

TRAWLERS

A trawler is a vessel that drags a funnel-shaped net through water to harvest fish or shrimp. The net is wide at the mouth and tapers back to a narrow cod end that collects the catch. The average bottom trawl opening is 40 to 60 feet wide and 8 to 10 feet tall. Bottom trawlers usually tow their nets at 1 to 2 knots on or above the ocean floor. Fishermen might tow midwater trawls faster to catch faster-swimming schooling fish.

Trawlers have a large metal trawl door that is attached to each side, or wing, on the front of the net. The water hits the doors and the pressure of the water passing over the door spreads the net open. The doors are flat, oval, or slightly v-shaped. A steel cable extends from the door to a winch just behind the pilot house.

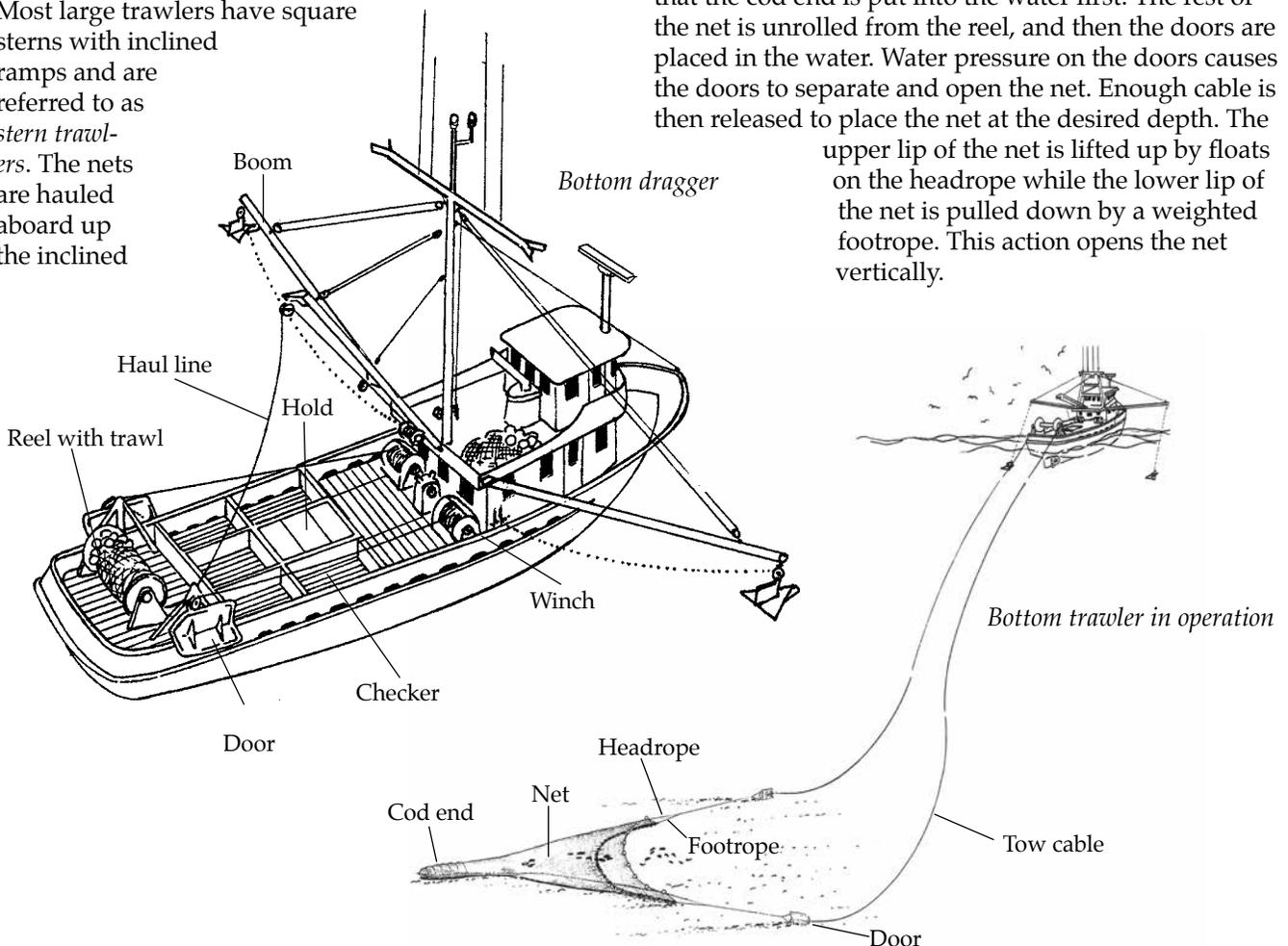
Most large trawlers have square sterns with inclined ramps and are referred to as *stern trawlers*. The nets are hauled aboard up the inclined

ramp on the stern. Older trawlers without inclined ramps haul their nets over the sides using a haul line and a block on an overhead boom to bring in the cod end of the net.

