

Liquidating deep-sea capital?

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Over the past decade, scientists have documented massive fishery declines.^{1,2}

Increasingly, impacts of fishing, particularly those of bottom trawling, now extend to the deep sea, causing depletion of deep-sea fishes and irreversible damage to deep-sea habitats (Figure 1).³ Biological, economic, and institutional features of the deep sea combine to make these fisheries particularly vulnerable. Most are on the high seas and thus susceptible to the competitive pressures of open access. Slow growth rates of deep-sea fish exacerbate this problem. Because deep-sea fisheries cannot generate sustained income flows at even moderate rates, discounting considerations provide greater incentive to liquidate the resources rather than catch them sustainably.⁴ Yet, deep-sea bottom trawl fisheries do not contribute substantially to national economies or global

food security, comprising less than 0.5 percent of global fisheries value.⁵ International political will is needed to ensure that deep sea resources are adequately protected.

The slow life histories of deep-sea fishes make them vulnerable to overexploitation, with unknown capacity for recovery. Several deep-sea fishes have declined sufficiently (Figure 2a) to be considered endangered.⁶ The boom and bust nature of these fisheries has been evident since the advent of deep-sea trawling in the 1960's. Many deep-sea fisheries expand to new areas before any scientific exploration has occurred. Consequently, there is often no scientific record of what existed before trawling.

Habitat structure in the deep sea is provided by delicate species such as long-lived deep-sea corals and glass sponges,⁷ with order of magnitude longer life spans and lower growth rates than shallow water species. Structurally complex habitats, such as seamounts, are hotspots of species diversity and endemism. Fully one-third of the species surveyed from southwest Pacific seamounts were new to science and possible endemics.⁸ These fragile structures are no match for modern deep-water trawling gear; massive steel doors, rollers, cables and nets that weigh over 15 tonnes can, in a few hours, destroy deep-sea corals and sponge fields that have taken centuries to millennia to grow. Destroying these habitats thus may eliminate important option values for society.

Spurred by international concern, the United Nations General Assembly adopted a resolution in 2004, calling on nations to take “urgent” action to protect deep-sea corals, seamounts and other vulnerable marine ecosystems from trawl impacts. In 2006 these

actions were reviewed by the Secretary General of the United Nations in a report to the UN General Assembly, which concluded that deep sea areas, in international waters, continue to lack protection from fishery impacts.⁹

National governments are increasingly designating areas closed to trawling and recently established closures comprise almost 10.4×10^6 km² (Figure 2b). On the high seas, effective regulation can only be accomplished through binding international agreements, however such regimes will take time to be established, and deep-sea marine ecosystems do not have the luxury of time.

To protect deep-sea fishes and habitats in international waters, immediate action is needed. At its November 2006 meeting, the UN General Assembly should heed the calls of scientists, the conservation community, as well as several fishing nations to adopt a resolution establishing an interim prohibition on all high seas bottom trawling until comprehensive, accountable and enforceable regimes are established.

References

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Figure captions

Figure 1. Before and after trawling on a giant carbonate mound, Porcupine Bank, NE Atlantic: (a) Rich coral fauna at 750 m water depth on the sloping side of the mound, (b) Broken corals and lost trawl net.

Figure 2. Trends deep-sea fisheries and efforts by nations to limit bottom trawling: (a) Landings of the most valuable deep-sea fishes 1965-2004. Roundnose grenadier is from the slopes of the North Atlantic, oreos and orange roughy are from Pacific seamounts, and Patagonian toothfish is from deep waters of the Antarctic. (b) Number of countries banning trawling and cumulative area closed.



a.



b.

