

MANAGING AND PROTECTING SEAMOUNTS ECOSYSTEMS

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ABSTRACT

The overwhelming evidence of the fragility of seamounts and their associated resources suggests that they require a high level of protection. Seamounts have a global distribution, existing within and beyond areas under national jurisdiction. Seamounts in areas under national jurisdiction can be protected using legal mechanisms such as protected areas and fisheries restrictions. However, the legal and geopolitical challenges to protecting international waters, including seamounts, are numerous and far-reaching: there is no unified managing authority, and so seamounts in particular are subject to unmanaged exploitation by several countries. The vulnerability of seamount species and lack of management in the high seas has prompted NGOs to call for the designation of international protected areas for fragile deep-sea ecosystems, including seamounts, and for a United Nations moratorium on high seas bottom trawling until a management regime is adopted. In this paper, we present preliminary analyses of: 1) the distribution of seamounts inside and outside areas under national jurisdiction, to assess the extent to which gaps in the international legal regime might compromise the maintenance of the ecological values of seamounts, and 2) the number of seamounts already protected under existing mechanisms within EEZs. We discuss the nature of existing management and protection of seamounts, and examine the various legal and institutional instruments, which may be used to improve seamount management.

INTRODUCTION

Seamounts are unique marine ecosystems, which often support fragile habitats and vulnerable species of flora and fauna (Morato et al., this vol.; Stocks, this vol.). These unique characteristics and their associated biodiversity, high potential endemism (Richer de Forges et al., 2000; Stocks, this vol.), fishery values and threats (both anthropogenic and natural), are explored in detail in other chapters of this report. In general, our knowledge of seamounts is far less comprehensive than for many other marine ecosystems and, so the importance of and need to protect these ecosystems is only just being recognized. However, the fragility of seamount ecosystems, and the magnitude of threats posed to them (Koslow, 1997; Morato, 2003), renders an assessment of their management needs an urgent task.

A preliminary analysis of the distribution of seamounts, inside and outside areas under national jurisdiction, was performed. Using the predicted seamount distribution described in Kitchingman and Lai (this vol.), we estimate that 47% of seamounts (> 1000m tall) fall inside Exclusive Economic Zones (EEZs) and 53% occur in international waters. This result is markedly different from the general perception that most seamounts occur outside areas under national jurisdiction and has profound implications for the ways in which appropriate levels of seamount management protection might be achieved. In this paper, we examine the available instruments and institutional arrangements and suggest options for the future management and protection of seamounts nationally and internationally.

CURRENT PROTECTION

The current level of protection of seamounts was also assessed. Existing marine protected area (MPA) data on the global scale is available through the World Database on Protected Areas (WDPA), maintained by the United Nations Environment Programme's World Conservation Monitoring Centre (UNEP-WCMC). A preliminary overlay analysis was undertaken with this MPA data and the seamount data. Approximately 84 MPAs cover 346 seamounts found in EEZs; this is about 5% of the seamounts located within EEZs and identified by Kitchingman and Lai (this vol.). However, they underestimate the global number of seamounts, and hence this 5% value is almost surely too high, perhaps by as much as a factor of five to ten. However, even this high value indicates that, in comparison to other critical habitats such as coral reefs and seagrasses, seamounts are much less well protected within EEZs (Figure 1), and completely unprotected in the high seas. This difference can be explained by numerous factors. Firstly, people have a greater awareness of the threats and values of coral reefs and mangroves or for charismatic mega-fauna

such as whales and dolphins through their greater visibility as well as the media attention that these habitats and animals receive. Consequently, there is a longer history of protecting them. Secondly, seamounts were little known other than by fishing fleets until more recently. Thirdly, the freedom of the high seas as defined by the United Nations Convention on Law of the Sea (UNCLOS) left the substantial proportion of seamounts in international waters vulnerable to overexploitation and with little legal leverage to prevent it.

Strategies for seamount protection are consequently nascent and as such provide resource managers with the opportunity to review the lessons learned to formulate an effective and efficient model for managing seamounts and their associated resources.

CURRENT MANAGEMENT INSTRUMENTS

National

Most countries have a range of legislative measures that can be used to manage and protect seamounts and their associated biodiversity, although few have actually deployed them. The nature and scope of national legislation and policy instruments that are commonly used include:

Legislation

- Fisheries;
- Minerals (including gas and oil);
- Transportation and Navigation;
- Environmental Impact Assessment;
- Hazardous Waste Disposal;
- Protected Areas;
- Biodiversity Protection.

