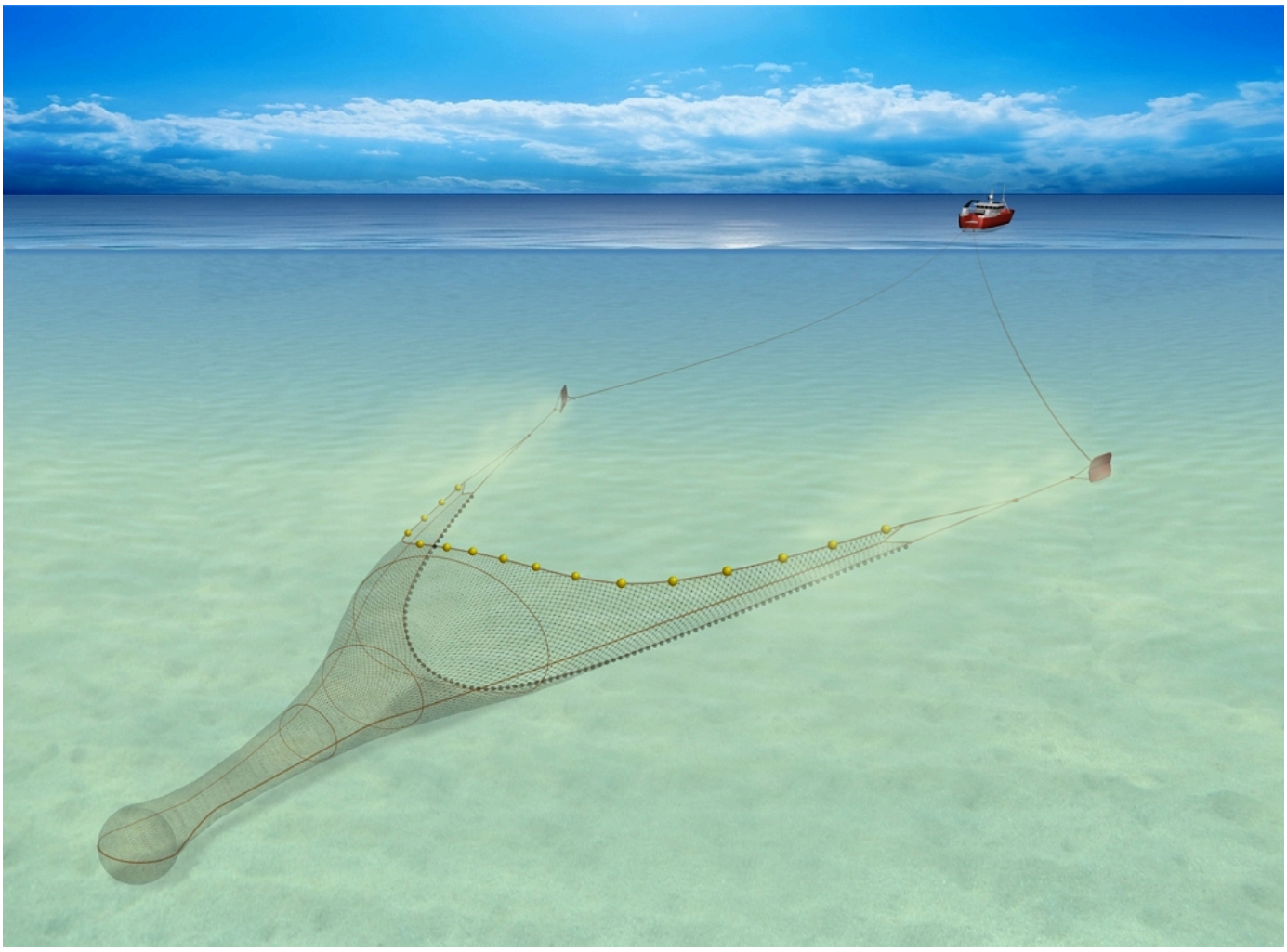
Demersal Trawl - General

Alternative names

- Bottom trawling
- Otter trawling

Summary

A demersal trawl is a cone shaped net that is towed on the seabed to target demersal fish species. The mouth of the trawl is held open by a pair of trawl doors (Otter Boards).



Demersal trawl towed on the seabed

Environmental impact

Selectivity - size selection in this gear can often be managed by cod-end mesh size or use of basic selective devices. Species selection is often managed by gear design and/or spatial and seasonal management of the fishing operation. There is a lot of criticism of demersal trawls but in general the gear is much lighter on the seabed than many realize. The fisherman has to rig the gear so that it maintains contact with the seabed but does not 'dig' in at all as this will stop the vessel and is very likely to damage the gear or even lose the gear on the seabed.

