The status of natural resources on the high-seas

Part 1: An environmental perspective
Part 2: Legal and political considerations

An independent study conducted by:
The Southampton Oceanography Centre
& Dr. A. Charlotte de Fontaubert
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SUMMARY

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Commissioned by WWF and IUCN.

Overview

The value of creating Marine Protected Areas (MPAs) as a tool for conserving areas of high, valuable, sensitive or rare biodiversity that are potentially threatened is well established. WWF and IUCN have both adopted a strategy of facilitating the establishment of networks of representative MPAs. Experience from managing MPAs around the world indicates that political will, legal security and stakeholder support is necessary to establish, manage and enforce the protected area status. As a necessity, MPAs have been located close to the coasts of nations where there is sufficient political will and where they can be nested within the legislation of those states. In recent years, there has been an increasing awareness amongst states and NGOs that little protection is currently afforded to marine areas outside of 200 mile Exclusive Economic Zones.

WWF and IUCN have commissioned an independent study, by leading specialists in the field, of high-seas habitats, resources, threats and legal status. A definition of the resources, either biodiversity and/or exploitable reserves, that occur beyond national jurisdiction, and potential for any threats to these resources has two main benefits:

- the need for, and extent of, protection can be better estimated;
- the types of legislation and governance that would be required to afford real protection and/or management can be determined and focused.

It is expected that there will not be a single solution suitable for all potential protected areas. In formulating transparent mechanisms for protection, the rights of legitimate users of the high-seas must be respected, so that the protected status has a chance of being respected.

This study is an independent, objective, scientific and legislative review of published evidence that will contribute to:

- a listing of the natural resources, primarily biodiversity related, that occur in areas outside of the jurisdiction of coastal states;
- identification of the types of threats or potential threats that are, or may, impact on those resources;
- an indication of the types of areas, if any, that would seem to be potential candidates because of location, natural resource, or biodiversity, but that would in practice be unlikely, perhaps for reasons of politics, biodiversity or legislation;
- an informed opinion as to the current legal status of various forms of protected areas on the high-seas;
- an interpretation of the potential for adapting current legal institutional arrangements to afford protection.

In short, this study objectively examines if there are any areas on the high seas that are of particular conservation interest but are being, or expected to be threatened. If that is the case, the study further examines if there are currently any legislative instruments that could be used in order to afford those areas the protection they deserve.
Part 1: An environmental perspective

Approximately 50% of the Earth’s surface is occupied by high-seas areas – open ocean and deep-sea environments lying beyond the 200 nautical mile limit of the Exclusive Economic Zones of coastal states. These high-seas areas are open-access common resources, and as such may be particularly susceptible to over-exploitation. Until relatively recently there was little perceived threat to these areas. However, in recent years there has been a rapid expansion in two industries (demersal fishing and oil production) that can currently operate down to water depths of at least 2,000 m. These operations pose a potential threat to the deep-sea environment of high seas areas. There are also a number of existing threats to open ocean areas, e.g. direct and indirect impacts on fish, seabirds and cetaceans. Further, there are a number of suggested or developing technologies that could pose a threat to high-seas areas, e.g. CO₂ dumping, biotechnology, the exploitation of gas hydrates and hydrothermal vent heat energy.

It is therefore timely to review the status of natural resources in high-seas environments in light of these existing or potential threats. Deep-sea and open ocean environments are continuous and highly interconnected, however, there are a number of relatively discrete or localised geographic features / habitats / biological communities that have particular scientific, societal or economic interest.

- Hydrothermal vents
- Deep-sea trenches
- Polymetallic nodules
- Gas hydrates
- Seabirds
- Transboundary fish stocks
- Seamounts
- Deep-sea ‘coral reefs’
- Cold seeps and pockmarks
- Submarine canyons
- Cetaceans

This report identifies these areas of interest, reviews their significant characteristics, assesses existing or potential threats to them, and their potential value as High-Seas Marine Protected Areas (HSMPAs). For each area of interest, the report reviews habitat characteristics, global distribution, associated fauna, exploitation value, biodiversity issues and potential / actual threats. Based on these reviews, a number of recommendations are presented regarding the need for protection and potential HSMPA status.

