DEEP-SEA CORALS: THREATS AND MANAGEMENT STRATEGIES

Conservation of deep-sea coral species depends on carefully planned management strategies. Many deep-sea corals are slow growing and therefore take decades or even centuries to regenerate if they are damaged or destroyed. Thus, the most effective conservation tools prevent or strictly limit the initial amount of anthropogenic damage done to corals. Currently, the main threat to deep-sea corals is mechanical destruction by bottom-impacting fishing gear, particularly bottom trawls, which crush corals as gear is dragged along the ocean floor (see figures below). Oil and gas drilling operations also pose a threat, because corals can be crushed or smothered in toxic debris at drill sites. Pipelines that service drill sites may also destroy deep-sea corals.

Managers have used a variety of methods to contain or prevent damage done to deep-sea corals by fishing gear. Deep-sea corals are often associated with rough, structurally complex benthic habitats. Rockhopper and roller gears are rubber or steel discs and balls attached to the leading edge of a bottom-trawl net that allow trawlers to drag their nets over rough terrain without snagging. Larger rockhopper gear allows trawl nets to enter more complex terrain. Therefore, size restrictions on gear can prevent the expansion of bottom-trawl fisheries into some deep-sea coral habitats. The Pacific, New England, and Mid-Atlantic Fishery Management Councils have used rockhopper-size restrictions to keep bottom trawls out of habitats that include deep-sea corals. In addition, a few states have implemented roller restrictions in state waters. For example, Connecticut restricts rollers to a six-inch diameter. New Jersey and New York also have roller restrictions although they are less stringent (rollers up to 18 inches are allowed).

New trawl gear that can be used at increasingly greater depths has rapidly increased the area of seafloor accessible to trawl fleets throughout the world. As a result, deep-sea habitats that were once protected by intrinsic gear limitations have come under increased trawling pressure. Like gear-size restrictions, freezing the “footprint” of bottom-trawl fisheries is meant to prevent the continued expansion of bottom trawling into previously untrawled waters. This management tool restricts damage to habitats on the seafloor that have already been repeatedly trawled. The North Pacific Fishery Management Council recently decided to use this containment strategy when it limited trawling off the Aleutian Islands to 25,000 mi² of ocean floor currently trawled.

Areas of known or suspected importance to deep-sea corals can also be closed to gears that are known to damage bottom
habitat. Marine protected areas (MPAs) are ocean zones designed to preserve specific habitats and marine populations. For example, Washington has protected benthic habitats in its state waters using a combination of area closures in the bottomfish trawl fishery and complete bans on other bottom-trawl fisheries. The seafloor is also protected in the Flower Garden Banks National Marine Sanctuary, located 100 miles offshore of Texas in the Gulf of Mexico. Anchoring within the sanctuary is prohibited except at designated mooring sites, and the use of trawls is also illegal.

Deep-sea coral habitats can also be protected from destructive fishing practices under Magnuson-Stevens Act protections for essential fish habitat (EFH) and habitat areas of particular concern (HAPC). A 1996 amendment to the Act defined essential fish habitat as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Under the amendment, councils must add EFH considerations to their fishery management plans by identifying and describing essential habitat for managed fish species, minimizing the fishing impact on EFH, and identifying additional steps to conserve EFH. A region within an essential fish habitat may be designated a HAPC based on its ecological importance, sensitivity to human impact, rarity, and the degree of stress that development activities put on the habitat. Several management councils have made an effort to put meaningful protections on deep-sea coral habitats designated as EFH. For example, under their monkfish management plan, the New England and Mid-Atlantic Fishery Management Councils have banned monkfish bottom trawling in two deep-sea canyons known to contain corals. The South Atlantic Fishery Management Council created the 300 nm² Oculina Bank coral HAPC as part of its coral management plan and closed the area to all bottom-impacting fishing gears.

**THE FUTURE**

While some fishery management councils have taken steps to protect deep-sea corals from bottom-impacting gears, protections in U.S. waters remain inconsistent and are not yet comprehensive. In December 2004, the President highlighted deep-sea coral protection as an action item in his Ocean Action Plan. The issue also has reached both houses of Congress: the Magnuson Stevens Fishery Conservation and Management Act. A region within an essential fish habitat may be designated a HAPC based on its ecological importance, sensitivity to human impact, rarity, and the degree of stress that development activities put on the habitat. Several management councils have made an effort to put meaningful protections on deep-sea coral habitats designated as EFH. For example, under their monkfish management plan, the New England and Mid-Atlantic Fishery Management Councils have banned monkfish bottom trawling in two deep-sea canyons known to contain corals. The South Atlantic Fishery Management Council created the 300 nm² Oculina Bank coral HAPC as part of its coral management plan and closed the area to all bottom-impacting fishing gears.

**FOR MORE RESOURCES:**

- Oculina Bank HAPC: [http://oceanexplorer.noaa.gov/explorations/islands01/background/islands/susp6_oculina.html](http://oceanexplorer.noaa.gov/explorations/islands01/background/islands/susp6_oculina.html)
- Deep Sea Coral Protection Act: [http://www.mcbi.org/destructive/Justification%20of%20DSCPA.pdf](http://www.mcbi.org/destructive/Justification%20of%20DSCPA.pdf)

**PHOTO CREDITS:**

Page 46 (left): Courtesy of Dr. R. Grant Gilmore, Dynamac Corporation

Page 46 (right): Lance Horn, National Undersea Research Center/University of North Carolina at Wilmington

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