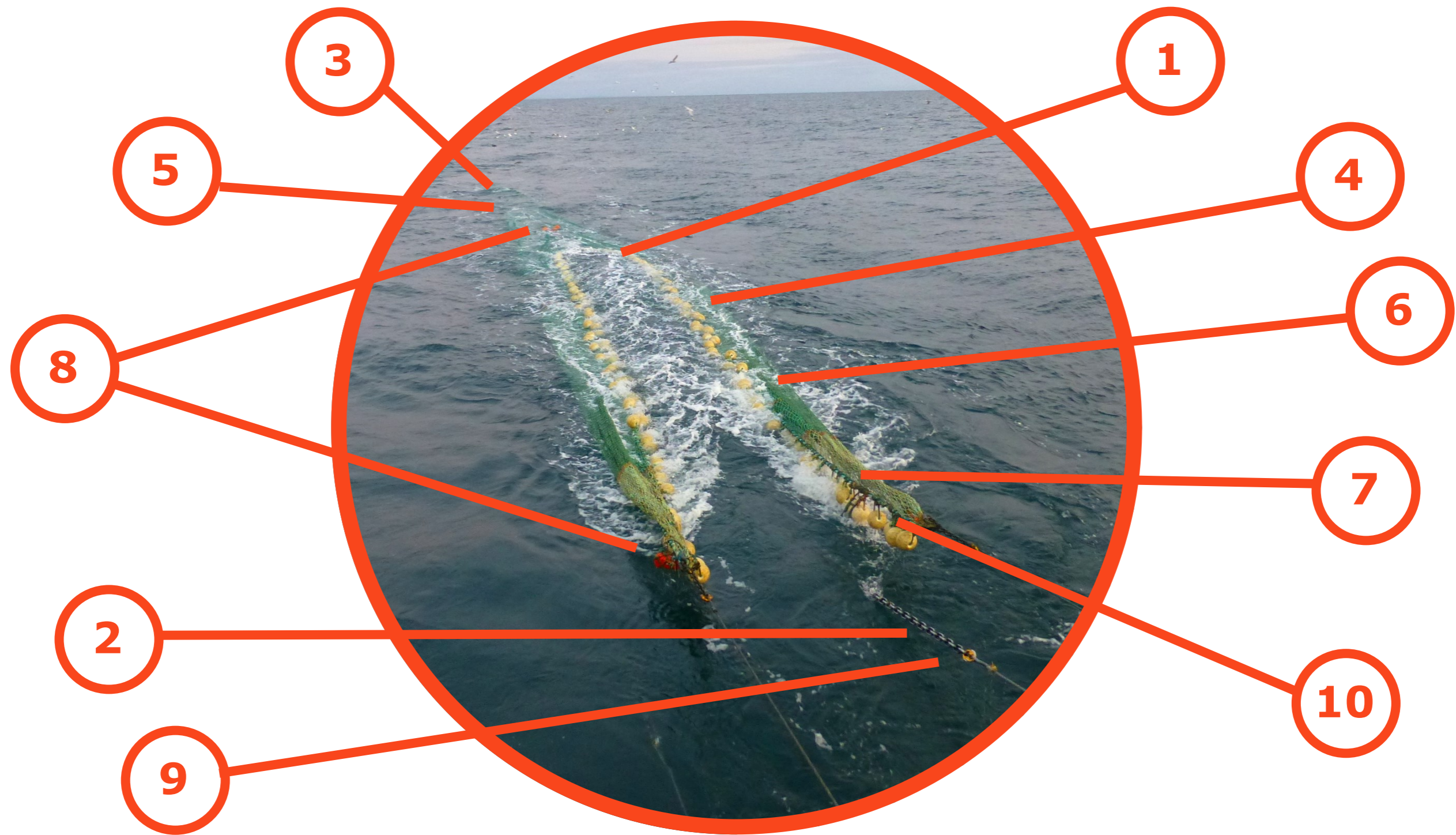


Trawling Technology

Modern trawl nets use techniques based on years of experience and experimentation plus the latest materials selected for their particular properties to create a complex, efficient structure.



