

EXECUTIVE SUMMARY

This report, assembled by a group of researchers at the Fisheries Centre, University of British Columbia, Vancouver, Canada, and colleagues in San Diego, USA and Kiel, Germany, reviews present knowledge on seamounts, the underwater mountains dotting the bottom of the world's oceans, and home to a rich, if fragile, diversity of organisms. One definition of seamounts identifies them as reaching at least a thousand meters (about 3000 ft) from the sea floor. Of volcanic origin, seamounts can be visualized as thin cones reaching up, but not fully breaching the sea surface, and supporting often isolated, but rich underwater ecosystems, now increasingly threatened by unregulated fishing.

Due to their narrow base, seamounts can be distinguished from other underwater structures only on high-resolution sea bottom maps. The first contribution in the report, by Adrian Kitchingman and Sherman Lai, identifies and discusses the distribution of over 14,000 seamounts in the world oceans. However, it can be assumed that they would have located more seamounts, had one of the presently classified, high-resolution global sea bottom maps been available to them. About half of the seamounts they identified occurred within the 200 mile economic zones (EEZs) of maritime countries, a theme to which we shall return.

Only a few dozen seamounts have been thoroughly investigated in terms of the animals they contain. Karen Stocks, based on the SeamountsOnline database, which she briefly presents, reviews the knowledge on the invertebrates, emphasizing the high fraction of endemic species occurring on seamounts, i.e., species with narrow ranges, occurring only on one, or a few closely packed seamounts. She also highlights the tendency for seamount invertebrates to take the bushy shape of plants, optimal for capturing drifting food items, but which renders them extremely vulnerable to trawl nets and other fishing implements. Rainer Froese and Arlene Sampang, based on FishBase, the global online fish database, lists and reviews the fishes of seamounts and, based on the typical properties (notably high longevity) of species that have been studied, infers a high potential vulnerability of seamount fish to fishing. These analyses are the most comprehensive reviews of seamount species to date.

The theme of fish vulnerability is expanded in the next two contributions, one by William W. L. Cheung, Tony Pitcher and Daniel Pauly, who developed a new, rigorous method for inferring vulnerabilities from a wide array of features of fish species, and compared this new method with existing approaches, to which it is superior. The second, by Telmo Morato, William W. L. Cheung and Tony Pitcher, applies this new approach to a comparison between seamount fishes and all other marine fishes in FishBase, and shows seamount fishes to be, indeed, far more vulnerable to overexploitation by fishing than representative species of other habitat types. That these considerations are not mere academic exercises is illustrated by the analysis of existing seamount fisheries catch data by Reg Watson and Telmo Morato, which confirms that seamount fisheries - most of which use bottom trawl gear - induce rapid depletions of their resource base, and generally lack sustainability. This puts on a global basis the previous, rather depressing case studies that had been extracted from well-studied and seemingly 'well-managed' seamount fisheries.

The high vulnerability of seamount organisms to fisheries indicates a strong need for seamounts to be protected, both in terms of the biodiversity they contain, and in terms of sustaining their quickly-depleted fisheries resource. Jackie Alder and Louisa Wood show, on the other hand, that very few seamounts are presently protected, even though, as mentioned above, many of them occur within the EEZ of maritime countries. With approximately half occurring in international waters, beyond these zones of national jurisdiction, the responsibility to conserve seamounts as part of the global common heritage belongs to all nations. Clearly, this represents a challenge for the international community and individual countries wishing to conserve the precious biodiversity of these islands of the deep.

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