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BLOOMBERG PHILANTHROPIES OCEAN INITIATIVE

OFB OFFICE FRANÇAIS DE LA BIODIVERSITÉ

SciencesPo

Assessing the management costs of future high seas marine protected areas: an initial methodological approach

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Adopted in 2023, the Agreement on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Treaty) establishes a framework for creating area-based management tools (ABMTs), including marine protected areas (MPAs). The process includes the submission of MPA proposals by one or several States Parties, an evaluation by a Scientific and Technical Body (STB), a consultation phase and a formal adoption that can be done by a ¾ majority vote. While the required 60 ratifications for the treaty to enter into force are still pending, some States and stakeholders are anticipating implementation challenges and are preparing proposals for high seas MPAs (HSMPAs). In this context, questions regarding their costs arise.

This *Issue Brief* provides an initial methodological approach for considering the management costs of future HSMPAs, focusing on factors that may influence–either increase or decrease–their amount and/or their distribution. Offering preliminary insights that forthcoming publications will refine and expand upon, it illustrates that the management costs of future HSMPAs will be significantly influenced by the institutional choices States will make and highlights options for managing, reducing and/or sharing budget items.

KEY MESSAGES

The costs associated with MPA management can generally be divided into four main categories: administration and oversight; monitoring, control, and surveillance (MCS); scientific activities; and education and outreach.

Various factors can influence the management costs of future HSMPAs. For each of the categories presented below, different scenarios exist, each with distinct financial implications.

There are opportunities to manage, reduce and share costs, particularly for administration and oversight, as well as MCS, which are usually the most significant budget items.

The costs will also depend on the choices made by States regarding the governance model (i.e. cooperative, centralized or decentralized governance), conservation objectives and zoning of future HSMPAs–strictly protected MPAs being generally less costly to manage than multi-purpose MPAs.

States and other stakeholders involved in the preparation of MPAs must anticipate these issues and identify, according to the characteristics of each site, the most desirable budgetary options for optimizing and sharing costs.

ISSUEBRIEF

N° 09
OCTOBER
2024

INTRODUCTION

Since the adoption of the BBNJ Treaty in 2023, there has been a global momentum to achieve the 60 ratifications required for it to enter into force. Meanwhile, some States and other stakeholders are anticipating the implementation challenges of the treaty and are preparing proposals for the first HSMPAs.[1] Several initiatives are currently underway across various marine regions and are anticipated to be further strengthened and expanded, driven by the increasing momentum to accelerate progress toward achieving the 30x30 target.[2]

While some concerns and questions remain regarding the costs of establishing future HSMPAs, particularly in light of the pending entry into force of the treaty and operationalization of its financial mechanism, these concerns are increasingly offset by growing momentum to accelerate the establishment of such areas in order to meet global conservation objectives. Numerous stakeholders–including champion States, non-governmental organizations (NGOs), intergovernmental organizations, and both private and public funders–are actively supporting initiatives aimed at advancing the scientific research, technical expertise, advocacy, capacity building, and thought leadership necessary to develop and implement the first generation of HSMPA proposals.

However, to be effective, future HSMPAs will require long-term sustainable financing, and the question of their ongoing management costs inevitably arises. This is a complex issue for States, given the limited experience with HSMPAs and the fact that insights from the extensive literature on coastal MPA costs are not fully applicable to HSMPAs, due to the unique characteristics and challenges of these areas.

Against this background, this *Issue Brief* aims to provide stakeholders who consider creating HSMPAs with an initial methodological approach to anticipate their management costs. It does not propose specific figures but identifies the main categories of MPA management costs (2) and highlights the various factors that will influence the costs of future HSMPAs and their distribution (3), before suggesting next steps and offering recommendations (4). This work provides initial insights that forthcoming publications will expand on, with a focus on site-specific analyses and the exploration of further opportunities to optimize and share costs.

1 For ease of reading, this document will use the term "High Seas MPAs" to designate these areas, which can be established both on the high seas, i.e. the water column beyond the exclusive economic zones, and on the seabed beyond the continental shelves of coastal States, formally known as "the Area".

2 This target calls for the conservation of 30% of the earth's land and sea through the establishment of protected areas and other area-based conservation measures.

