NATIONAL MARINE SANCTUARIES ™

BOTTOM TRAWLING EFFECTS ON BENTHIC HABITATS

Action Plan Summary

MONTEREY BAY NATIONAL MARINE SANCTUARY

THE ISSUE:

Based on numerous scientific studies, the fishing technique of bottom trawling is widely believed to adversely impact benthic, or seafloor, habitats. By identifying the scope and severity of bottom trawling within the Monterey Bay National Marine Sanctuary (MBNMS), we will be able to determine the need for protective actions and identify solutions to potential problems.

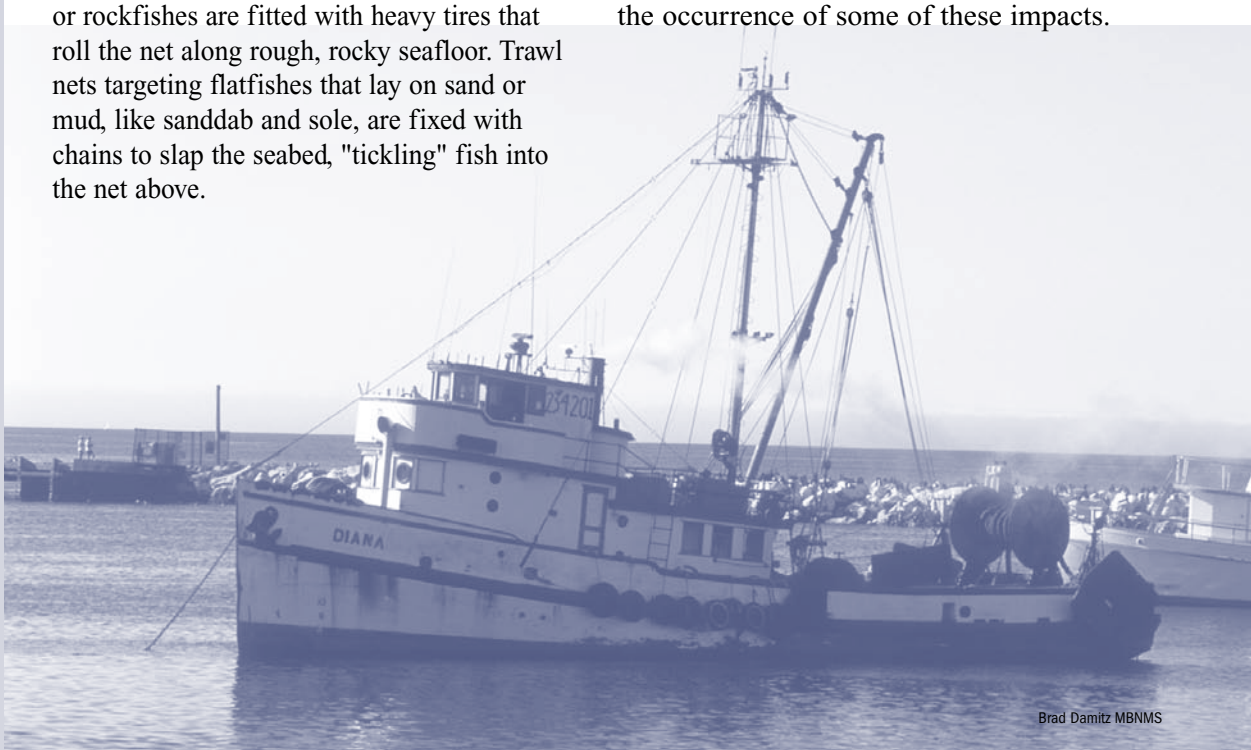
OUR GOAL

The sanctuary's goal is to protect the integrity of biological seafloor communities within the MBNMS by evaluating and minimizing the adverse effects of bottom trawling, while facilitating the long-term continuation of sustainable fisheries.

BACKGROUND INFORMATION

Trawl nets are one of five primary types of gear used by commercial fishermen in the sanctuary. Trawling involves dragging a cone-shaped net behind a boat to catch fish in the **midwater** (**pelagic** trawling) or along the seafloor (bottom trawling or "dragging"). The most common trawl net used in the sanctuary is a bottom trawl. Bottom trawlers drag their large, heavily weighted nets across the seafloor to catch groundfish, or, bottom-dwelling fish. Different trawl set-ups are employed depending upon the species being targeted. For example, rockhopper trawls targeting lingcod or rockfishes are fitted with heavy tires that roll the net along rough, rocky seafloor. Trawl nets targeting flatfishes that lay on sand or mud, like sanddab and sole, are fixed with chains to slap the seabed, "tickling" fish into the net above.

