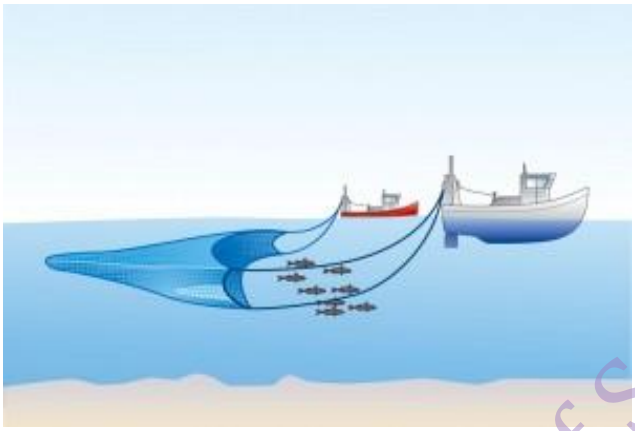
Types of Fishing Method and Examples of target species

Trawl Net



Funnel-shaped nets that are towed behind a fishing vessel through the water column at a predetermined depth, or along the seafloor. As the net travels through the water, fish are engulfed by the open mouth of the net and accumulate in the closed-off rear, called the cod end. Angled panels at either side of the mouth, called otter boards, keep each end spread apart while the net is being pulled. Floats along the top and weights or a hydrodynamic depressor along the bottom ensure that the mouth remains vertically separated. There are two major subcategories of trawling: mid-water or pelagic trawling, and bottom or benthic trawling.

- Bottom trawling drags the trawl net directly along the ocean bottom. This direct contact results in a high amount of damage to benthic habitats, which are often slow to recover, or fail to recover at all.
- Mid-water trawling often employs larger nets, however, mid-water trawls do not typically come into contact with the bottom this technique causes less damage to marine habitats.

Both methods result in high rates of bycatch; particularly bottom trawls, which are notorious for harvesting large amounts of unwanted species including sea turtles and marine mammals. To combat this, the mesh-size of trawl nets used in some fisheries is regulated to permit smaller, undesired species and juvenile target species to evade capture by slipping through the netting. Devices to facilitate the escape of turtles, seals, and sea lions have also been developed. These include metal grates placed toward the rear of the net and angled toward an escape portal cut into the top or bottom. The grate allows smaller fish and crustaceans to pass through and into the cod end, while turtles or marine mammals are directed through the portal. Trawling is one of the most widely used commercial fishing methods and is practiced around the world in many different fisheries. It is one of the methods used to catch Atlantic mackerel, anchovy, and sardine which are

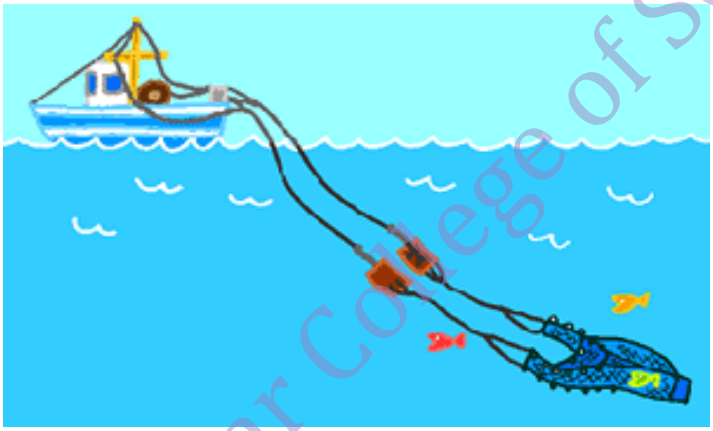
among the species listed on the KidSafe "Best Choices" seafood list. It is also used to catch certain varieties of flounder, orange roughy, Chilean Seabass, and other species.

