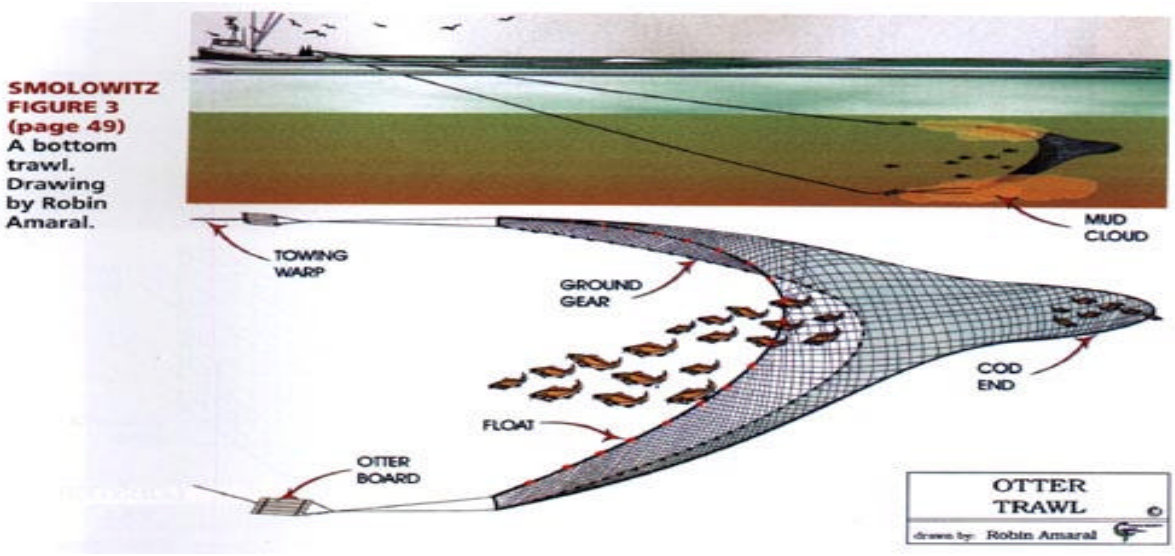
What is a Bottom Trawl?

Bottom trawls are a type of mobile fishing gear consisting of very large nets that are dragged on the seafloor to catch groundfish and other species. Bottom trawls are used in virtually all East Coast, West Coast and Alaska fisheries to catch shrimp and fish such as cod, flounder and rockfish. Trawls are used from shallow, inshore depths of 50-feet to extreme depths of 6,000-feet on the continental slope. The National Academy of Sciences found in its 2002 report, "Effects of Trawling and Dredging on Seafloor Habitats," that U.S. trawlers have damaged over 230,000 square nautical miles of seafloor, an area greater than California.

The most common type of bottom trawl in the United States is the **otter trawl**, in which the net is held open vertically by the force of water moving against two massive **otter doors/boards**. The trawl net can stretch 40-feet in height and spread over 200 feet wide between the doors, depending on factors such as the depth fished and the type of fish targeted. A large, fully-rigged net weighs well over a ton and requires a large, powerful boat to drag the net, particularly when loaded with a



catch of hundreds or thousands of pounds of fish and bycatch (unwanted, non-target species) in the **codend**, or back of the net. The impact to the seafloor from trawling is a compound of the weight of the net and the forward momentum of the gear as it is dragged forward.

The opening of a bottom trawl net is lined with **floats** on the headrope and with weighted **ground gear** on the **footrope**. The type and size of gear attached to the heavy, steel cable footrope vary according to the complexity of the habitat on which the trawl is dragged. The ground gear ranges from small steel or rubber **rollers** (or **cookies**), used on flat sand and mud, to very large molded rubber rollers and **rockhoppers,** used to gain access to structurally complex habitat such as boulder fields, deep sea coral reefs or rocky pinnacles and outcrops. Rollers may also be attached to the **bridles**, the steel cables connecting the net to the otter doors. The rollers or rockhoppers attached to the footrope and bridle allow the net to maneuver over structural seafloor obstacles and help to ensure that the footrope maintains constant contact with the seafloor. On relatively smooth seafloor, **tickler chains** may be added to the footrope to disturb the sea floor and to frighten fish

up from the shelter of the bottom and into the net. The entire apparatus of chain and footrope attachments is termed the **sweep**.

Roller and Rockhopper Gear

Bottom trawls were historically dragged on relatively smooth bottoms in shallow water to catch fish such as flounder and haddock. As those fish stocks declined, trawlers began to use rockhopper gear and other technological innovations to fish in deeper water and to access areas with structurally complex habitats such as deep sea coral forests, rock pinnacles, and boulder fields. Until the mid-1980s, trawls could not be used in these high-relief habitats without risking expensive damage to the net from snagging on and rubbing against the rough bottom. In the past 20 years, however, rollers and rockhoppers have gained popularity among the U.S. fishing fleet as a way to fish these structurally complex habitats that had previously been *de facto* refuges from trawls. The rollers and rockhoppers predominately used in the U.S. range from 4-inches to over 30-inches in diameter depending on the size of the obstructions over which the trawl is dragged. Large rollers and rockhoppers are molded from steel or highly compacted tire panels and can weigh several hundred pounds each. While roller gear is able to rotate on the footrope, rockhopper gear is held fast by two or three parallel chains, dragging and bouncing rather than rolling along the bottom. Using large rollers or rockhoppers, fishing vessels are now able to trawl in structurally complex habitats with a reduced probability of gear damage or loss, though with much greater destruction of important fish habitat and bottom-dwelling species.

Inadequate Restrictions on the Use of Bottom Trawls

While dragging bottom trawls through any habitat has an impact, worldwide scientific consensus is that bottom trawls cause the most damage in high-relief, structurally complex habitat. Indeed, the President's Ocean Action Plan of 2004 'encourages all regional fishery management councils to take action, where appropriate, to protect deep-sea corals when developing and implementing regional fishery management plans.' State and federal fishery managers have started to take heed: all 18 coastal states with complex habitat and 5 of the 8 federal fishery management councils have enacted some limitations on the size of roller or rockhopper gear or, occasionally, have banned all bottom trawling. Although these regulations are a promising start, they are not comprehensive and do not protect all complex habitat areas. Several councils have yet to permanently ban damaging gear in sensitive habitats. Furthermore, among those councils that do restrict bottom trawling, many still allow the use of rollers and rockhoppers of a destructive diameter while others restrict bottom trawling only at particular times of year or in some fisheries. These partial restrictions are insufficient because they leave complex habitat vulnerable to bottom trawling for other fish species or at other times of year.