HYDROTHERMAL VENTS
- At present, the scientific community appears to pose the greatest threat, but has already initiated an ‘in-house’ protection plan. Such efforts should be encouraged and augmented by international governmental and NGO input.
- The ephemeral nature of hydrothermal vent communities suggests the need to ‘protect’ relatively large areas of mid-ocean ridge, perhaps a ridge segment at a time to ensure the long-term ‘survival’ of these communities within particular geographic areas.

SEAMOUNTS
- Seamount biological communities are already under considerable threat and should be seen as an URGENT and appropriate case for HSMPA designation.
- The widely distributed nature of seamounts, and their role as ‘biological islands’ and ‘stepping stones’ requires special attention, and particularly suggests the need for an HSMPA network in this case.

DEEP-SEA TRENCHES
- (If present in high seas areas) Trenches are presently at relatively minimal threat and have comparatively low levels of ‘interest’; consequently there is little HSMPA need / potential at present.
This conclusion should be kept under review, particularly with regard to their potential as dumpsites.

DEEP-SEA ‘CORAL REEFS’
- Extensive destruction of deep-sea coral communities is already evident, and has probably occurred for the last 100 years; protection of these important habitats is therefore urgently needed.
- Any protected area designation should be co-ordinated with existing inshore legislation / protected areas (e.g. European Union Habitats Directive, and Norwegian trawling exclusion areas).

POLYMETALLIC NODULES
- Deep-sea manganese nodule mining has been long suggested, but is not economically viable and unlikely to become so for decades, threat is consequently minimal at present.
- The need for HSMPA designation is questionable, and certainly of a low priority only; any HSMPA action should be co-ordinated with the International Seabed Authority.

COLD SEEPS AND POCKMARKS
- Though less ‘publicised’, cold seep communities should certainly warrant the same conservation value as hydrothermal vent communities. However, their occurrence in the deep sea is less well known and less ‘predictable’ than is the case with hydrothermal vents, consequently the selection of appropriate sites / areas may be problematic.
- Cold seeps and pockmarks are of common occurrence in shallow water (e.g. North Sea), any HSMPA action should be linked with related shallow seas initiatives.

GAS HYDRATES
- There is currently insufficient information on biological communities that may be associated with gas hydrates to warrant their separate consideration as HSMPAs at this time.
- For the present, gas hydrates should be considered jointly with cold seep communities (particularly those fuelled by hydrocarbon escapes).

SUBMARINE CANYONS
- Deep-sea canyons are common and widespread but do have distinct biological significance. The greatest threats to these environments probably lie within EEZs; canyons are nevertheless clear candidates for HSMPA status.
- Given their intimate linkage with the ‘inshore’ environment, successful HSMPA designation will depend on matching ‘inshore’ initiatives.

Part 2: Legal and political considerations

IUCN – The World Conservation Union has long played a leading role in the development and implementation of marine protected areas, particularly through the work of its World Commission on Protected Areas (WCPA). A task forces on High-Seas MPAs, a sub-part of the WCPA, brings together experts on this issue from around the world. Most recently, a resolution was adopted at the Amman World Conservation Congress in October 2000, which calls upon national governments, international agencies and the non-governmental community to better integrate established multilateral agencies and existing legal mechanisms to identify areas of the high-seas suitable for collaborative management action, and to reach agreement by consensus on regimes for their conservation and management. It is within this context that IUCN participated in and supported the work of the recent Vilm Meeting of experts on high-seas MPAs. Drawing from the discussions and conclusions of this Meeting of Experts, this paper explores some of the legal, political and institutional issues relevant to the possible establishment of protected areas on the high-seas.
The main points this paper makes are:

- That in view of the current uncertainty as to the state of exploitation of the living resources of the high-seas and the extent of uses (both current and potential), a precautionary approach to the exploitation of these resources is critical;

- That high-seas marine protected areas may be one of the flexible and focussed tools available that are called for to address this uncertainty;

- That international law should not necessarily be an obstacle or impediment to the establishment of high-seas MPAs (HSMPAs). Rather, in its present form the international legal regime imposes a duty on States to cooperate in managing resources of the high-seas and does not prohibit or preclude the establishment of marine protected areas on the high-seas;

- Under the current regime a single State or group of States that refuses an evolution in international soft or hard law can undermine the efforts of the international community.