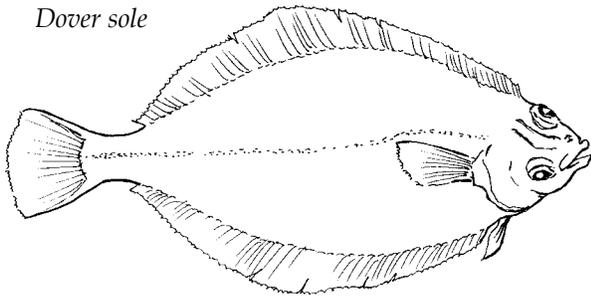
BOTTOM TRAWLERS

Bottom trawlers tow the net along the ocean floor to catch fish that live on or just off the bottom. These fish include rockfish, cod, sablefish (black cod), ocean perch, flounder, and sole. Trawls can be designed to catch particular groups of fish. A large mesh net (4 1/2 inches to 5 inches) is kept on a stern-mounted reel. The two doors are stored along the rails near the reel.

The net is set off the stern by unwinding the reel so that the cod end is put into the water first. The rest of the net is unrolled from the reel, and then the doors are placed in the water. Water pressure on the doors causes the doors to separate and open the net. Enough cable is then released to place the net at the desired depth. The upper lip of the net is lifted up by floats on the headrope while the lower lip of the net is pulled down by a weighted footrope. This action opens the net vertically.



Dover sole



Rubber discs may be attached to the net to hold it down. There are now restrictions on the size of the rubber discs that can be used on footropes when trawling on the Oregon continental shelf. These restrictions confine trawling to mostly smooth bottoms, such as sand and mud. Tow times can last from 30 minutes to several hours. Depths can range from 5 to 700 fathoms (a fathom equals six feet). Bottom trawlers typically fish from 1 to 40 miles offshore.

The crew hauls in the net by winching in the cables until the doors are back in place and most of the net is on the reel. Once the catch is on board, the net is reset for another tow. Then the fish are separated into deck bins (*checkers*) and put in the hold, where they are iced or refrigerated. It is not unusual to have up to 15 tons of fish in the hold.

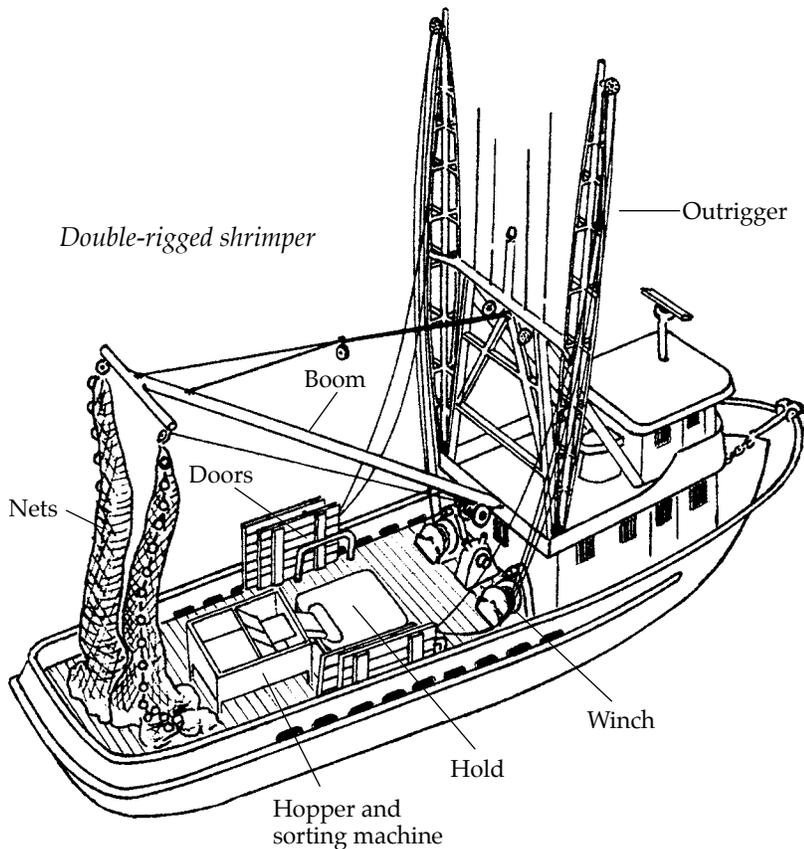
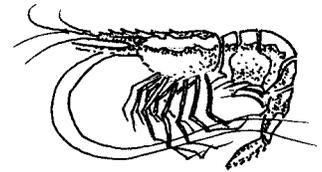
SHRIMPERS