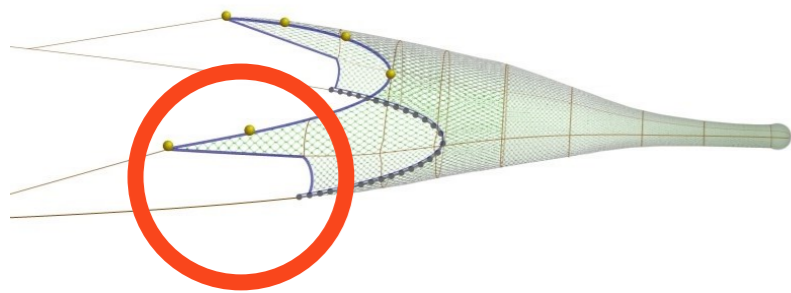
These nets are used by Marine Scotland Science in scientific trials to monitor fish numbers and distribution in Scottish waters. Trawlers use the same types of nets to catch demersal fish.

Ropes and Chains

1 Headline and Footrope

Combination rope is a braided mixture of synthetic material (polypropylene) and steel and is typically used in the construction of the frame lines such as headlines/fishing-lines and wing-lines.

The benefit of using combination rope for the frame-lines is the significant reduction in weight compared to wire of the same diameter, but still retaining sufficient strength and durability.



Cut-away lower wing



Combination rope headline and footropes

2 Mid-link Chain

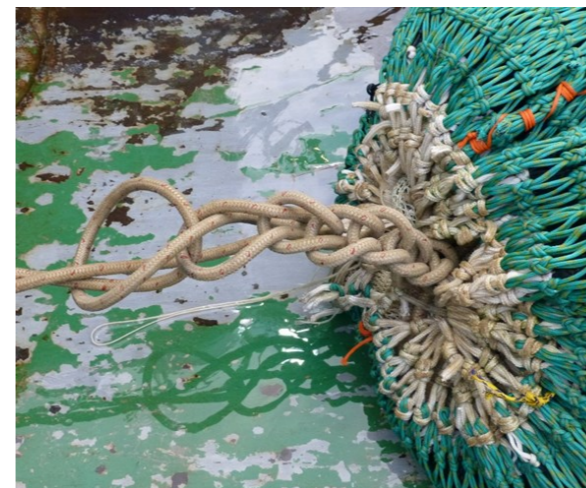
Mid-link chain used for the lower wing-line and to replace the combination in trawls with a cut-away lower wing.

A cut-away lower wing has the leading lower wing-end netting sections removed to minimise the risk of damage on rocky seabed areas.

3 Codline

A drawn rope taken through the last row of the codend meshes, where the catch of fish collects, is typically referred to as the codline.

The technique used to tie the codline is interlocking loops finished by tucking both ends or tails through the final loop. A multi plait nylon (PA) rope is always used for the codline due to its construction being extremely strong and secure when tied, but not prone to jamming up when unfastened.



Codline rope



Lestridge made with polypropylene rope

4 Lestridge (or Selvedge) Rope

Used to provide additional strength to a lestridge and typically constructed from either polyethylene (PE), polypropylene (PP), a blend of both or polyester.

The lestridge or selvedge is the seam formed by gathering together several meshes at the edges of adjacent netting panels and lacing them together.

Netting

5 200mm Diamond Mesh Netting

Made from 5mm double compact (high tenacity) braided polyethylene (PE) twine. Compact twine is extremely strong and has good resistance to abrasion but is relatively heavy and therefore more expensive.

This material is used to construct the codend and to strengthen key areas around the trawl such as wing-ends, guard meshes and tearing strips.



Tearing strip constructed from



Guard meshes around fishing line

The Codend is the end portion of the trawl and where the catch collects.