- MPA creation is one of the 5 pillars of the Jakarta Mandate of the Convention on Biodiversity. The scope of the CBD extends beyond the limits of national jurisdiction.

- The UN Fish Stocks Agreement, Southern Ocean Whale Sanctuary, the UN Driftnets Agreement and the IMO's system of Particularly Sensitive Seas Areas are examples of how different types of MPAs may be established;

- That States and other entities with an interest in HSMPAs will need to anticipate and overcome a number of political, legal and institutional obstacles that may arise as MPAs are established on the high seas; and

- That in view of this uncertainty it might be sensible to launch an experimental MPA around a seamount where fishing has not yet taken place, building on the existing international legal regime, and through intense cooperation and collaboration among all the States with an interest in high-seas resources.

**WWF recommendations**

WWF calls on States to:

1. acknowledge the wealth of biodiversity and natural resources there are in high-seas areas;

2. identify areas and resources in their region or within which they have some involvement that are in need of protection or management measures;

3. work together to both address the existing and imminent threats to resources on the high-seas, and to give protection to other specific sensitive or vulnerable resources in line with the Precautionary Principle;

4. apply the recommendations of the Convention of Biodiversity, to cooperate between Parties beyond the extent of national jurisdiction, and to establish a system of protected areas where special measures are deemed to be necessary;

5. apply the range of existing international hard and soft law to protect vulnerable high-seas resources;

6. to develop a system which affords especially threatened areas limited interim protection whilst an agreement between States is being negotiated.