Seabed impact - As with all trawls there will be a certain degree of seabed impact with the trawl doors. When used properly the weight of any trawl door on the seabed will be much reduced compared to its weight on land. In most demersal trawl fisheries the weight of the trawl door on the seabed will be approximately 20-25% of its weight in air. This is due to several factors. One is about an 8 -10% reduction due to the weight

of steel and other materials in water. The other major factor is the tension of the gear behind the trawl door and the uplift from the warp towing the trawl door. There will be very little impact on the seabed from the sweeps and bridles or the ground gear of the trawl as this is generally very light gear when in use.

The ground gear on a demersal trawl can range from a light weight grass rope footrope to heavy rock hopper gear that enables the trawl to be towed over hard rough sea beds. Although some of these gears look heavy once they are in the water and the buoyancy (floats) of the net and the tension is on the gear much of this weight is lost and the gear is much lighter on the seabed than expected.

Other information

Demersal trawling is a direct descendant of the early beam trawl. The original form of towed fishing gear used by sailing boats with their unpredictable towing power was generally a beam trawl. The size of the gear being restricted to the length of beam that could be stowed aboard the vessel, and the limitations on available wind power. With the introduction of steam powered vessels, and later diesel propulsion, otter boards were developed to spread the nets in place of the rigid beam of the beam trawl. This allowed nets to be made much larger. To begin with, the otter boards or trawl doors, as they are more commonly called nowadays, were attached to the wing ends of the nets. Later, with the understanding that certain species of fish could be herded into the path of the net by ropes or wires on the seabed, short bridles or sweeps were added between the wing end of the net and the trawl doors, allowing a larger area of seabed to be swept by the gear.

Nowadays, the sweeps and bridles can range from none at all, right up to 300 metres, depending upon the target species and the type of seabed being fished. A basic trawl is made up from two shaped panels of netting, laced together at each side to form an elongated funnel shaped bag. This funnel tapers down to the cod-end where the fish are collected until the net is hauled. The remaining cut edges of the netting, and the mouth of the net, are strengthened by lacing them to ropes to form wings that help shepherd the fish into the mouth of the trawl. The rope along the upper edge of the net is called the head line, the one along the lower edge is termed the foot rope or fishing line, and the side ropes are called the wing lines. The head rope has floats attached to it to lift it clear of the seabed, and holds the net open in a vertical direction.

The footrope, usually has some form of weighted ground gear attached to help it to maintain contact with the seabed. The wings of the net are attached to a pair of trawl doors by wires or ropes, called bridles or sweeps. As a result of the drag of the gear, and the floats on the headline, the actual weight of a demersal trawl on the seabed will be in the region of 10 - 20% of its weight in air. The trawl doors, made of steel or wood, are designed to be towed through the water at an angle, causing them to spread away from each other, to open the net in a horizontal direction. The trawl doors, in turn, are attached to the boat by wires called trawl warps. As well as spreading the net, the trawl doors have to be heavy enough to keep the gear on the seabed as it is towed along by the trawler. As the trawl doors are towed along the seabed they kick up a sand cloud that initiates the herding of fish towards the mouth of the trawl.

The early trawl doors were flat rectangular-shaped objects made from timber, with steel reinforcing. These simple doors are still used today in some fisheries, but many boats use steel doors with the plates bent into a shape. Recently, many manufacturers of trawl doors have introduced new designs of trawl doors using curved plates, and aerofoil type sections, in an attempt to improve their hydrodynamic shape, making them more efficient at spreading the gear. The more elaborate designs tend to be more expensive, and more intricate to use well. Correct weight distribution and towing chain lengths are critical to getting a trawl door to spread the trawl gear effectively.

Gear classification

Demersal | Herding gear | Towed or dragged gear | Trawls | Mobile gear

Main target species (UK)

- Any demersal species
- Cuttlefish
- Dover Sole
- Haddock
- Monkfish
- Nephrops
- Shrimp
- Squid

Possible bycatch

- Any demersal species

Related gear

Demersal Trawl - Nephrops hopper trawl

Demersal Trawl - Nephrops trawl

Demersal Trawl - Rockhopper trawl

Demersal Trawl - Scraper net

Demersal Trawl - Sole Trawl

Related selective devices

4 Panel Cod-end

Square Mesh Cod-ends

T90 Cod-ends

Coverless Trawls

Diamond Mesh Size

Inclined Netting Grids

Box Trawl

Gear Size

Headline Height

Off Bottom Trawl

Gear Operation

Separator panels

Square Mesh Panels

Towing speed

Inclined Separator Panels

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