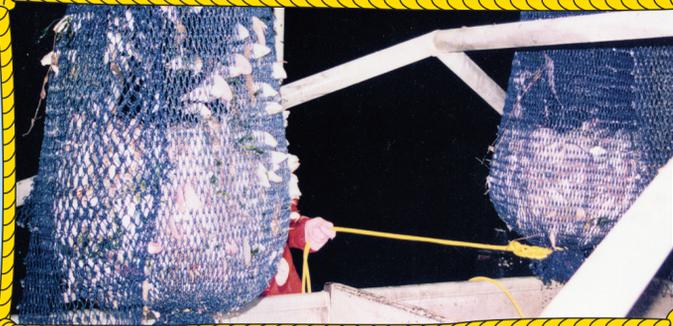


Photo: Errol Sporer

Trawling – what is it?

Trawling is a fishing method using nets towed behind a boat. Demersal trawling catches animals that live on or near the seabed, whilst pelagic trawling catches animals in the middle or upper levels of the water column.

Trawling in Western Australia is carefully managed by DPIRD, in collaboration with the fishing industry itself. Management controls ensure that the impact on the environment is reduced as much as possible, whilst also ensuring that the fisheries remain sustainable.



Ins and outs of trawl nets

Trawl nets are funnel shaped and have a closed off tail, called the cod-end, where the catch is collected. The cod-end is closed by a drawstring, which allows the catch to be emptied from the cod-end easily. The top of the net is called the headline or floatline, while the lower edge is called the footrope. Attached to the footrope is a chain, called the ground chain, that maintains the shape of the net. The actual opening of the net is limited by the height of the otter boards, which pull the trawl net out horizontally.



Photo: Joshua Brown

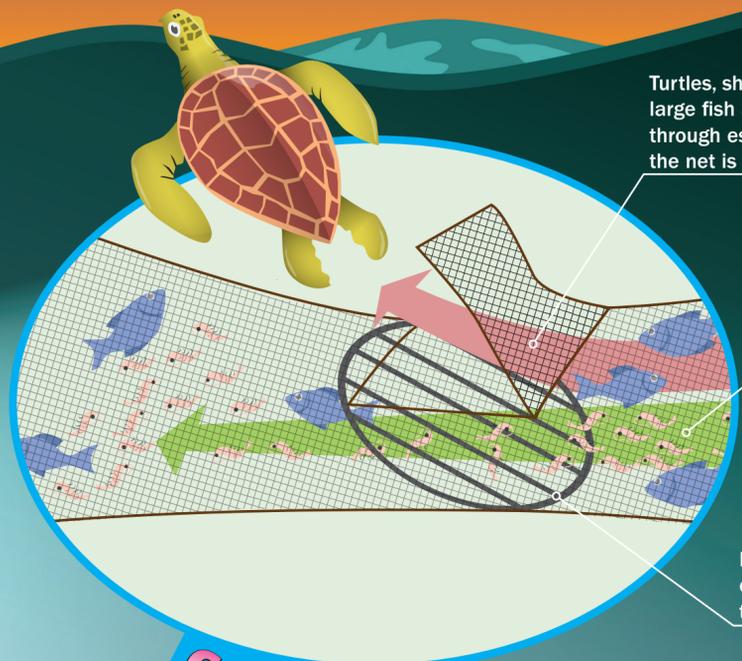
Bycatch reduction



KILGORE, THE 'FISH FROM THE FUTURE' HERE, REPORTING FROM THE OCEAN DEPTHS...

...BYCATCH IS THE ACCIDENTAL CAPTURE OF ANIMALS (AND PLANTS) OTHER THAN THE ONES BEING TARGETED. REDUCING BYCATCH ALLOWS FISH AND OTHER ANIMALS TO BE RETURNED TO THE WATER ALIVE, WHICH IS GOOD FOR THE ANIMALS AND THE ENVIRONMENT, AS WELL AS THE FISHERS THEMSELVES...

