

Appendix H

FISHING GEARS

H.1 There are two broad categories of fishing gear: mobile and static. Mobile gears are actively towed by the fishing vessel and include various types of trawls, nets and dredges. Static gears include nets, traps and pots. In general, static gears are more environmentally friendly, causing less incidental damage to habitats and to the seabed. Static gears may be associated with unwanted catches of non-target species, but this is less of a problem than with mobile gears, which tend to be less selective.

MOBILE GEARS

DEMERSAL FISHERIES

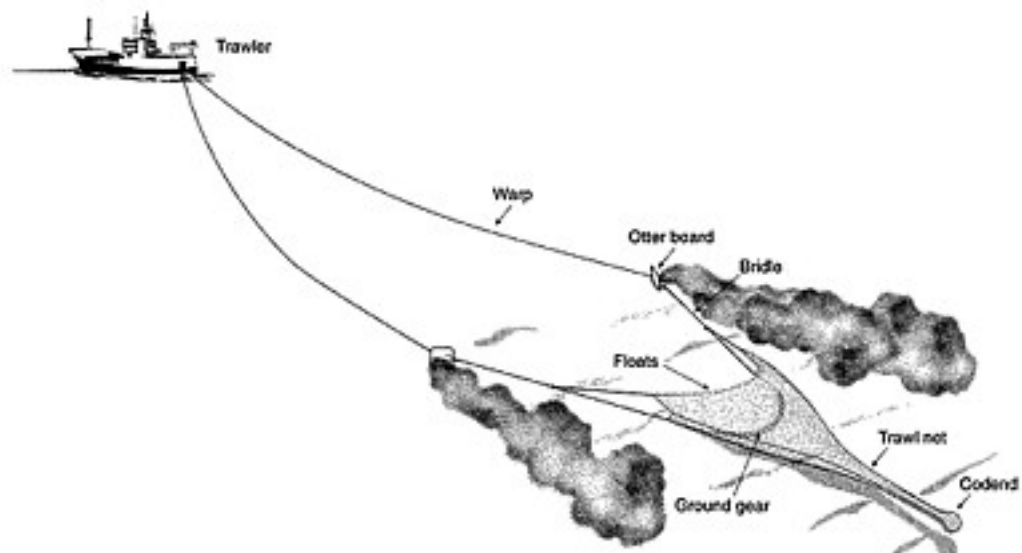
Trawling

H.2 Demersal trawling is the most widely used fishing technique in UK waters. A large, bag-like net is towed behind a vessel. The net is wide at the mouth but narrows to create a 'codend'. It is held open by the force of water against 'otter boards' made of wood or steel, which move upright through the water. Each otter board can weigh as much as 6 tonnes. The net is attached to the otter board by a weighted bridle that connects to a footrope on the bottom and a buoyed head rope to hold the net mouth open. Two vessels may tow one net between them, known as pair trawling.

H.3 A single trawl is shown in figure H-I. The heavy otter boards can plough furrows measuring from 0.2–2 m wide by 30 cm deep.¹ The design requires the speed of trawling to be moderated in order for the gear to function properly. Some have special 'rock hopper' gear enabling them to trawl over rough terrain.