Pacific pink shrimp are smaller than gulf shrimp and are sometimes called popcorn or cocktail shrimp or, mistakenly, bay shrimp. They have a three- to four-year life cycle. Shrimp live at depths of 40 to 150 fathoms in green or gray mud.

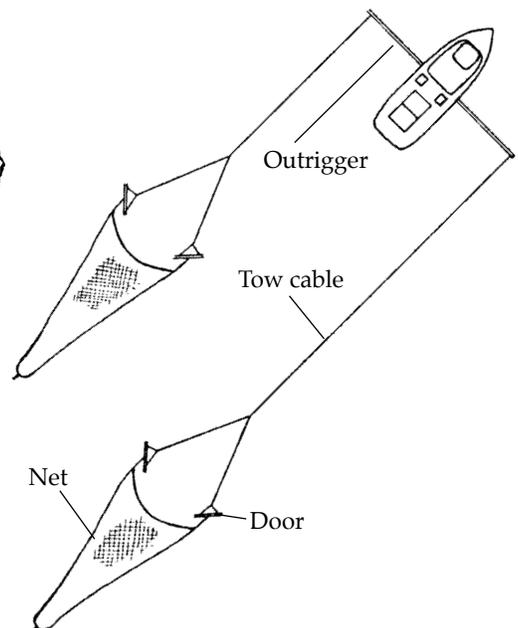
Shrimpers, who fish from April 1 through October 31, tow one or two small-meshed (1 1/2-inch) nets just above the ocean floor for small, pink cocktail shrimp. Single-rigged shrimpers tow one net off the stern,

like bottom draggers, and store the net on a stern-mounted reel. Double-rigged shrimpers tow one net off each side of the vessel. Large outriggers are lowered to a 60-degree angle to let the nets out. The nets are either kept on a reel or folded on deck. In port, they might be hung from the boom. Double riggers have a set of doors for each net. The nets also have chains (*tickler chains*) attached to the footrope. These chains drag along the muddy bottom, stirring the shrimp up off the bottom and into the net.

Pacific pink shrimp



Double-rigged shrimper in operation





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Writers: Ginny Goblirsch and Steve Theberge
Artist: Herb Goblirsch
Editor: Sandy Ridlington
Design: Rick Cooper
Layout: Sandy Ridlington
Consultant: Scott McMullen



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On board, the shrimp are emptied from the net onto a shallow sorting table or dumped into a temporary storage hopper and then sorted mechanically. Small fish are removed as the shrimp is conveyed to the fish hold, where they are packed in ice. Pacific shrimp are processed onshore through a cooking and peeling process and then shipped fresh or frozen in a process called *individually quick frozen*, or IQF. The sorting tray or machine and small mesh distinguish a shrimper from a bottom dragger or midwater trawler. Double riggers have large outriggers and two sets of doors.

MIDWATER TRAWLERS

Midwater trawlers tow a net off the stern from just above the bottom to just below the surface. They harvest fish traveling in schools, such as Pacific whiting. The fishermen use electronic equipment to find and stay with the fish. The net is trawled a shorter time (10 to 30 minutes) than shrimp or bottom trawlers. One tow may yield 50 tons of fish.

Midwater trawlers are rigged like bottom trawlers but use tall, concave, metal doors and frequently have more than one net reel on board. An overhead A-frame, or *gantry*, on the stern holds one or two reels. There may even be a third reel near the pilot house.

MANAGEMENT

Shrimp catches vary according to oceanographic conditions. The local shrimp fishery is one of the cleanest shrimp fisheries in the world, with catch being almost entirely pink shrimp. Fishermen now use bycatch reduction devices to virtually eliminate the bycatch of rockfish and halibut.

When it comes to groundfish, managers have steadily tightened the allowable quotas to protect the species. The fishery is further managed with limited entry permits, area closures, and gear restrictions.

Midwater trawler