...MODERN TRAWLING NETS IN WESTERN AUSTRALIA ARE EQUIPPED WITH BYCATCH REDUCTION DEVICES THAT ARE INCORPORATED INTO FISHING GEAR TO REDUCE OR EXCLUDE UNWANTED CATCH. THESE DEVICES, AS WELL AS OTHER ASPECTS OF THE GEAR USED AND THE WAY THE FISHING IS CARRIED OUT, REDUCES THE IMPACT ON THE ENVIRONMENT, WHILST ALSO ENSURING THAT THE FISHERIES REMAIN SUSTAINABLE.

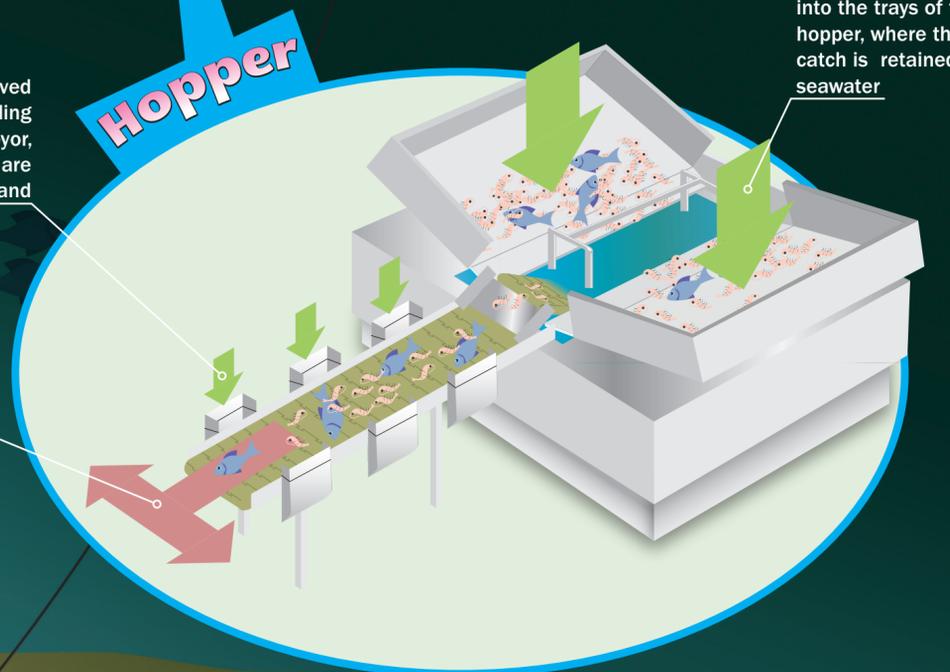


Turtles, sharks, rays and other large fish are directed out through escape hatches while the net is still on the sea floor

Prawns and other smaller animals pass through the bars of the grid and may be caught