Policy

- Ocean and Coastal Planning;
- Coast Guard and Defense Force Roles.

Protected area legislation and policies potentially provide one of the most comprehensive instruments for managing seamounts in most countries if the mandate to control other activities such as fishing and mining is included. Few countries have used protected area legislation to protect their seamounts. Despite an estimated 155 countries having seamounts within their maritime jurisdictions, only 22 countries appear to have applied protected area legislation to all or a portion of them, and not in all instances has such legislation resulted in meaningful protection. The most significant areas of protected seamounts are in the Northwestern Hawaiian Islands (341,000 km²) with approximately 66 seamounts, the Galapagos (140,000 km²) with 24, Tasmania (Australia) where more than 17 seamounts within an area of 370 km² are protected from all forms of fishing except for tuna long-lining (DEH, 2004) and in Canada where the Bowie-Hodgkins and Davidson complex is a pilot marine protected area encompassing more than 1400 km² (AXYS Environmental Consulting, 2003).

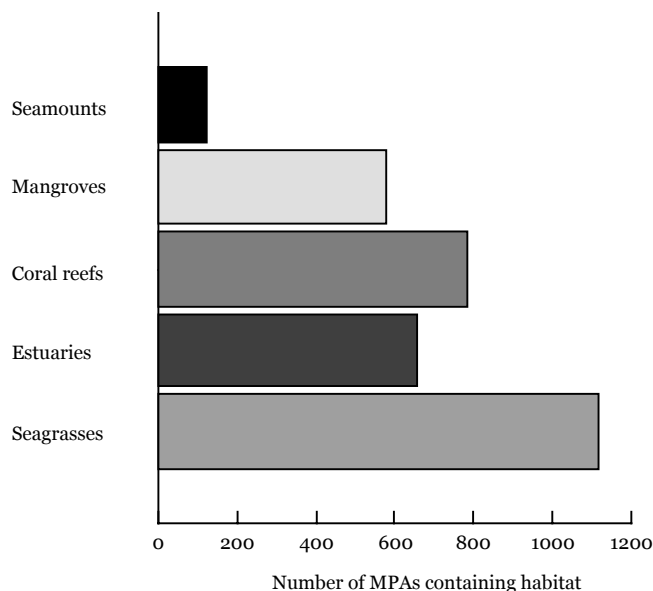


Figure 1. Number of MPAs containing critical habitat globally [adapted from UNEP-WCMC protected areas, coral reef, mangrove and seagrass databases (WDPA Consortium, 2004; WCMC-UNEP, 2004) and Sea Around Us Project estuaries and seamounts database (<http://www.seaaroundus.org>)].

Much more effort is currently given to managing fish resources on seamounts within national jurisdictions than in international waters. Australia, Portugal, New Zealand and the United States all have specific fisheries management measures in place aimed at either sustainably managing resources or in some cases such as New Zealand, rebuilding fish resources (AXYS Environmental Consulting, 2003; Ministry of Fisheries, 2003; Commission of the European Communities, 2002). However, the intrinsic vulnerability of seamount fishes (Froese and Sampang, this vol.; Morato et al. this vol.), the unsustainable nature of seamount fisheries (Watson and Morato, this vol.) and the general history of poor management of many commercially important fish (Ludwig et al. 1993; Pauly et al. 2002) make it abundantly clear that fisheries management alone will not be sufficient to protect these fragile ecosystems, and the fisheries from themselves (see also CDB 2003; Gianni 2004).

Seamounts managed outside of the scope of protected area legislation may be subjected to the same complex institutional and administrative arrangements that are used to manage coastal areas in many countries. Given the limited progress that has been made in effective management of the coasts globally, managers and policy makers are well advised to avoid using many of the coastal management models in current use. National ocean policy may have potential to provide for efficient and effective management of seamounts. However, few countries have developed their ocean policies and even fewer have implemented such policies (Alder and Ward, 2001; Gianni 2004).

International

There are no international instruments that specifically protect or manage seamounts in the high seas. There is growing concern for the management of deepwater ecosystems on the high seas as shown by the recent global and regional initiatives:

- IUCN Amman Resolution on High-Seas MPAs (October 2000) (de Fontaubert, 2001);
- UN General Assembly Resolution on Ocean and Law of the Sea regarding management of risks to marine biodiversity including seamounts (A/58/L.19) (United Nations, 2003);
- High Seas Marine Protected Areas (HSMPAs) Action Plan (WWF-IUCN, 2003);
- Deep Sea Fishing Conference held in December 2003 in Queenstown, New Zealand;
- Recommendations of the 7th Conference of the Parties of the Convention on Biological Diversity (CBD, 2003).