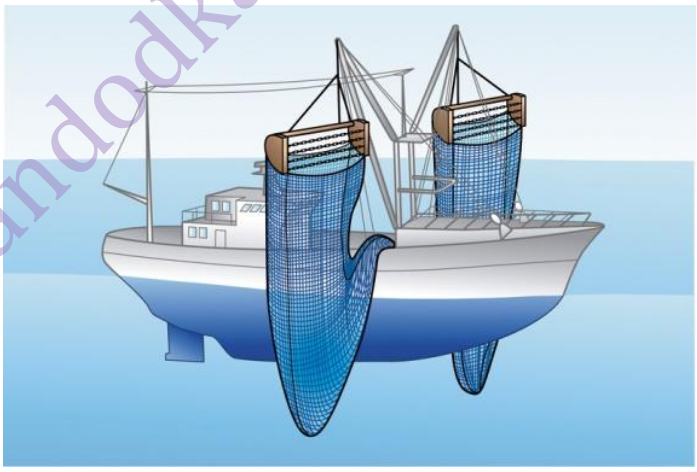
Otter (single), twin-rig and pair trawlers:

Target: Otter and pair-trawls – cod, haddock, whiting and flatfish

Target: Twin-rig trawl – langoustine and prawns

In demersal trawl fisheries, a funnel-shaped net is towed behind either one (single trawl) or two (pair–trawl) boats. Once the net has been towed it is drawn out of the water to collect the captured fish. Twin-rig trawls follow the same principle but tow two nets. These demersal trawling methods fish along or just above the seafloor catching bottom dwelling fish.



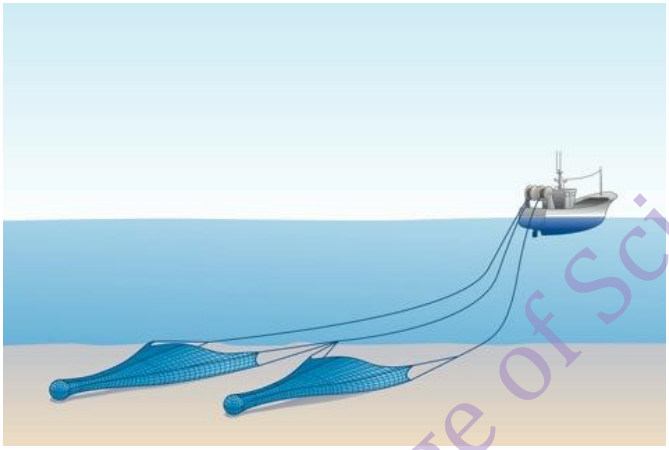


Beam trawlers:

Target: Beam trawl – flatfish, such as plaice and sole

Beam trawls target fish on the seabed. They tow a net from either side of the boat. The mouth of the net is weighted and kept open by a metal beam that can be up to 12m long. Metal 'tickler chains' are attached to the gear to disturb fish from under the surface of the seabed and into the trawl

Demersal trawling

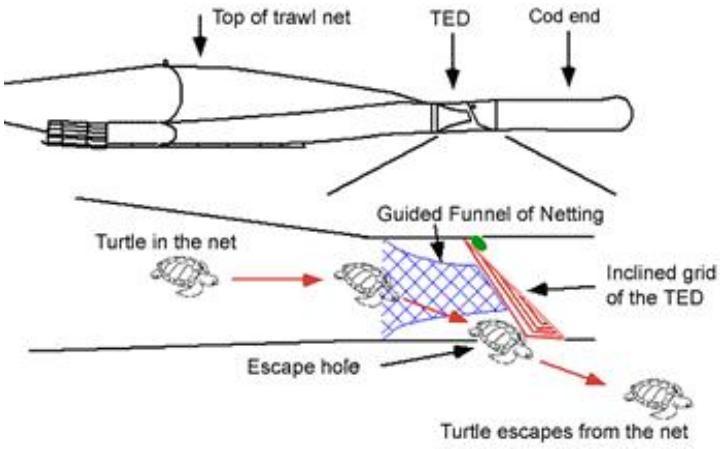


TED design

TEDs consist of either a metal or plastic grid with vertical bars running from the top to the bottom of the frame (much like a storm-water-drain grate). The grid is then installed in a tube of mesh netting.

Grids are installed in the netting at an angle of 30-55°. This creates a physical barrier that lets prawns and other animals smaller than the bar spacing pass through the TED and into the codend. Sea turtles, other large animals and debris slide along the grid to an exit hole cut in the top or bottom of the surrounding mesh. The exit hole may be partially covered by a flap of webbing to reduce the possibility of losing prawns.