Large marine animals cannot pass through the grid

Grid

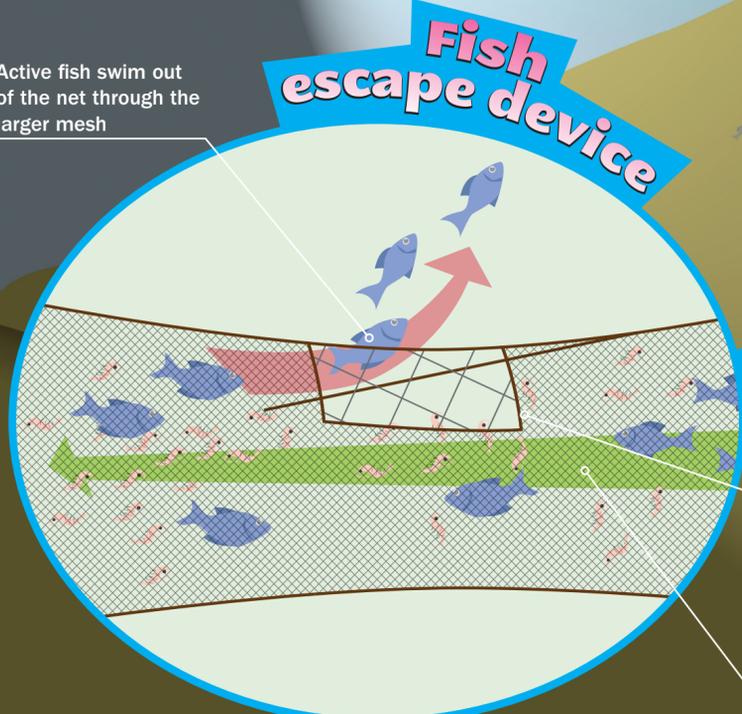


The catch is moved out of the holding tank along a conveyor, where the prawns are sorted by hand

Nets are opened into the trays of the hopper, where the catch is retained in seawater

Bycatch is returned to the ocean

Hopper

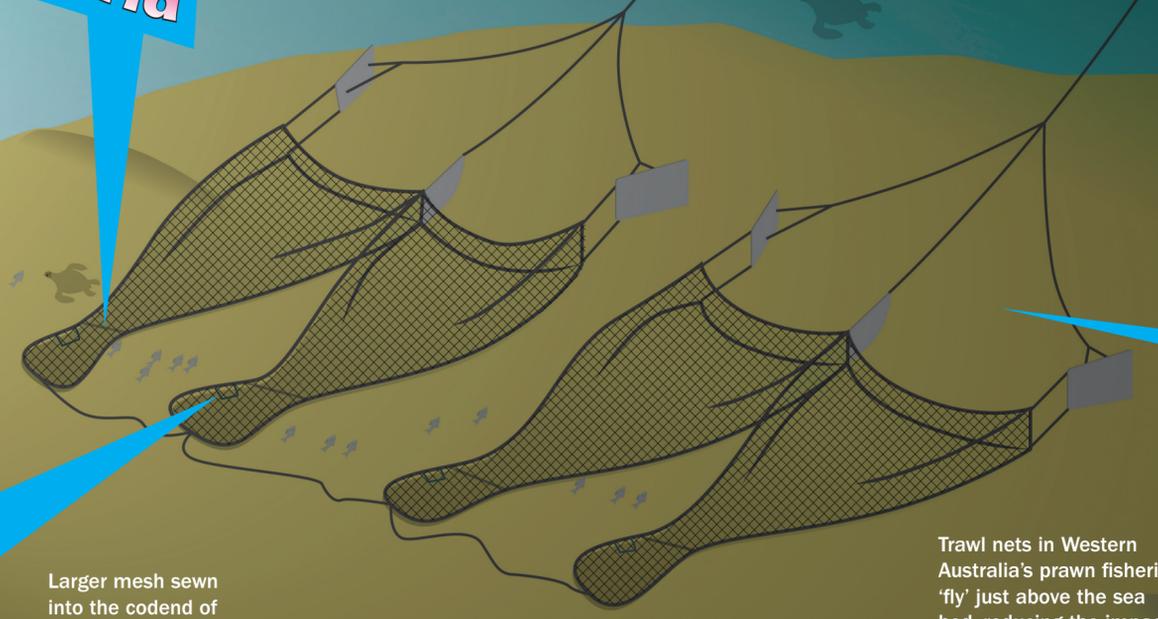


Active fish swim out of the net through the larger mesh

Fish escape device

Larger mesh sewn into the codend of the net, where the catch is collected

Some prawns may escape, but most are caught in the net



Trawl nets

Otter boards pull the net out horizontally, keeping the bottom of the net just above the sea bed

Trawl nets in Western Australia's prawn fisheries 'fly' just above the sea bed, reducing the impact of the net on things living or growing on the bottom

The only part of a trawl net that touches the bottom is the ground chain, which bounces gently along the sea bed to 'excite' prawns into the water column, to be scooped up by the net