These initiatives, along with earlier ones, all call for the protection and management of deep-sea ecosystems including seamounts within the framework of existing international instruments where possible. There are many international instruments established that provide a range of options for managing and protecting seamounts (Table 1).

UNCLOS together with its subsidiary Mining Act and Fish Stocks Agreement contain provisions to establish and manage areas closed to fishing and other extractive or harmful activities outside of national jurisdictions if such measures are undertaken in co-operation with the States that are involved. This form of cooperative agreement is seen in Regional Fish Bodies that have implemented strict fisheries conservation measures including areas closed to fishing. For example, some international waters within the NAFO Regulatory Program are closed to fishing (DFO, 2004).

While there are a number of international instruments that, if further developed, could be used to manage and protect seamounts, there is no single instrument that has sufficiently wide reaching provisions to manage them on an ecosystem basis. Creating yet another instrument to manage a single ecosystem is possible, but given the jurisdictional disputes that would arise, this option is highly questionable. Many binding instruments have a clause which enables member countries to object to provisions and therefore avoid taking decisions that threaten national interests at the expense of the resources and ecosystems (Alder and Lutgen, 2002). If a new instrument is necessary it should contain mechanisms that compel countries to abide by the instruments provisions and create a disincentive to disregard the provisions as demonstrated, for large pelagic fisheries, by the economic sanctions against countries that fish outside of ICCAT's annual management measures. The lack of an adequate governance regime for bottom fish in the high seas, combined with evidence that seamount fisheries tend to be unsustainable (Watson and Morato, this vol.), has prompted Non-Governmental Organizations (NGOs) to call for an United Nations moratorium on high sea bottom trawling until an appropriate regime can be developed.

Table 1: International Instruments and their Application in Managing and Protecting Seamounts

Instrument	Potential for Seamount Management and Protection
Binding	
UNCLOS-Mining Agreement	Under Article 162.2.x of UNCLOS the International Seabed Authority may disapprove an area for exploitation where substantial evidence exists that mining activities pose a serious risk to the marine environment. Article 145 provides for the protection and conservation of the natural resources of the Area and the prevention of damage to the flora and fauna in the marine environment.
UNCLOS – Pollution	Under Part XII of UNCLOS States are obliged to protect and preserve the marine environment, especially ‘rare or fragile ecosystems as well as the habitat of depleted threatened or endangered species’ and to take measures individually or collectively to not cause pollution within and beyond their jurisdictions.
UNCLOS - Fisheries	UNCLOS obliges States to cooperate and conserve the living resource of the high seas. The States that are party to the Convention can take whatever measures are necessary to ‘maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield’ and measures such as marine protected areas are not prohibited.
Fish Stocks Agreement	This Agreement addresses the shortcomings of UNCLOS in dealing with straddling and highly migratory stocks and is very relevant to fish on seamounts. The Agreement requires States to adopt compatible management measures without specifying which measures prevail in the case of disagreements (de Fontaubert, 2001). The Precautionary Principle also features prominently in the agreement and obliges States to be more cautious when information is inferior and not to use a lack of information as justification to avoid taking appropriate conservation and management measures
Regional Fisheries Agreements/Conventions	Most agreements contain provisions to undertake a range of fisheries management options that could be used to protect and manage seamount resources including closing areas to fishing, restricting the use of specific gear (e.g. trawls) and the size of species caught. Agreements, which restrict the range of species they can manage may need to be amended to include seamount species.
Convention on Biological Diversity and Jakarta Mandate	Article 4 extends the Convention beyond national jurisdictions for processes and activities undertaken by member States while the Jakarta Mandate includes calls for the establishment of MPAs.
Convention on the International Trade of Endangered Species (CITES)	CITES could be used to the management and protection of selected seamount species. Currently there are no seamount species listed, however, there have been calls to add the Patagonian toothfish to the list (Willock, 2002).
London Convention and IMO Particularly Sensitive Sea Areas	Waste disposal at sea is managed through this convention. The activities of ships, including discharges in the vicinity of seamounts can also be managed using Particularly Sensitive Sea Areas (PSSAs).
World Heritage Area Convention	The Convention stipulates that World Heritage Areas must be contained within national boundaries and therefore of limited use in managing and protecting seamounts in international waters.
Regional Seas Programs	Some of the treaties that establish specific Regional Seas Programmes extend into the high seas. In addition some treaties have provisions and protocols to protect areas and wildlife.
Non Binding	
FAO Code of Conduct	The Code can be used to manage fisheries on seamounts.
Agenda 21 and World Summit on Sustainable Development (WSSD)	The international initiatives have called for the establishment of marine protected areas on the high seas. The WSSD called for a network of Marine and Coastal Protected Areas within and beyond national jurisdiction by 2012.
FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing	Seamounts are considered major centres of IUU fishing and therefore addressing the issue of IUU will contribute to managing and protecting seamounts (Rigg, 2004).

