

Options for managing human threats to high seas biodiversity: Summary

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O'Leary BC, Hoppit G, Townley A, Allen HL, McIntyre CJ, Roberts CM (2020) Options for managing human threats to high seas biodiversity. *Ocean and Coastal Management* 187:105110 doi: 10.1016/j.ocecoaman.2020.105110

The high seas covers 61% of the world's oceans and are the least regulated and protected place on the planet. Countries are now negotiating the terms of a new high seas international legally binding instrument (high seas treaty) aimed at improving management of this region. We identified five key human activities and threats that affect the high seas and explored management options available to mitigate their impacts. The top ranked threats are: overfishing, shipping, deep sea mining, climate change and land-based pollution. Area-based management tools, including marine protected areas, were the only consistently effective option to mitigate impacts across overfishing, shipping and deep sea mining, and can partially address problems from climate change. A new high seas treaty could help unify management options and actors to conserve marine biodiversity and ensure sustainable use. Incorporating a mechanism to establish marine protected areas and other effective area-based management tools will help secure biodiversity protection and deliver multiple objectives based on the ecosystem approach.

Areas beyond national jurisdiction (ABNJ) constitute international waters outside the 200 nautical mile limits of national jurisdiction, cover 61% of the world's oceans and are governed under the United Nations Convention on the Law of the Sea (UNCLOS). Colloquially, ABNJ are often referred to as the 'high seas'.

Existing sector-focussed management organisations have largely failed to protect biodiversity in the high seas given their narrow remits, governance gaps and limited coordination and cooperation, and inherent difficulties in managing human activities across a global commons. These limitations have led to steep loss of ocean life, resulting in international negotiations to develop an international legally binding instrument for the conservation and sustainable use of biodiversity beyond national jurisdiction under UNCLOS. Four elements frame the UN negotiations: marine genetic resources, including benefit sharing; area-based management tools (ABMTs), including Marine Protected Areas (MPAs); environmental impact assessments; and capacity building and the transfer of marine technology.

To inform ongoing UN negotiations and identify high seas governance challenges and opportunities in ABNJ, we sought to answer the following key questions: What human activities and influences affect the high seas and to what degree? What measures are available to mitigate the impacts arising from those with the greatest pervasiveness, potential for impact and probability of emergence? How effective are these measures?

We identified eleven activities and influences as having the potential to affect marine ecosystems within ABNJ (Box 1). We assessed the pervasiveness or extent to which each of these currently cover ABNJ, their potential for impact at different scales (local, regional and global) and their probability of emergence (within the next decade or two) on a three-point scale broadly corresponding to high, moderate and low. Five influences scored highly across all three categories fishing/hunting; maritime shipping; climate change and its associated effects; land-based pollution; and mineral exploitation.

We then evaluated management options to address these threats. Options are diverse and available through a variety of actors, although their actions are not always effective. Area-based protection was the

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Box 1: Assessment of the pervasiveness, potential for impact and probability of emergence of eleven human activities and influences in ABNJ.

Activity/influence	Pervasiveness	Potential for impact	Probability of emergence
Fishing/hunting*	Red	Red	Red
Maritime shipping*	Red	Red	Red
Climate change & associated effects*	Red	Red	Red
Land-based pollution*	Red	Red	Red
Deep-sea mineral exploration & exploitation*	Red	Red	Red
Oil & gas exploration & exploitation	Amber	Red	Amber
Bioprospecting for marine genetic resources & scientific research	Amber	Amber	Amber
Aquaculture	Amber	White	Amber
Renewable energy	Amber	White	Amber
Military	White	White	White
Submarine cables/pipelines	Amber	Amber	Amber

Colours represent assessment results based on a three-point scale broadly corresponding to high (red), moderate (amber) and low (beige). Where an assessment was not possible, cells are not shaded.

* indicates those activities/influences considered to have the greatest potential and probability of adverse environmental effects in the high seas and therefore subject to greater evaluation of the potential for management measures to mitigate effects.

Note that prospective activities such as offshore server farms, rocket launches, and ocean cleanup projects/devices may become increasingly relevant and this table should be considered a live assessment.

only effective option consistently identified to mitigate impacts across these high-ranked activities and influences, except for land-based pollution which will require national action to control sources. MPAs also offer only a partial solution for climate change.

Existing organisations tasked with managing specific human activities in ABNJ can already designate sectoral area-based protection, but these tools typically address only specific threats. Comprehensive management of an area is presently only possible through cross-sectoral international agreement and requires effective enforcement mechanisms and complete membership to be worthwhile. Discussions for a new international legally binding instrument for ABNJ are currently considering the role ABMTs, including marine protected areas (MPAs), might play in future high seas management. To tackle the integrated management issues of the 21st century, **the new instrument should enable creation of highly and fully protected MPAs to safeguard vulnerable habitats and wildlife and promote ecosystem resilience. This means adopting an agreement that covers all marine species, including fish, regardless of their commercial status or life history.**

Given the fluid nature of the marine environment, and the long-distance movements of many of the creatures that live in ABNJ, we conclude that MPAs should form the foundation of management but sectoral protection measures such as fisheries restrictions are essential as well. **Developing a high seas network of MPAs will require global coordination to produce a cost-effective, transparent network design that blends top down strategic conservation planning with bottom up site nomination based on local knowledge and stakeholder interests. None of the regional bodies that exist at the moment is a candidate to lead this effort, and nor would a devolved process be likely to work, given the limited mandates and poor historical track record of existing management organisations.**

To be effective, the new treaty must clearly define roles, responsibilities and hierarchies of existing and new organisations, enhance intra- and cross-sectoral cooperation and coordination, emphasise responsibility and liability for environmental damage in ABNJ, and ensure the implementation of a precautionary ecosystem approach to sustainably manage marine resources.