When working properly, catch loss associated with these devices should be minimal. There is evidence that TEDs may improve the quality or the quantity of the prawn catch in certain circumstances. A poorly constructed or maintained TED may cause major losses in prawn catch.



TED legislation

In Queensland's east coast trawl fishery the use of TEDs with by-catch reduction devices (BRDs) is mandatory in all otter trawl nets.

The mandatory use of TEDs is helping to prevent sea turtles from being caught in Australian trawl fisheries. TEDs have been made compulsory in the following trawl fisheries of Australia:

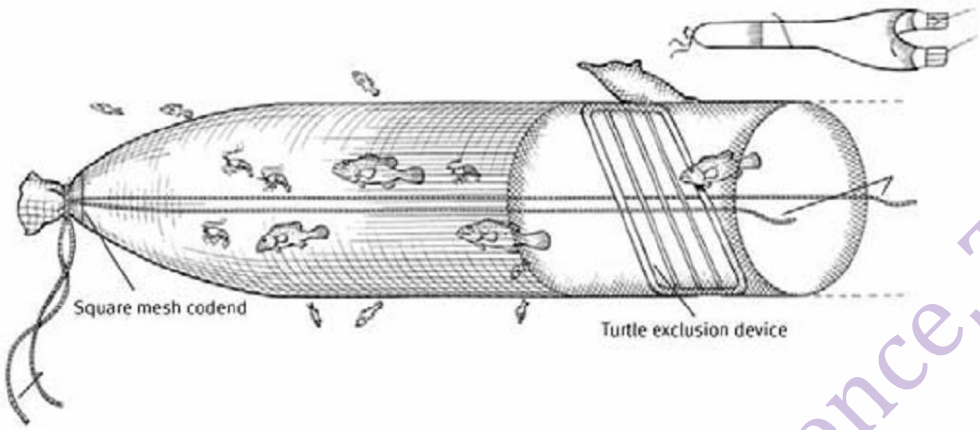
- Queensland east coast trawl fishery daytime and inshore trawling in all areas except river beam trawl
- northern prawn fishery (Gulf of Carpentaria, Arnhem Land coast and Joseph Bonaparte Gulf)
- Torres Strait prawn fishery.

While TEDs are not compulsory in all Australian fisheries, other trawl fisheries (i.e. South Australia and Western Australia) are using TEDs to improve quality of catch and reduce sorting times through less by-catch.

TEDs technical information guide

This TEDs guide provides technical information to ensure that TEDs are made to a consistent standard and are fitted correctly to trawl nets used throughout the Queensland east coast trawl fishery.

The guide and the standardized design specifications contained within it will help both net makers (to construct TEDs) and fishers (to fit and use TEDs). This will ensure TEDs effectively reduce by-catch (non-target species) while also retaining catches of target and permitted species.

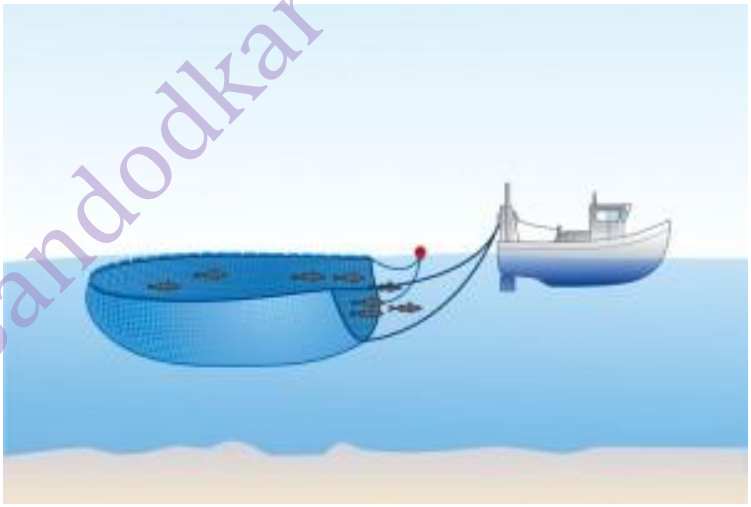


Seine netting:

Seine netters use a net that is vertical in the water, with very long ropes attached leading back to the vessel. These drag on the ground, setting up a sand or mud cloud, which herds fish into the net.

