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Trawlers Destroying Deep-Sea Reefs, Scientists Say

*John Pickrell**for National Geographic News**February 19, 2004*

Typically imagined as explosions of color in shallow, warm, azure tropical waters, coral reefs are often regarded as the rain forests of the sea. It wasn't until recent years that scientists realized that reefs at much greater and darker depths also teem with life—and may be home to the majority of coral species.

Yet even before these deep reefs have been fully explored and documented, they are being destroyed by unregulated deep-sea trawling. Concerned that many species may be lost before they are identified, a group of 1,136 scientists from 69 countries is appealing for new laws to protect deep-ocean corals and sponges.

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Deep-sea corals at Madison-Swanson Marine Fishery Reserve south of Panama City, Florida.

Photograph courtesy Lance Horn, National Undersea Research Center/ University of North Carolina at Wilmington

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"Based on current knowledge, deep-sea coral and sponge communities appear to be as important to the biodiversity of the oceans and the sustainability of fisheries as their analogues in shallow tropical waters," said a statement released earlier this week at both the American Association for the Advancement of Science meeting in Seattle and the United Nations Convention on Biological Diversity held in Kuala Lumpur, Malaysia.

"We urge the United Nations and appropriate international bodies to establish a moratorium on bottom trawling on the high seas," the scientists said. They include Harvard University's renowned ecologist Edward O. Wilson and former head of the U.S. National Oceanic and Atmospheric Administration, D. James Baker.

Great Depths

Scientists first discovered deep-sea coral forests in the 19th century but only

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recently realized how widespread and important they are. Growing to hundreds, or even thousands of years old, deep-sea corals are filter-feeding organisms that can form dense reefs in cold and deep waters as far apart as Alaska, Tasmania, Ireland, and Colombia.

Dated at 1,800 years old, one slow-growing deep-sea coral may rival some kinds of pine trees as the world's oldest organism. Some of these corals even resemble trees, growing up to 10 meters (33 feet) in height. They have been discovered as deep as 3.5 kilometers (2.2 miles). *Lophelia* coral reefs in cold North Atlantic waters can harbor 1,300 invertebrate species, and 850 species of coral have been found on underwater plateaus of the Tasman and Coral Seas.

These forests provide habitats for huge numbers of important deep-sea species, the scientists said. Individual corals could produce chemicals potentially useful for treating high blood pressure, cancer, and chronic pain.

However, many species are being discovered only as they are destroyed by fishing, said Lance E. Morgan. Morgan is chief scientist with the U.S.-based Marine Conservation Biology Institute (MCBI), the nongovernmental organization responsible for organizing the petition. "Norway only found that it had these corals because of surveys for oil," Morgan said. "So they were discovered and significantly damaged at the same time."

Though oil and gas prospecting, deep-sea mining, and global warming are all significant threats, today's greatest danger comes from fishing trawlers, the scientists wrote.

Indiscriminate Destruction

Trawlers are fishing vessels that drag enormous and heavily weighted fishing nets at great depths across the seafloor. These can be weighted with rollers or chains that crush everything in their path, Morgan said, smashing corals and sponges and killing enormous quantities of nontargeted animals as well as the fish (including Chilean sea bass, orange roughy, and cod) and shrimp the nets are set to catch.

Another recent study by the MCBI reveals that bottom trawling is the most destructive fishing practice—closely followed by the use of invisible curtain-like gill nets and longlines. The longlines are threaded with many thousands of hooks and stretch for up to 50 miles (80 kilometers). In 2000 up to 2.3 billion pounds (one million tons) of unwanted sea life was discarded from nets in the U.S. alone, according to that research.

"The damage to our ocean floors is more extensive and perhaps even worse than tropical deforestation," said Elliott Norse, president of the MCBI. "We must bring these issues to the forefront of fisheries management before it is too late," he said. Scientists believe damage done to these deep-sea reefs may take centuries to correct, or be irreversible due to the slow-growing nature of the corals.

"Allowing trawling in coral forests is the worst thing we are doing in the ocean today," said Daniel Pauly, fisheries biologist at the University of British Columbia in Vancouver. He also signed the petition. "Nothing could be dumber than destroying the habitats that depleted fish populations need to recover. Governments should stop pussyfooting around and do something useful," he said.

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The statement commends nations such as Australia, New Zealand, Canada, and Norway for offering some protection to deep-sea corals in their waters. But calls on the U.N. and other bodies to immediately curtail all bottom trawling until more study and mapping can be done of vulnerable deep-sea coral and sponge communities.

Reef Smothering in Shallows

Meanwhile, scientists have found new and compelling evidence that pollution is the major factor linked to declines of shallow-water coral reefs. Previous evidence implicated overfishing, linked to a reduction in seaweed grazing.

A new study published in the current issue of the *Journal of Experimental Marine Biology and Ecology* reveals that seaweed fertilized by nitrogen pollution from an inland pond is swamping coral reefs off the coast of the Bahamas.

Marine biologist Brian Lapointe, of the Harbor Branch Oceanographic Institution in Florida, found that coral reefs progressively farther out from that pond's coastal outlet were increasingly healthy and less choked with seaweed. Other experimental work by his team revealed that the number of grazers on a given reef had little effect on the amount of seaweed, but rather affected the proportion of different types of seaweed found there.

Another long-term study soon to be published in the same journal shows that the strict enforcement of fishing bans in one Florida Keys marine park failed to reduce seaweed overgrowth.

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"The reason this issue is so important is that we are losing our coral reefs at a very accelerated rate," said Lapointe. "These systems are ... in catastrophic decline in many parts of the world." The research may help focus conservation efforts, he said. While slowing overfishing is important, efforts should be concentrated on minimizing pollution to restore overgrown reefs, he said.

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