1. MAIN CATEGORIES OF MANAGEMENT COSTS FOR MPAs

Budgets of MPAs established under national jurisdictions come in different formats, with more or less detailed budget lines. The literature, both scientific and grey, also categorizes the budget items in multiple ways. However, the management costs associated with MPAs can generally be divided into four main categories: administration and oversight (2.1), monitoring, control and surveillance (2.2), scientific activities (2.3) and education and outreach (2.4).

1.1. Administration and oversight

For an MPA to function effectively and reach its conservation objectives, a dedicated authority responsible for the administration and general oversight of the area must supervise its management. The operating costs associated with this management body are diverse, with salaries representing the most significant expense.[3] While staffing levels generally increase with the size of an MPA, particularly in small- to medium-sized areas, this trend is not always observed in large MPAs:[4] factors such as remoteness, budget constraints, and specific management strategies significantly influence staffing levels.[5] Other administrative and management costs include e.g. the maintenance of buildings and equipment, travel expenses, consultancies, boundary demarcation or legal fees related to prosecution.[6]

1.2. Monitoring, control and surveillance

Ensuring effective monitoring, control, and surveillance (MCS) of human activities is essential for the successful implementation of MPA management plans. MCS involves a broad spectrum of tools, technologies, and policies designed to promote compliance, enhance transparency, collect and collate the data to demonstrate the MPAs' efficacy and contribute to the conservation and sustainable use of marine resources.[7] The associated costs of MCS include, for example, the acquisition, maintenance, or chartering of vessels and aircrafts, access to and development of capabilities for emerging technologies such as information

3 UNEP (2022). MPA Finance – Status and Future Directions. Discussion Paper. Nairobi, Kenya; Binet, T., Diazabakana, A., Hernandez, S. (2015). Sustainable financing of Marine Protected Areas in the Mediterranean: a financial analysis. Vertigo Lab, MedPAN, RAC/SPA, WWF Mediterranean.

4 Balmford, A., Gravestock P., Hockley N., McClean C.J., Roberts C.M. (2004). The worldwide costs of marine protected areas. *PNAS* 101, 9694–9697.

5 Walsh, M., Barr, R and Sundberg. C. (2021). Funding the Big Blue: Offshore and High Seas Marine Protected Area Finance. Prepared for The Pew Charitable Trusts.

6 Binet, T. *et al.* (2015). Sustainable financing of Marine Protected Areas in the Mediterranean: a financial analysis. Vertigo Lab, MedPAN, RAC/SPA, WWF Mediterranean; Ban, N., Adams, V., Pressey, R.L. & Hicks, J. (2011). Promise and problems for estimating management costs of marine protected areas, *Conservation Letters*, 4, 241-252.

7 Cremers, K., Wright, G., Rochette, J., (2020). Strengthening monitoring, control and surveillance of human activities in marine areas beyond national jurisdiction: Challenges and opportunities for an international legally binding instrument, *Marine Policy,* Volume 122.

technology systems, drones, MCS centres, or the engagement of private companies.[8] While the proportion of the budget dedicated to MCS may decrease slightly after the initial investment (e.g. vessel acquisition), it remains a significant maintenance expense for an MPA. According to UNEP, "experience and anecdotal evidence suggest that surveillance and patrols are often the most costly MPA activities, sometimes accounting for as much as 50% or more of total MPA costs".[9]

1.3. Scientific activities

Science is not only fundamental to the establishment of MPAs–through baseline studies, the identification of conservation needs, and the development of guidelines–but also critical to their ongoing management. Regular scientific studies assess the health of the ecosystem and evaluate the achievement of conservation objectives. These studies also provide decision-makers with the tools needed for adaptive management of the area. In some MPAs, science serves as a platform for developing multi-stakeholder partnerships, including those with Indigenous Peoples and Local Communities (IPLCs).[10]

1.4. Education and outreach

Education and outreach in the context of MPAs involves engaging and informing the public, stakeholders, and policymakers about the importance, benefits, constraints, and management of these protected areas. Investing in these activities improves "the knowledge and effective engagement of the multiple stakeholders (…), the environmental goods and services it provides, and the social and economic benefits it generates."[11] This process is crucial for building and maintaining public support, ensuring compliance with regulations, and fostering a sense of shared responsibility for marine ecosystem conservation. MPAs should therefore ensure that "they properly invest in outreach and communication to help retain political support, which includes community outreach to the extent that public perceptions may influence government decisions."[12] Associated costs include, for instance, stakeholder engagement activities and public awareness campaigns.