Purse Seine Net

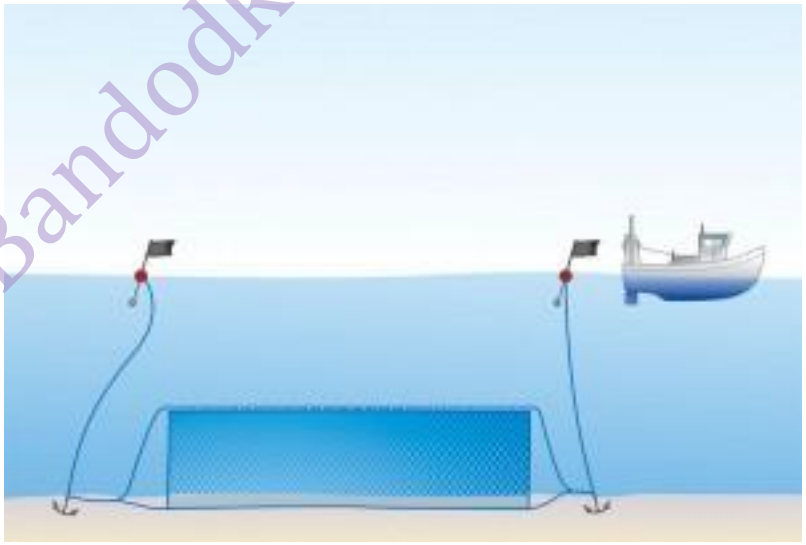
Target: Seine netting – cod, haddock and whiting



This method of fishing is used to capture large schools of fish at or near the surface. The net itself is in the shape of a long strip or wall and may be up to one kilometer in length and as deep as 200 meters. A system of weights running along the bottom and floats positioned along the top keep the

net vertically suspended in the water column. Once a school of fish has been located, which is sometimes done with the help of a spotter aircraft or radar used to detect large flocks of birds feeding at the surface, the net is then pitched into the water and pulled around the school of fish to encircle it in this "wall" of netting. After the school of fish has been completely surrounded, a rope running along the top of the net, known as the purse line, is pulled to cinch the bottom closed, like a laundry bag. This conforms the net into a bowl-like shape and the school of fish is pulled on board the fishing vessel. As this technique is employed close to the surface it does come into contact with the ocean floor and therefore does not cause any damage to bottom dwelling (benthic) organisms and habitats. Bycatch is also limited due to the nets being targeted at schools of specific species of fish, however, undesired animals feeding on those schools such as sharks, dolphins, and turtles are sometimes captured. Purse seining is practiced in many commercial fisheries around the globe, and is one of the methods used to harvest Atlantic mackerel, anchovy, sardine, and Alaska salmon which are included on the KidSafe "Best Choices" seafood list. It is also used to catch fish such as bluefin and other tuna species.

Gillnet



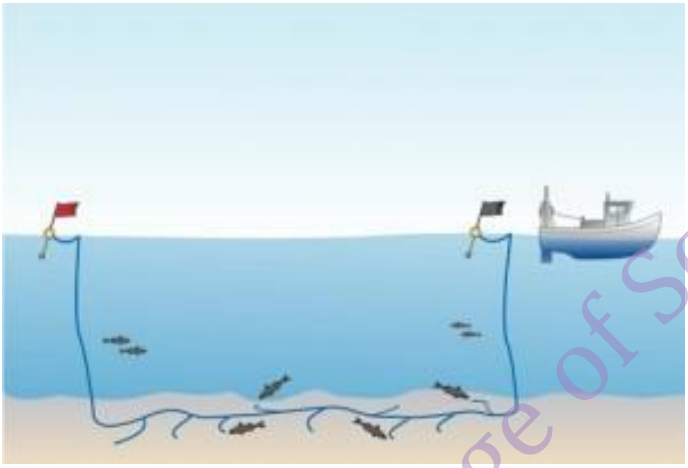
Gillnets are long strips or walls of netting that ensnare fish by their gills once they swim into the mesh. The nets are held in a vertical position by a series of floats running along the top and weights along the bottom. Gillnets may be set in a static position with the bottom running directly along the seafloor or suspended in the middle of the water column and attached to the seafloor with anchors. Another type of gillnet, also called a driftnet, is set near the surface and is allowed to drift freely. Although a degree of selectivity is provided by the size of the mesh used, which depends on the fish species being targeted, this fishing technique is associated with high levels of bycatch. Driftnets have been responsible for catching whales, dolphins, seals, sea turtles, and seabirds, as well as undesired fish species. They may also be lost or abandoned and become "ghost nets" that can drift for months, continuing to ensnare marine life. Due to these bycatch hazards the use of driftnets has been banned in some regions, and a regulation passed by the United Nations in 1991 limits the size of driftnets that can be used to 2.5 kilometers in length. Before the U.N. ban, some driftnets were up to 60 kilometers long and 30 meters deep. Alaska salmon, which is included in the KidSafe "Best Choices" seafood list, is among the species targeted by stationary and drifting gillnets. The nets used, however, are much smaller than the driftnets employed in other fisheries and bycatch is kept to a minimum as schools of salmon are specifically targeted.