*Simon Cripps, WWF-International, Gland, Switzerland (scripps@wwfint.org)*
### TABLE 2: TABULAR SUMMARY OF ENVIRONMENTAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>TYPICAL DEPTH</th>
<th>SCALE</th>
<th>FREQUENCY/EXTENT</th>
<th>TYPICAL DEPTHS</th>
<th>GEOLOGICAL CHARACTERISTIC</th>
<th>BIOLOGICAL CHARACTERISTIC</th>
<th>NATURAL STABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrothermal vents</td>
<td>500–4,000 m</td>
<td>&lt;1 km</td>
<td>100s</td>
<td>Sublittoral to hadal</td>
<td>High temperature fluid escape, tectonic / volcanic</td>
<td>Chemosynthesis, endemism, and enhanced productivity</td>
<td>Ephemeral Fluid flow dependant</td>
</tr>
<tr>
<td>Seamounts</td>
<td>10s-5,000 m (summit depth)</td>
<td>10s-100 km</td>
<td>1,000s</td>
<td>Sublittoral to abyssal</td>
<td>Tectonic / volcanic</td>
<td>Biological 'hot spots', endemism, and enhanced productivity</td>
<td>Variable, possible seismic and volcanic activity</td>
</tr>
<tr>
<td>Deep-sea trenches</td>
<td>6,000-11,000 m</td>
<td>100s-1,000s km</td>
<td>10s</td>
<td>Hadal</td>
<td>Subduction zones</td>
<td>Ultra-extreme environment, endemism</td>
<td>Focal sites for tectonic activity</td>
</tr>
<tr>
<td>Deep-sea reefs</td>
<td>80–1,000 m</td>
<td>&lt;1-10s km</td>
<td>Common</td>
<td>Sublittoral to bathyal</td>
<td>Various settings</td>
<td>Biological 'hot spots', enhanced diversity</td>
<td>Stable</td>
</tr>
<tr>
<td>Manganese nodules</td>
<td>4,000–6,000 m (economic deposits)</td>
<td>100s-1,000s km</td>
<td>Vast fields</td>
<td>Abyssal</td>
<td>Abyssal plains</td>
<td>Enhanced diversity</td>
<td>Stable</td>
</tr>
<tr>
<td>Seeps and pockmarks</td>
<td>10s-6,500 m</td>
<td>&lt;1-10s km</td>
<td>1,000s</td>
<td>Sublittoral to abyssal</td>
<td>'cold' fluid escape, various settings</td>
<td>Chemosynthesis</td>
<td>Ephemeral Fluid flow dependant</td>
</tr>
<tr>
<td>Gas hydrates</td>
<td>&gt;300 m</td>
<td>&lt;1-100s km</td>
<td>Vast resource</td>
<td>Bathyal to abyssal</td>
<td>Frozen methane</td>
<td>Chemosynthesis</td>
<td>Stable ?, potentially subject to catastrophic outgassing</td>
</tr>
<tr>
<td>Submarine canyons</td>
<td>10s-3,500 m</td>
<td>10s-100s km</td>
<td>Common</td>
<td>Bathyal to abyssal</td>
<td>Continental slopes</td>
<td>Biological 'hot spots', enhanced productivity</td>
<td>Variable, may be subject to frequent or catastrophic natural disturbance (i.e. downslope sediment transport)</td>
</tr>
<tr>
<td>Seabirds</td>
<td>Na</td>
<td>Na</td>
<td>Na</td>
<td>Epipelagic</td>
<td>Na</td>
<td>Breeding and feeding areas</td>
<td>Na</td>
</tr>
<tr>
<td>Cetaceans</td>
<td>Na</td>
<td>Na</td>
<td>Na</td>
<td>Epipelagic to bathypelagic</td>
<td>Na</td>
<td>Migration routes, breeding and feeding areas</td>
<td>Na</td>
</tr>
<tr>
<td>Transboundary fish stocks</td>
<td>Na</td>
<td>Na</td>
<td>Na</td>
<td>Epipelagic to bathypelagic</td>
<td>Na</td>
<td>&lt;?&gt;</td>
<td>&lt;?&gt;</td>
</tr>
</tbody>
</table>
## TABLE 3: TABULAR SUMMARY OF SCIENTIFIC, SOCIETAL AND COMMERCIAL INTERESTS AND THEIR THREATS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SCIENTIFIC 'INTEREST'</th>
<th>SOCIETAL 'AWARENESS'</th>
<th>COMMERCIAL 'POTENTIAL'</th>
<th>MAIN PRESENT THREATS</th>
<th>POTENTIAL THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrothermal vents</td>
<td>High for geology and biology</td>
<td>Quite high</td>
<td>Considerable</td>
<td>Scientific (tourism)</td>
<td>Mineral and energy extraction</td>
</tr>
<tr>
<td>Seamounts</td>
<td>High biological interest</td>
<td>Possibly moderate</td>
<td>Considerable</td>
<td>Fishing</td>
<td>Mineral extraction</td>
</tr>
<tr>
<td>Deep-sea trenches</td>
<td>Potentially high, but technology limited</td>
<td>Limited</td>
<td>Limited / moderate</td>
<td>(nil, pollution)</td>
<td>Waste disposal</td>
</tr>
<tr>
<td>Seamounts</td>
<td>High for geology and biology</td>
<td>Becoming high</td>
<td>Considerable</td>
<td>Fishing</td>
<td>(adjacent industry)</td>
</tr>
<tr>
<td>Manganese nodules</td>
<td>Moderate, linked to potential exploitation</td>
<td>Limited</td>
<td>Considerable</td>
<td>(nil, trial mining)</td>
<td>Mineral extraction</td>
</tr>
<tr>
<td>Seeps and pockmarks</td>
<td>High for geology and biology</td>
<td>Limited</td>
<td>Considerable</td>
<td>(nil, oil and gas exploration)</td>
<td>Mineral extraction</td>
</tr>
<tr>
<td>Gas hydrates</td>
<td>High for geology, potentially high for biology if novel communities located</td>
<td>Very limited</td>
<td>Considerable</td>
<td>(nil, oil and gas exploration)</td>
<td>Mineral extraction</td>
</tr>
<tr>
<td>Seamounts</td>
<td>High for geology and biology</td>
<td>Possibly moderate</td>
<td>Moderate / considerable</td>
<td>Fishing (pollution)</td>
<td>Waste disposal (adjacent industry)</td>
</tr>
<tr>
<td>Submarine canyons</td>
<td>High for geology and biology</td>
<td>High</td>
<td>Limited</td>
<td>Fishing</td>
<td>(adjacent industry)</td>
</tr>
<tr>
<td>Cetaceans</td>
<td>High</td>
<td>Moderate</td>
<td>By-catch and whaling</td>
<td>(adjacent industry)</td>
<td></td>
</tr>
<tr>
<td>Transboundary fish stocks</td>
<td>High</td>
<td>Considerable</td>
<td>Fishing</td>
<td>(adjacent industry)</td>
<td></td>
</tr>
</tbody>
</table>
Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: over 900 members in all, spread across some 138 countries.