Figure H-I

Demersal trawling: single rig with otter boards²

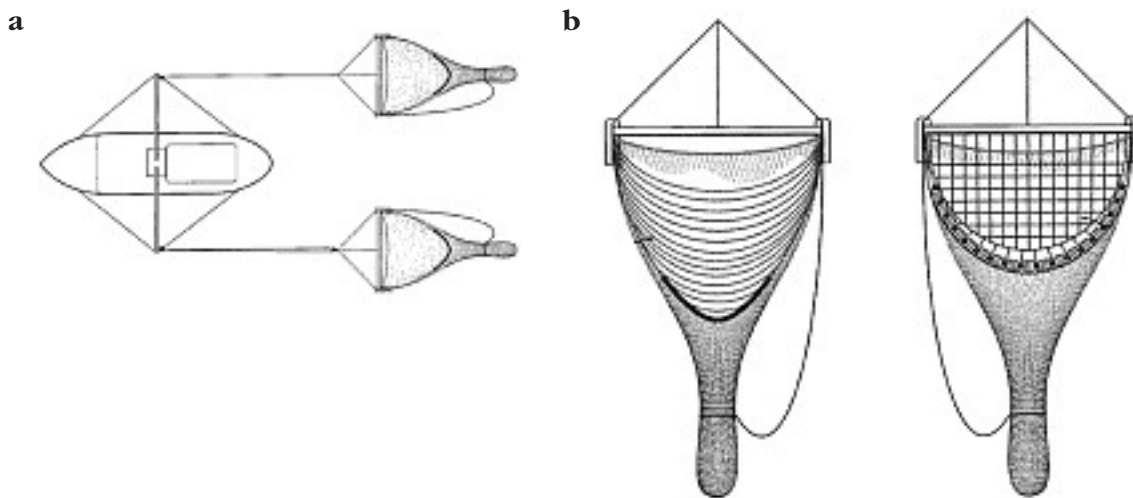


Beam trawling

H.4 In this type of trawling, the net is kept open by metal or wooden beams (figure H-II). These have shoes attached at each end, allowing the gear to be towed through the water at any speed. Various types of 'tickler chains' or a chain matrix are added to the shoes to disturb the seabed and dig out target species. Most boats use two gears simultaneously, one on either side of the boat and the largest trawlers fish at speeds of seven knots. Beam trawling is mainly undertaken in the North Sea, Irish Sea, and English Channel and off south-west England, primarily targeting flatfish.

Figure H-II³

(a) Twin beam trawling; (b) a beam trawl with tickler chains (left) and chain matrix (right)



H.5 Deep sea fisheries have developed comparatively recently. Fishing has moved from over-exploited and highly regulated fisheries on the continental shelf to areas that were largely unfished and, until recently, mainly unregulated.

H.6 Improved vessel design, gear technology, skipper ability and marketing have assisted this expansion. Some trawl fisheries target single species and have relatively small by-catches (e.g. fisheries for greater argentine and fisheries directed at spawning aggregations of blue ling and orange roughy). Other trawl fisheries are mixed-species fisheries with targeted species changing according to season and fishing depth.

PELAGIC FISHERIES

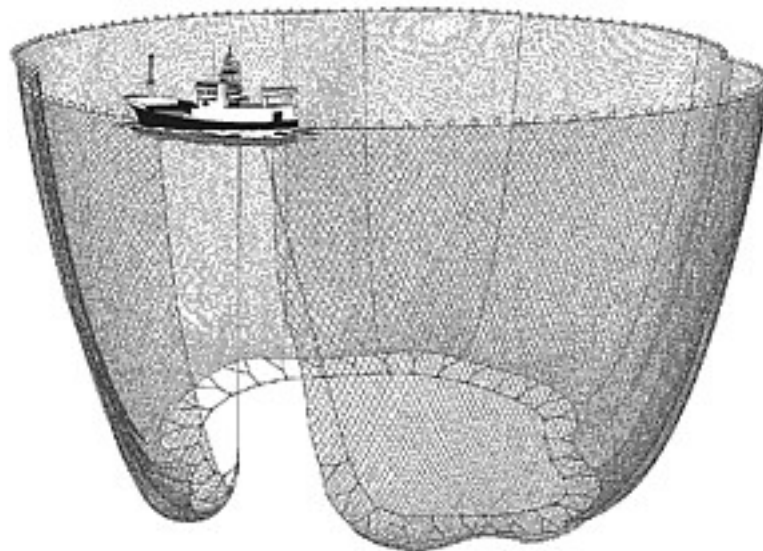
H.7 Purse-seining and pelagic trawling are used to catch most mid-water species in northern Europe, although some minor pelagic fisheries use floating gillnets, floating longlines or pole and lines. Pelagic trawlers and purse-seiners dominate the European Union pelagic fisheries.

Purse-seining

H.8 Purse-seine nets (figure H-III) can be extremely large (some so large they are measured in miles) and capture entire schools of fish. They are normally used for pelagic species such as anchovies, tuna and mackerel. The 'purse' is the mechanism under the net that closes it after the fish have been encircled. The method is so efficient that the catches are usually too heavy to drag on board and are normally pumped on. This gear can be operated with two boats per net. The main boat remains stationary while a much smaller boat encircles the fish with a long net that has floats on top.

Figure H-III

Purse-seining⁴



Longlining

H.9 A longline consists of a long stationary line to which shorter lines with baited hooks (as many as 12,000 per line) are attached. They are typically left in place for periods ranging from several hours to several days. Configuration of the lines, including the addition of floats or weights, can be tailored to different target species and habitats. Longliners fish around the entire UK coastline and mainly target cod, shark, ling, turbot and conger eel. Bottom longlines are used to catch benthic species, with weights added to the lines which allow them to rest on or slightly above the seabed. The lines are marked with buoys on the sea surface. Pelagic longlines are used to catch large species such as tuna and swordfish (but not in UK waters). They are free-floating, supported by large floats, and can be many miles long. They can be set at depths as great as 360 m.