Troll

Trolling is a technique that involves a fishing vessel towing a series of lines set at different depths, depending on location of the fish being targeted. When a fish takes the bait or artificial lure, the line is reeled in and the fish brought onboard. Trolling lines do not cause much damage to marine environments, as they typically do not come into contact with the bottom. This technique also has

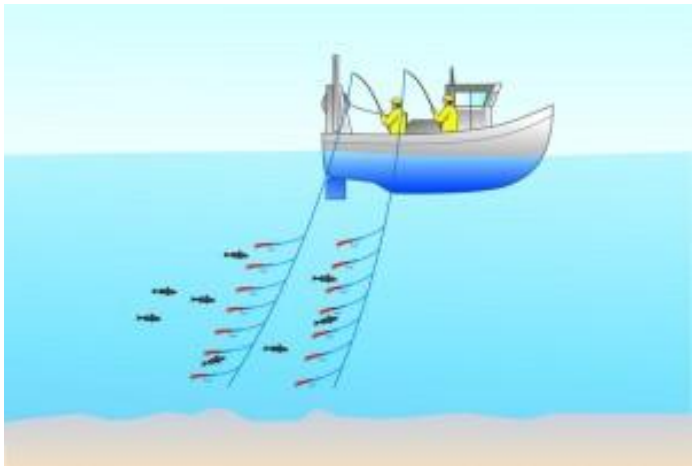
a low bycatch rate, and any accidental catches can be released after capture. Trolling is one of the methods used to harvest wild Alaskan salmon, which is among the species on the KidSafe "Best Choices" seafood list.

Longline



As the name suggests, a longline is composed of a mainline which may be greater than 100 kilometers in length with smaller lines suspended from it. A single long line may have well over 2000 of these smaller lines, each of which has a baited hook. As the fishing vessel moves forward, the mainline is unspooled from the sternand the baited branching lines are attached. The longline is then allowed to drift freely near the surface, or set on the bottom in some fisheries, for a pre-determined amount of time. After it has been allowed to "soak", the longline is recovered via buoys attached to the mainline and hauled back onboard. This method of fishing causes minimal habitat damage, however, is associated with high levels of bycatch. Because of the close proximity to the surface of many longlines, seabirds and turtles are common accidental captures. Swordfish and bluefin tuna are both species targeted by longlining, and should both be avoided.

Hook and Line

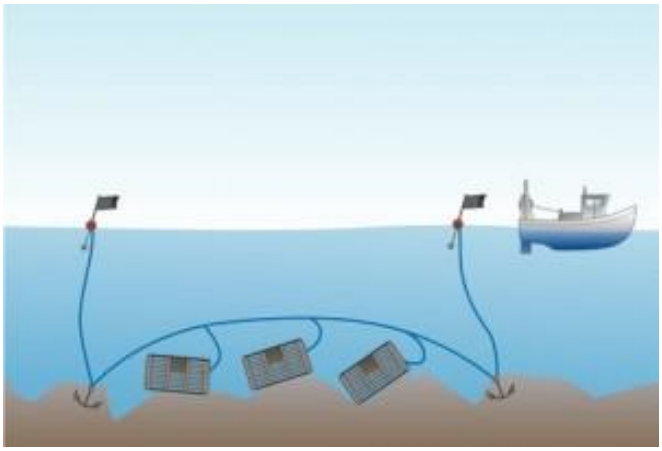


Hook and line fishing involves lowering lines with baited hooks directly from the fishing vessel. When a fish takes the bait the line is retrieved either manually or with a mechanical device and the fish is brought onboard. This method causes minimal bycatch and habitat destruction.