The World Conservation Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

WWF is the world’s largest and most experienced independent conservation organisation with over 4.7 Million supporters and a global network active in 96 countries.

WWF’s mission is to stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature, by:
- conserving the world’s biological diversity
- ensuring that the use of renewable natural resources is sustainable
- promoting the reduction of pollution and wasteful consumption.
Protect the High Seas before its too late, Governments urged

Gland, Switzerland - Urgent measures are needed to protect the vast hidden treasures of the deep seas from over-exploitation, according to a new report by WWF, the conservation organization, and IUCN, the World Conservation Union.

The report, *The Status of Natural Resources on the High Seas*, says that the deep sea, and the creatures that live within it, are threatened by unregulated fishing and oil exploration, CO2 dumping, biotechnology, and the exploitation of gas hydrates and hydrothermal vent heat. Particularly threatened are deep-sea corals in the Atlantic which have been damaged by industrialized fishing trawlers which drag heavy chains over reefs, the orange roughy fish in the South Pacific and Indian Ocean, whales, dolphins and porpoises. The report calls for international agreements to be put in place to regulate the management, protection and exploitation of high seas beyond the 200 nautical-mile limit of the exclusive economic zones (EEZ) of coastal states.

"Increasing levels of fishing and oil exploration are harming the fragile biodiversity of the deep seas," said Dr. Simon Cripps, Head of WWF's Marine Programme. "Being open to unregulated access has made the high seas increasingly susceptible to over-exploitation. The enhanced capacity and reach of fishing fleets, and advanced technologies that can enable oil drilling to take place up to depths of at least 2,000 metres, put the sensitive marine life of the high seas at great risk."

About half of the Earth's surface is covered by high seas that are outside national jurisdiction. Within them exists marine life that is rich in diversity as well as scientific and geologically significant deep-sea coral reefs, seamounts, deep-sea trenches and fish stocks. The WWF/IUCN report, written by specialists from the Southampton Oceanography Centre in the United Kingdom and Dr. Charlotte de Fontaubert, calls on states to assess the magnitude of these resources, the threats to them, their potential for sustainable use and action to protect biodiversity.

The IUCN's Amman World Conservation Congress in October 2000 urged governments, international agencies and NGOs to review existing legal agreements and to identify areas of the high seas suitable for collaborative management, and to agree on ways to manage and conserve them. Part of the solution, says the report, could be the designation of different types of High-Seas Marine Protected Areas (HSMPAs) to address the uncertainty of exploitation of their living resources. Some elements of international agreements already require states to cooperate in managing resources of the high seas. What governments and international conservation organisations need to do is go a step further and take urgent action to overcome political, legal and institutional obstacles to practical implementation of activities to protect the high seas.

"Technology is advancing at such a pace that by the time that we know the value of a resource, it may be gone. We have to plan now for the conservation and sustainable, equitable uses of marine resources in areas outside national jurisdiction," said John Waugh, Senior Multilateral Relations Officer, IUCN.

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This press release and associated material can be found on www.panda.org
Scientific names:

Orange roughy fish - *Hoplostethus atlanticus*