It could be argued that the International Whaling Convention has set the precedent for managing for a single species and it was used to establish two sanctuaries in the high seas (Indian Ocean and Southern Ocean), and therefore management for a single ecosystem is justified. However, recent calls for seamount management and protection promote the use of existing instruments, especially those that are consistent with the United Nations Convention on Law of the Sea. Kenchington (1990) suggested the same for coastal management. In the absence of a single instrument, seamount management and protection will need to use a mix or further elaboration of the above conventions and agreements. This leads to the question of the most appropriate institutional arrangement.

INSTITUTIONAL ARRANGEMENTS

Many of these instruments listed in Table 1 are implemented through international organizations such as the United Nations, Regional Fish Bodies (e.g. the North Atlantic Fisheries Organization), Secretariats (e.g. that of the Convention on Biological Diversity) and Commissions (e.g. the International Whaling Commission). New models for managing and protecting seamounts need to be explored. These current models as well as those used in coastal management are far from ideal since they have not prevented the decline of many fish stocks or the degradation of coastal ecosystems. Alternative institutional arrangements that use cybernetics have been suggested for managing coasts (Kay et al., 2003) and could be considered for managing seamounts.

Any institutional arrangement that is used needs to manage seamounts on an ecosystem basis, embrace the precautionary principle and take an adaptive management approach. The limited knowledge on seamount ecosystems and their vulnerability to overexploitation necessitates a precautionary approach. Management of seamounts as a whole ecosystem on the high seas will be the first attempt to take ecosystem management into a truly international situation. Undoubtedly, there will be several lessons learned before the most appropriate instruments and management arrangements emerge.

Seamounts are well suited to an adaptive management approach since there are some seamounts that are not exploited, which could serve as control sites in an experimental approach, as well as serving as test cases for MPAs. De Fontaubert (2001) suggested that States should seriously consider establishing high-seas MPAs over seamounts that are not fished. In some circumstances, (e.g., when dealing with straddling stocks), States can use instruments such as the Fish Stocks Agreement and institutions such as regional fisheries bodies to take a precautionary and adaptive approach. Seamounts may be the one set of ecosystems where a HSMPA may succeed and provide lessons learned for other countries considering similar initiatives to draw upon (de Fontaubert, 2001).

Enforcement of the provisions of any future instrument or arrangement will need to be considered. Illegal, unreported and unregulated fishing occurs on seamounts and needs to be addressed as part of any seamount management initiative. Many seamounts in the high seas are isolated and the cost of surveillance on the water or remotely will be expensive for any country. This is clearly demonstrated by the cost (more than 3.7 million USD) to capture an Uruguayan vessel illegally fishing for Patagonian toothfish in Australia's EEZ (Goldsmith, 2003).

Current arrangements for enforcing the provisions of regional fisheries arrangement in the high seas are usually the responsibility of member countries. The effectiveness of these arrangements is highly variable depending on the membership composition (Alder and Lutgen, 2002). Regional fish bodies such as NAFO and NEAFC, with most members from highly developed countries in North America and Europe, have relatively well-funded and effective enforcement programs compared to regional fish bodies made up of developing countries such as the Fishery Committee for the East Central Atlantic (West Africa).

In the short-term, regional fish bodies can expand their jurisdiction to include managing fisheries resources on seamounts, especially bottom trawling (Gianni, 2004), and where stocks are at risk close the areas to fishing (CBD, 2003). Similarly regional seas bodies could extend their mandate to include seamounts and work with regional fish bodies to better manage these ecosystems. As well, we believe that increased support should be given to FAO's Action Plan to Prevent, Deter and Eliminate Illegal Unreported and Unregulated Fishing. On the longer term, however, dedicated measures will have to be taken to explicitly protect seamounts in high sea areas.

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