Harpoon

Harpoons are used to catch large fish swimming near the surface; swordfish and bluefin tuna are two species captured with this method. Once the fish is spotted and within range, a harpoon is thrown or thrust into the fish. A barbed point on the harpoon prevents it from being pulled out as the fish tries to swim away. Vessels fitted for harpoon fishing are equipped with an elevated superstructure to give a wider field of vision for the spotter and with a pulpit in the bow to facilitate the harpooner getting within range of their quarry. This method is highly selective and therefore does not result in bycatch, however, species like swordfish and bluefin tuna are high in mercury, and should accordingly be avoided.

Pots and Traps



There are many different pot and trap designs, depending on the species being targeted. They are constructed of either a metal or wood frame with wire mesh or fabric netting, and have entrances that allow fish and/or crabs, lobsters, and other species in but hinder or prevent their escape. Bait is lowered to the bottom of the trap where they are allowed to sit or "soak". After a pre-determined length of time they are located, often by an attached buoy, and pulled back onboard the fishing vessel, sometimes by hand but mostly with a mechanized winch. As the traps and pots sit on the bottom, they cause little damage to the seafloor. Bycatch associated with traps and pots is also limited

Electric fishing

These people are electric fishing along the edge of the Manawatū River. Electric fishing is a way to find out what fish species are in the water. An electric current is passed through the partially submerged rods at the front of the boat. The current temporarily stuns the fish, which float to the surface. They are scooped up in nets and identified. Boats equipped with generators, probes and "pulsators" are maneuvered slowly along the shoreline. Pulsators convert the generator's AC current to DC current which causes minimum stress to the fish. Fish that are temporarily stunned by the electrical field that extends 10 to 20-feet around the boat are captured in a dip net and transferred to live wells equipped with aerators. They completely recover within a few minutes and rarely exhibit signs of stress or injury.

Each collection period lasts 900-seconds and anywhere from 15 to 40 samples are taken throughout each reservoir. Sampling effort is equally allocated to the most abundant habitat types. Fish are quickly weighed, measured and checked for parasites and abnormalities. They are then released as close as possible to the area from where they were captured.

Electro fishing is quite simple; however, it may seem to be very complicated at the first sight. The most important is to meet all cable connections and the electro fishing device . To connect

correctly device we should install first the button of steering on landing net and to connect the high voltage cable into the landing net. The button is the common PRESS-REALEASE button this means that in moment of pressing device switches ON and makes possible fishing and in moment of releasing the button the electro fisher switches Off.

This button we install on landing net - we attach it with isolation to landing net in distances 30-50 cm from end so that we could easily operate the landing net and switch on the electrofisher. This button is connected with cables of steering input power- we press the button then the device switches ON- we release the button then device switches OFF.

High-voltage cable - (up to 1000 Volt) we can install directly to the hoop and to wind its rest on stick or what more comfortable to place into the centre of plastic telescopic tube (handle of landing net) with connector (socket) at the end of the handle. This connector allows releasing the handle of the landing net from the electrofisher itself. Then we can only connect sockets each time we start fishing to landing net or disconnect when we go home.

When we have this done we can connect cables of plus (+) and minus (-) to the battery (from UPS 10 Ah or any other) and we can start fishing dipping the landing net in water and pressing press-release button. In this moment flow of electric current follows between electrodes and executes the fishing. In the course of hunting negative (-) electrode is placed in water "freely" and positive electrode (anode)(+) serves to active fishing. Intensity of current field is the greatest at positive electrode and quickly diminishes with the distance from it. In regard with this fishes become paralyzed in the radius not greater than 2-5 metres from anode. Inertly flowing fishes we should pick up quickly because in the course of several seconds they recover equilibrium and escape at random.

When we catch wading in a river cathode cable we pull near behind so that space out between electrodes must be not greater than 2-3 metres. Similarly, in case of fishing from boat. Fishermen should also watch out not to close cathode and anode and simultaneously to switch on the device

because it may cause its overload and damage, but it should not happen in most cases as the electro-fisher has built-in protection from overloads.