Based on many scientific studies, bottom trawling is widely believed to harm the seafloor. By directly disturbing or damaging the seafloor, trawling causes a loss or alteration of this important habitat. In addition, it affects biological diversity by removing the targeted species, as well as killing non-targeted species (unwanted or unintentional catch known as bycatch). This may in turn affect predators, prey, and overall interactions of the seafloor community. A scientific study conducted in the sanctuary in 1998 indicated the occurrence of some of these impacts.



Brad Damitz MBNMS

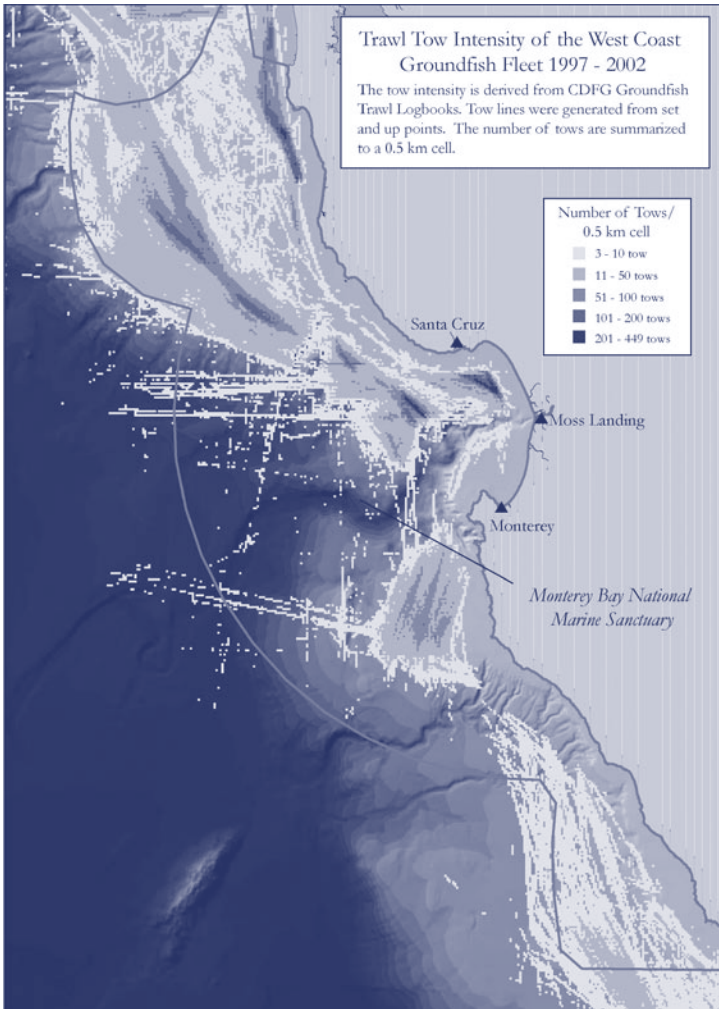
The ocean floor is often mistakenly envisioned as a nearly lifeless plain. However, seafloor features, such as rocky reefs, crevices, seaweeds, and numerous invertebrates like corals, sponges, and anemones create habitat complexity and diversity. Many kinds of fish and animals need this diverse seafloor habitat to survive — as a place to hide, feed, and breed. Scallops and clams burrow into the sandy seafloor, while flatfish, like sole and halibut, hide on sand and gravel. Rockfish take shelter in rocky reefs among delicate underwater communities of sea fans, tubeworms, and anemones. The complex features of the living seafloor are important refuges from predators and feeding places for these bottom dwelling species.

A greater complexity of seafloor habitat correlates with a higher diversity of species and survivorship of many commercially important fishes. Yet bottom trawling damages the living seafloor by scouring, crushing, burying, or exposing marine animals and their habitats, and greatly reduces the complexity of the seafloor. This harms both fishes and **invertebrates,** whose early life stages depend on the diverse seafloor habitat. Young fish are left vulnerable to predation, which may ultimately reduce fish populations ifjuveniles do not survive. Many studies show the diversity of life in heavily trawled areas plummets, particularly in areas where complex seafloor habitats normally exist.