SHELLFISH FISHERIES

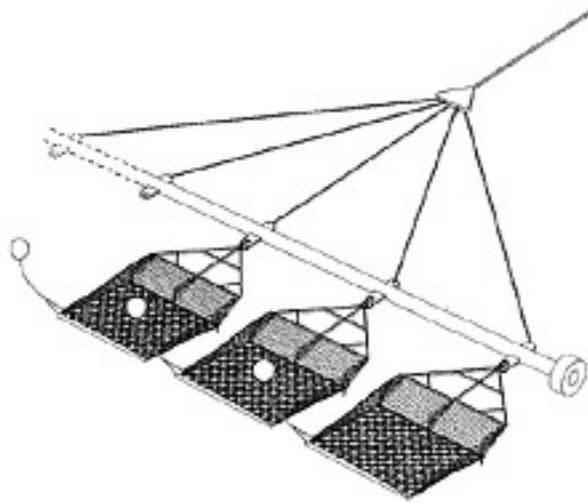
H.10 Shellfish fisheries catch a range of demersal species all around the UK, including prawn, lobsters, crabs, scallops, shrimps, whelks, mussels, oysters and cockles. The shellfish sector uses a variety of mobile and static fishing techniques, including traps, dredges, trawls and beam trawls.

Dredges

H.11 Dredges are towed behind a vessel and can be up to 4.5-5 metres wide and weigh as much as 1 tonne. The dredge commonly consists of a large metal frame with metal bags to hold the catch (figure H-IV). The frame and cutting bar ride along the surface of the seabed, occasionally digging into the bottom, while the bag drags along behind, in contact with the sea floor. The front of the frame is outfitted with a tickler chain, which triggers organisms such as scallops to propel from the seabed so they are more easily captured. Rock chains are used on rocky areas of seafloor to prevent large boulders from entering the bag.

Figure H-IV

Shellfish dredging gear⁵



Suction dredging

H.12 Suction dredging works by blasting shellfish out of the sediment with a jet of water and sucking them to the surface through a hose. The size and type of the suction heads vary and can be either self-propelled or hand-operated. This gear is used in shallow water, often in estuaries and can affect sensitive habitats. It can be a very efficient method for collecting shellfish and regulation is usually needed to prevent over-harvesting.⁶

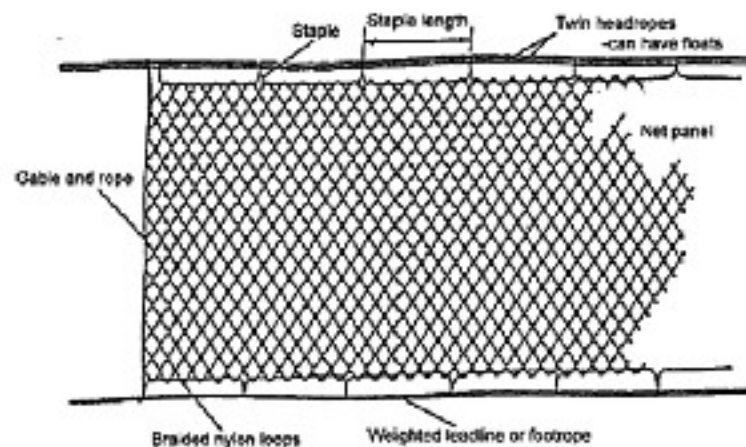
STATIC GEARS

GILLNETS

H.13 A gillnet is a curtain-like panel of netting that is suspended vertically in the water by floats along the top of the net and weighted along the bottom (figure H-V). Because the monofilament line used to make the net is transparent, organisms are unable to see the net, and swim into it and become entangled, often by their gill cover. Two main types of gillnets are in use: bottom gillnets and mid-water gillnets. An individual bottom gillnet can be 100 metres long. Mid-water gillnets can be as much as 360 metres long and 3.5–13 metres deep. In both cases, many net panels can be tied together to stretch for several kilometres. Gillnet fleets operate in the North Sea, Irish Sea, the English Channel and off south-west England and target cod, hake, sole and monkfish.

Figure H-V

Gillnet⁷



POTS AND TRAPS

H.14 Pots and traps are used to catch whelks, prawns, crabs and lobster. Baited pots are left in place for up to several days. Many pots can be connected by a common line, and can be set on the floor at a variety of depths, from very shallow to hundreds of metres.

ONSHORE COLLECTING

H.15 Shellfish, particularly cockles, can also be picked by hand on the beach. These operations range from small individual efforts to larger-scale enterprises. Sea Fishery Committees issue licences for such activities but these do not impose controls on the amounts of shellfish collected.⁸

REFERENCES

- 1 Caddy (1973); quoted in Pew report on ecological effects
- 2 Diagrams from CEFAS (2003).
- 3 Diagram from: Scottish Executive website at
www.scotland.gov.uk/library3/fisheries/fig00-03.asp
- 4 CEFAS (2003).
- 5 CEFAS (2003).
- 6 Information from Joint Nature Conservation Committee (JNCC) website at:
http://www.jncc.gov.uk/marine/fisheries/background_fisheries/active.htm
- 7 CEFAS (2003).
- 8 Evidence from representative of North West Sea Fisheries Committee, March 2004.