8 Cremers, K., Oliveira Pinto, A., Okoth-Menya, F., Rochette, J. (2024). Monitoring, control and surveillance of future high seas MPAs: what role for emerging technologies? IDDRI, *Study* N°0624.

9 UNEP (2022). MPA Finance – Status and Future Directions. Discussion Paper. Nairobi, Kenya.

10 Kekuewa Kikiloi *et al.* (2017). Papahānaumokuākea: Integrating Culture in the Design and Management of One of the World's Largest Marine Protected Areas. Coastal Management, 45, 436–51.

11 MAATE (2023). Hermandad Marine Reserve Management Plan. Ministry of Environment, Water, and Ecological Transition. Galapagos National Park Directorate. Sub-secretariat of Natural Heritage. Jocotoco Conservation Foundation. Biogennia Cía. Ltda.

12 Bohorquez, J. J., Dvarskas, A., Jacquet, J., Sumaila, U. R., Nye, J., & Pikitch, E. K. (2022). A New Tool to Evaluate, Improve, and Sustain Marine Protected Area Financing Built on a Comprehensive Review of Finance Sources and Instruments. *Frontiers in Marine Science*, 8, 742846.

2. FACTORS INFLUENCING MANAGEMENT COSTS OF FUTURE HIGH SEAS MPAs AND THEIR DISTRIBUTION

For each cost category highlighted above, the following section identifies the key factors that will determine costs for future HSMPAs and their distribution.

2.1. Administration and oversight

In terms of administration and oversight, costs will primarily depend on the governance structure of future HSMPAs. At least three scenarios can be considered:

- **Cooperative governance**: this scenario involves cooperation and coordination between existing organizations without the establishment of dedicated management bodies. This model has already been partially implemented for HSMPAs established in the Southern Ocean (CCAMLR) and the North-East Atlantic (OSPAR).
- **Centralized governance**: this approach would involve the creation of a single global body responsible for all HSMPAs, potentially under the BBNJ Secretariat. A variation of this option could involve setting up "regional hubs" with the mandate to manage HSMPAs in specific marine regions.
- **Decentralized governance**: this scenario envisions the establishment of one management body per MPA, similar to the approach taken for MPAs under national jurisdiction.

Each of these scenarios will have different implications for administration and oversight costs. While the latter two scenarios may appear more costly at first glance, there are options for reducing and/or sharing these expenses:

- **Staffing**: personnel can be internationally recruited through the UN system and the BBNJ treaty financial mechanism and/or seconded from national administrations. This is a common practice in the international arena that can reduce the financial burden of salaries on intergovernmental organizations.
- **Office structures**: dedicated offices can be established for the potential management authorities, or staff can be hosted by an existing organization (such as intergovernmental bodies or national administrations), thereby limiting structural costs.

2.2. MCS

Over the last decade, there has been a rapid increase and spread of innovative MCS technologies, driven by decreasing satellite technology costs, open access to satellites, and greater investment in artificial intelligence, big data solutions, cloud computing, and skilled human resources. These technologies can facilitate the implementation of future HSMPA

management plans.[13] However, several factors will influence the cost of MCS activities for future HSMPAs and their distribution, including:

- **Use of private companies**: some national administrations and intergovernmental organizations, particularly Regional Fisheries Management Organizations (RFMOs), regularly engage private companies for MCS activities. These companies offer a variety of tools, often integrating different data sources, tailored to meet the specific needs of their clients. While these tools could benefit the management of future MPAs, they come with financial costs.
- **Support from non-profit organizations**: non-profit organizations are playing an increasingly significant role in MCS activities. They assist States by facilitating access to data, providing capacity-building, analyzing MCS needs, addressing enforcement gaps, ensuring transparency, and offering data-based recommendations. Utilizing these organizations for the MCS of future HSMPAs can be a cost-effective option.
- **In-kind contributions from States**: experience shows that innovative MCS technologies cannot completely replace traditional MCS methods, particularly vessel and aircraft patrols, which have a strong deterrent effect.[14] In large and remote MPAs, these activities are often carried out by national authorities (e.g., coast guards, military) due to a lack of suitable logistical resources within the MPA management authorities. The same is likely to apply to future HSMPAs, with experience in the Southern Ocean confirming the need for voluntary contributions from certain States to ensure effective patrols. These particularly costly activities will need to be supported by champion States with the capacity to undertake such control measures as the budget of future HSMPA management authorities will likely not be able to cover them.
- **Zoning of future HSMPAs**: existing MPA experiences illustrate that the costs of MCS activities and thus the overall costs of MPAs are lower in strictly protected areas. The more complex the zoning, the higher the associated MCS costs. MPAs that are 100% no-take generally have lower management costs than multi-purpose MPAs of the same size with 30% no-take zones.[15]