Once the living seafloor is damaged, it can take centuries to grow back. Recovery after disturbance is often slow because recruitment of new species is sporadic and growth to maturity takes years – decades or more for some structure-forming species. In some cases, the seafloor may be permanently destroyed, if trawled continually and frequently. Trawling may also cause clouds of sediment to rise into the water column, which can affect processes that depend on water clarity, from photosynthesis to feeding by fishes and invertebrates.

Increased efforts by fishermen to find unexploited fish populations in more remote and lightly fished areas is also a concern. Recent advances in fishing technology (e.g., rockhopper gear, global positioning systems, fish finders) are eliminating what were de facto refuges from trawling, and may expose new regions of the continental shelf, slope, submarine canyons, and seamounts to the effects of bottom trawling.

Concern over the destructiveness of bottom trawling is not new. Even in 12th century England, British fishermen petitioned against bottom trawling, then done under sail, because of the damage the nets did to fish and the ocean floor. Currently, global concern about the impacts of bottom trawling is rising. Scientists, conservation groups, and some commercial fishermen are increasingly concerned that bottom trawling negatively affects the health of the ocean and other fisheries. In early 2004, 1,136 scientists from 69 countries signed a proclamation calling for the protection of deep-sea corals, particularly from bottom trawling.

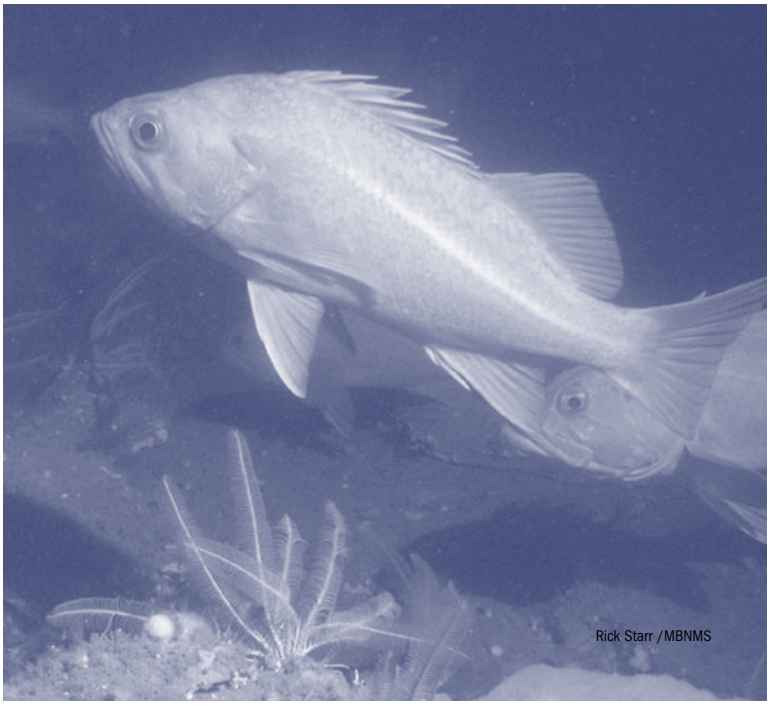


THE SANCTUARY'S ACTION PLAN

The sanctuary's "Bottom Trawling Effects on Benthic Habitats" action plan was developed jointly with a working group comprised of a variety of stakeholders, and includes:

- Forming partnerships with fishermen to identify the impacts of bottom trawling and find workable solutions to protect sea-floor habitats
- Assessing existing trawl activity
- Identifying habitats most vulnerable to trawling
- Developing a system to identify and understand existing trawling regulations and restrictions.
- Utilizing scientific research to clearly identify the specific impacts of trawling to seafloor habitats
- Developing appropriate management recommendations and measures to mitigate the adverse effects of trawling
- Developing a program to educate the public about the impacts of bottom trawling, and facilitate communication and information exchange among resource managers, researchers, and fishermen

If the need for new regulatory measures is identified, they will be presented to the relevant fishery management agencies for implementation.



Bottom-dwelling fish like this canary rockfish are caught in trawl nets that are dragged along the seafloor.

For a complete listing of the sanctuary's "Bottom Trawling Effects on Benthic Habitats Action Plan" please visit http://sanctuaries.nos.noaa.gov/jointplan/m_reptoad.html and scroll down the page.

