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TITLE: The impacts of deep-sea fisheries on benthic communities: a review

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ABSTRACT:

Abstract Deep-sea fisheries operate globally throughout the world's oceans, chiefly targeting stocks on the upper and mid-continental slope and offshore seamounts. Major commercial fisheries occur, or have occurred, for species such as orange roughy, oreos, cardinalfish, grenadiers and alfonsino. Few deep fisheries have, however, been sustainable, with most deep-sea stocks having undergone rapid and substantial declines. Fishing in the deep sea not only harvests target species but can also cause unintended environmental harm, mostly from operating heavy bottom trawls and, to a lesser extent, bottom longlines. Bottom trawling over hard seabed (common on seamounts) routinely removes most of the benthic fauna, resulting in declines in faunal biodiversity, cover and abundance. Functionally, these impacts translate into loss of biogenic habitat from potentially large areas. Recent studies on longline fisheries show that their impact is much less than from trawl gear, but can still be significant. Benthic taxa, especially the dominant mega-faunal components of deep-sea systems such as corals and sponges, can be highly vulnerable to fishing impacts. Some taxa have natural resilience due to their size, shape, and structure, and some can survive in natural refuges inaccessible to trawls. However, many deep-sea invertebrates are exceptionally long-lived and grow extremely slowly: these biological attributes mean that the recovery capacity of the benthos is highly limited and prolonged, predicted to take decades to centuries after fishing has ceased. The low tolerance and protracted recovery of many deep-sea benthic communities has implications for managing environmental performance of deep-sea fisheries, including that (i) expectations for recovery and restoration of impacted areas may be unrealistic in acceptable time frames, (ii) the high vulnerability of deep-sea fauna makes spatial management?that includes strong and consistent conservation closures?an important priority, and (iii) biodiversity conservation should be > balanced with options for open areas that support sustainable fisheries.

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