Wingends are the netting panels at the leading edge of a trawl and extending forward of the trawls main body.

Guard meshes are shallow (~6 meshes deep) sections of netting inserted around vulnerable areas of a trawl such as the fishingline, headline or lestridge. Typically guard meshes would extend the full length around the fishingline and headline.

Tearing strips are strips of netting inserted between the netting panels in the forward portion of a trawl to act as a stopper and prevent a tear running down the full length of the trawl.

6 Low Tenacity Netting

A selection of diamond mesh low tenacity polyethylene netting constructed from 3/4mm single twine. This material is used to construct the majority of netting panels around the main trawl main body.

For many trawls employed in Scotland, this netting is replaced by a medium tenacity type of twine.



Trawl being hauled aboard RV Scotia – shows different netting panels



Codend being lifted aboard made from Medium tenacity twine

7 Medium Tenacity Netting

Medium tenacity double polyethylene twine used for codends and to strengthen key areas around the trawl. It has better strength and resistance to abrasion than low tenacity netting but is not as heavy as compact twine.

As with all synthetic materials, the environmental benefits of having durable, lighter gear has to be weighed against the negative impacts of micro-plastic pollution.

Fittings

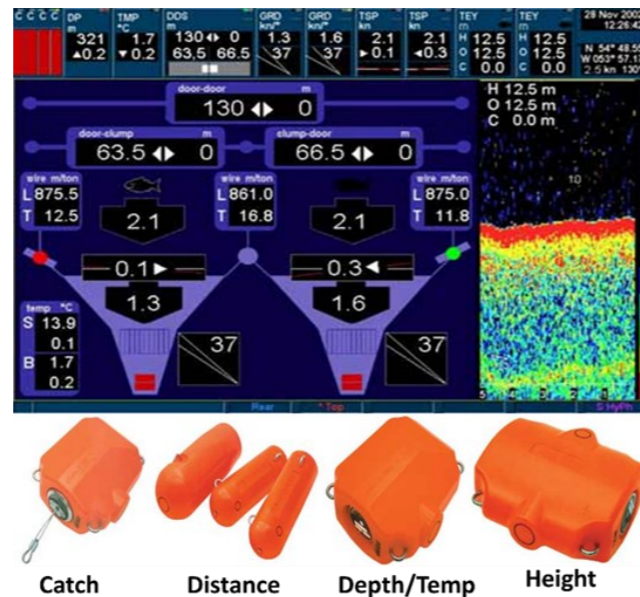
8 Scanmar Sensors

Sensor set measuring distance using wireless transmission technology and used to measure trawl door and wing-end spread of the trawl.

The distance is derived from the time a ping from the master (larger) sensor is returned by the slave (smaller) sensor and then this is transmitted by the master to the hydrophone located on the vessel's hull and displayed on a screen in the wheelhouse.



Scanmar distance sensor in its bracket on the starboard trawl door



9 Clip

Fastens the chain to the long wire warps that haul the trawl.

10 Float

An 8 inch (200mm) plastic trawl float rated to 1200m (max) and attached to the upper edge of the trawl mouth (headline) to provide vertical (static) lift.

11 Rockhopper Disc and Spacer

Moulded rubber or recycled industrial conveyor belts and discarded tyres are used to construct rockhopper ground gear. This holds the bottom of the trawl mouth in ground contact whilst giving some protection for the netting against snagging by holding the fishingline clear of the seabed.

Strung onto suitable chain or wire, this style of ground gear is currently the most common used by Scottish demersal whitefish and to some extent, Nephrops trawl fleets.



Trawl net top drum



350mm rockhopper gear with belt spacers in between each disc

12 Plastic Net Needle

Although twine is technologically complex and netting is manufactured by machines and purchased by the bale, the needle is still the only method of converting netting bales into the finished trawl. It remains similar in design to those used generations ago. The final shape of the net, critical to catching only the target species, is still created by hand.