GLOSSARY

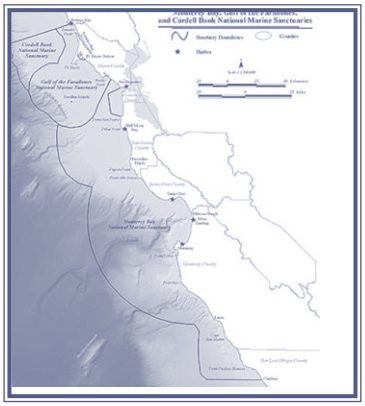
Bottom Trawling:
The fishing practice of dragging a large, weighted cone-shaped net to catch fish along the seafloor.

Invertebrate:
Animals that do not have a backbone.

Midwater:
The open ocean environment from a depth of approximately 650 feet (200 meters) to 3,000 feet (1,000 meters).

Pelagic:
The open ocean environment; the part of the ocean located away from shore.

The Joint Management Plan Review (JMPR)

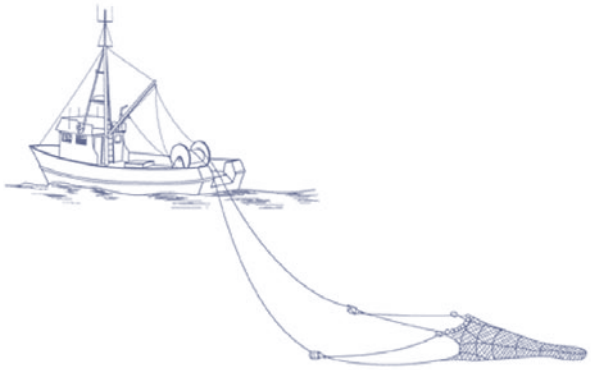


"Bottom Trawling Effects on Benthic Habitats" is one of the action plans in the MBNMS Draft Management Plan. The MBNMS Draft Management Plan includes twenty-eight plans that, once finalized, will guide sanctuary management for the next five years. The plan is a revision of the original management plan, adopted with sanctuary designation in 1992, and is focused on how to best understand and protect the sanctuary's resources.

The National Marine Sanctuary Program (NMSP) is updating the management plans for the Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries a process known as the Joint Management Plan Review (JMPR).

How You Can Get Involved in the MBNMS Management Plan Process

The MBNMS welcomes your ideas about important resource management issues in the sanctuary. A Draft Management Plan and Draft Environmental Impact Statement are scheduled for release to the public in 2006. Following their release, hearings will be held in several locations throughout the region to gather public comment. Written comments will be accepted as well. To find out about public hearings, or how to submit written comments, please visit our website at http://www.sanctuaries.nos.noaa.gov/jointplan.



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Resources

Alaska Marine Conservation Council: ***Bottom Trawling***
http://www.akmarine.org/ourwork/fact-trawl.shtml
Marine Conservation Biology Institute: *Seafloor Destruction by Roller and Rockhopper Bottom Trawl Gear*
http://www.mcbi.org/destructive/Trawl_Impacts.pdf
Monterey Bay National Marine Sanctuary http://montereybay.noaa.gov
National Marine Fisheries Service Office of Habitat Conservation: ***A Review of National and International Literature on the Effects of Fishing on Benthic Habitats*** http://www.nmfs.noaa.gov/habitat/habitatprotection/pdf/KJohnson.pdf
National Research Council: ***Effects of Trawling and Dredging on Seafloor Habitat,*** National Academy Press, Washington D.C., 2002. http://search.nap.edu/books/0309083400/html
Sanctuary Integrated Monitoring Network (SIMoN) http://www.mbnms-simon.org
World Conservation Union: ***1,000 Scientists Urge Halt To Deep-Sea Bottom Trawling***
http://www.iucn.org/news/cbd04/160204afp.pdf

THE MONTEREY BAY NATIONAL MARINE SANCTUARY

Stretching from Marin to Cambria, the Monterey Bay National Marine Sanctuary encompasses 276 miles of shoreline and 5,322 square miles (4,625 nautical miles) of ocean, extending an average distance of 30 miles from shore. At its deepest point, the sanctuary reaches down 10,663 feet (more than two miles). The sanctuary was established for the purposes of resource protection, research, education, and public use. Its natural resources include one of our nation's largest kelp forests and one of North America's largest underwater canyons. It is home to one of the most diverse marine ecosystems in the world, including 33 marine mammal species, 94 seabird species, 345 fish species, and numerous invertebrates and plants. This remarkably productive marine environment is fringed by spectacular coastal scenery, including sandy beaches, rocky cliffs, rolling hills, and steep mountains.

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