2.3. Scientific activities

Scientific research on the high seas is inherently more expensive than in coastal waters. Several specific factors will influence the costs of scientific activities in future MPAs, including:

- **Level of ambition**: scientific activities may range from basic monitoring of conservation objectives to more comprehensive research efforts.
- **Research methods**: costly scientific expeditions can be supplemented or replaced by remote sensing and innovative data collection techniques.[16]
- **Coordination with existing organizations**: collaborating with relevant intergovernmental organizations in the area where the HSMPA is established will be crucial in reducing and sharing the costs of scientific monitoring.
- **Collaboration with the private sector**, e.g. fishing industry or cruise ships.

2.4. Education and outreach

For future HSMPAs, education and outreach activities are likely to be much more limited than in coastal MPAs, where stakeholders and conflicts of use are more numerous. Their scope will depend on the specific needs of each site based on the level of intensity of human activities in the area, and therefore the number of stakeholders impacted by the HSMPA.

3. CONCLUSION

Preparing proposals for HSMPAs will inevitably require consideration of their costs, and also their long-term financing. Failure to adequately prepare for management costs of a HSMPA could jeopardize its effectiveness and even credibility. It is in the interest of all stakeholders working on prospective HSMPAs to consider the issue of costs from an early stage, as part of the planning process, rather than as an afterthought. This *Issue Brief* demonstrates that various factors will influence management costs and their distribution as summarized in **Table 1**. Some factors will depend on collective decisions, such as governance structures, conservation objectives and zoning, while others will revolve around individual choices, such as voluntary contributions by countries for MCS or staffing. This *Issue Brief* invites States and other non-State actors involved in preparing HSMPAs to anticipate these issues and identify, based on the characteristics of each site (e.g. type and extent of human activities, existence of competent intergovernmental organizations, champion States), the most desirable budgetary options for optimizing and sharing costs.

13 Cremers, K., Oliveira Pinto, A., Okoth-Menya, F., Rochette, J. (2024). Monitoring, control and surveillance of future high seas MPAs: what role for emerging technologies? IDDRI, *Study* N°0624.

14 *Ibid.*

15 Ban, N. *et al.* (2011). Promise and problems for estimating management costs of marine protected area. *Conservation Letters*, Vol. 4/3, 241-252.

16 Freestone, D. *et al.* (2024). High seas in the cloud: the role of big data and artificial intelligence in support of high seas governance – The Sargasso Sea pilot. *Frontiers in Marine Science*, 11.

TABLE 1. Cost categories and factors influencing management costs and/or their distribution

Cost categories	Factors influencing management costs and/or their distribution
Administration and oversight	Governance structures of HSMPAs: 1) cooperative 2) centralized or 3) decentralized governance
	Source of staff: internationally recruited vs seconded
	Office structures: dedicated office vs hosted by an existing organization
MCS	Use of private MCS companies
	Support from non-profit organizations
	In-kind contribution from States
	Zoning: no-take vs multi-purpose MPAs
Scientific activities	Level of ambition: basic monitoring of conservation objectives vs comprehensive research efforts
	Research methods: scientific expeditions vs innovative data collection techniques
	Coordination with relevant intergovernmental organizations
	Collaboration with the private sector
Education and outreach	Level of needs and ambition, in light of the intensity of use in the area

Rochette, J., Cremers K., Oliveira Pinto, A., Okoth-Menya, F., Ruston, L. Assessing the management costs of future high seas marine protected areas: an initial methodological approach. IDDRI, *Issue Brief* N°09/24

The authors would like to thank the experts who kindly accepted to be interviewed. Special thanks go to the participants of the September 2024 IUCN Workshop in Gland, Thomas Binet (BlueSeeds), Jean-Baptiste Marre (consultant), Anna Metaxas (Dalhousie University) and Mike Walker (consultant) for providing comments on earlier versions of this paper.

This work has been co-funded by Bloomberg Philanthropies Ocean Initiative, the French Biodiversity Agency and the French government in the framework of the programme "Investissements d'avenir" managed by ANR (French National Research Agency), under the reference ANR-10-LABX-14-01.

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