Government Offices of Sweden
Ministry of the Environment

Strategy for designing and implementing area-based management tools including MPAs under the future BBNJ Agreement

Abstract

Initial Contributors: ***Kristina Gjerde, Jesse Cleary, Guillermo Ortuño Crespo, Daniel Dunn, Aurélie Spadone and Patrick Halpin***

States are in the final stages of negotiating a new United Nations agreement for marine biodiversity in areas beyond national jurisdiction (BBNJ Agreement) under the UN Convention on the Law of the Sea (UNCLOS). A key objective of the BBNJ Agreement is to advance cooperation and coordination in the use of area-based management tools (ABMTs) including marine protected areas (MPAs) towards the conservation and sustainable management of biodiversity in areas beyond national jurisdiction (ABNJ). IUCN, the Duke University Marine Geospatial Ecology Lab, University of Queensland and Stockholm Resilience Centre have compiled key components of a strategy for designing and implementing ABMTs including MPAs under the future BBNJ Agreement. The strategy focuses on how we can build upon what currently exists as well as what is needed to advance the science, data management and capacity to inform the creation of a coherent network of MPAs and other spatial and temporal management measures that is capable of adapting its response based on a combination of knowledge availability, probability of adverse impact risk, and climate change impacts. The strategy also identifies science priorities for getting the data, information and models necessary to support the development of a coherent network of MPAs and other ABMTs in ABNJ.

While there is still much work to be done, it is hoped that this draft strategy will provide an entry point for developing a broader multi-partner strategy that contributes to the UN Decade of Ocean Science as part of an international collaborative project to advance understanding of marine biodiversity and the impacts of climate-related changes, and accelerate the development of new management tools in ABNJ.

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List of acronyms and key terms

ABMT - Area-based Management Tool
ABNJ - Areas Beyond National Jurisdiction
APEIs - Areas of Particular Environmental Interest or APEIs)
BBNJ - Biodiversity Beyond National Jurisdiction
CCAMLR - Commission for the Conservation of Antarctic Marine Living Resources
CLHM - Clearinghouse Mechanism
COP - Conference of Parties
CBD - Convention on Biological Diversity
CMS - Convention on Migratory Species
DOSI - Deep Ocean Stewardship Initiative
EBSA - Ecologically or Biologically Significant Area
EEZ - Exclusive Economic Zone
EIA - Environmental Impact Assessment
FAO- Food and Agriculture Organization
GOBI - Global Ocean Biodiversity Initiative
IBA - BirdLife's Important Bird and Biodiversity Areas
IMMA - Important Marine Mammal Area
IMO - International Maritime Organisation
IPCC - Intergovernmental Panel on Climate Change
IPBES - Intergovernmental Panel on Biodiversity and Ecosystem Services
IOC - UNESCO Intergovernmental Oceanographic Commission
IOI - International Ocean Institute
ISA - International Seabed Authority
MICO - Migratory Connectivity of the Oceans
MPA - Marine Protected Area
OBIS - Ocean Biogeographic Information System
OSPAR - Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)
PSSA - Particularly Sensitive Sea Areas
REMP - Regional Environmental Management Plan
RFMO - Regional Fisheries Management Organisation
SEAs - Strategic Environmental Assessments
UNCLOS - United Nations Convention on the Law of the Sea (1982)
UNFSA - United Nations Fish Stocks Agreement
UN Ocean Decade - UN Decade of Ocean Science for Sustainable Development (2021-2030)
VME - Vulnerable Marine Ecosystem
WCPA - World Commission on Protected Areas

Part I: Introduction

States are in the final stages of negotiating a new United Nations agreement for marine biodiversity in areas beyond national jurisdiction (BBNJ Agreement) under the UN Convention on the Law of the Sea (UNCLOS). A key objective of the BBNJ Agreement is to advance cooperation and coordination in the use of area-based management tools (ABMTs) including marine protected areas (MPAs). MPAs are here defined as designated areas managed for long term conservation of nature and associated ecosystem services; other ABMTs may have a range of objectives and time-frames and could target sector-specific threats or foster a more comprehensive and integrated ecosystem-approach to conservation and management.

The BBNJ Agreement offers a unique opportunity to address ABMTs from a global and cross-sectoral perspective. This global overarching view requires a systematic process that can safeguard global ocean biodiversity and ecosystem functions across a range of scales both spatial and temporal. A global systematic approach can also complement regional processes that might be unable to embrace large scale ecological or oceanographic processes including connectivity generated by migratory species or ocean gyres, or the greater than 25,000 transboundary species in the ocean. In addition, a global approach can "connect the dots" between the various regional organizations and initiatives already underway, while ensuring that key places and pieces do not get left behind.

The objective of this Report is to identify key components of a strategy for implementing ABMTs including MPAs under the future BBNJ Agreement. The strategy builds on what currently exists and identifies what is needed (e.g., a systems approach as well as processes to build the science, data management and capacity) to inform the creation of a coherent network of MPAs[1] and other spatial and temporal management measures in the context of a changing ocean.

This report is timely as methods for implementation are important to consider early on as the methods will influence how the system of ABMTs evolves. There is some prior experience to draw upon, and hence many lessons that can be learned, including from the processes developed under the Convention on Biological Diversity (CBD) for describing ecologically or biologically significant areas (EBSAs), other sets of species-specific criteria, current sectoral

[1] An MPA network can be defined as "a collection of individual MPAs or reserves operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve". IUCN World Commission on Protected Areas (IUCN-WCPA) (2008). Establishing Marine Protected Area Networks—Making It Happen. Washington, D.C.: IUCN-WCPA, National Oceanic and Atmospheric Administration and The Nature Conservancy. 118 p. https://www.iucn.org/sites/dev/files/import/downloads/mpanetworksmakingithappen_en.pdf

approaches, existing regional MPAs, systematic conservation planning (based on global systematic conservation prioritization software), and marine spatial planning, amongst others.

While the BBNJ Agreement includes as draft objectives[2] both a **comprehensive system of area-based management tools, including marine protected areas, and a system of ecologically representative marine protected areas that are connected, it also** envisages MPAs and other ABMTs for very site-specific reasons. What is clear already is that knowledge gaps across vast areas in the high seas and deep seabed beyond national jurisdiction will require the consideration of multiple approaches for identifying and designating ABMTs to achieve the full range of objectives of the BBNJ Agreement.

Thus this strategy briefly summarizes the two existing approaches: i) a site-by-site approach to MPAs and ii) a sector-by-sector approach to ABMTs; however the main **focus is on: iii) a global systems approach to networks of MPAs and other ABMTs to advance the full range of objectives and criteria** in the BBNJ Agreement.[3] As the international community

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[2] Objectives set forth in draft BBNJ Agreement (2019 text) Article 14 [much is still bracketed but basics are agreed - strikethroughs and bold shows most recent additions to revised draft text]]
[(a) Enhance~~ing~~ cooperation and coordination in the use of area-based management tools, including marine protected areas, among States, ~~[existing~~] relevant legal instruments and frameworks and relevant global, regional, subregional and sectoral bodies, which will also promote a holistic and cross-sectoral approach to [ocean management] [conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction];]
[(b) Implementing effectively obligations under the Convention and other ~~existing~~ relevant international obligations and commitments;]
[(~~d~~c) Conserve~~ing~~ and sustainably use~~ing~~ areas requiring protection, including by **establishing a comprehensive system of area-based management tools, including marine protected areas [**under [existing] relevant legal instruments and frameworks and relevant global, regional and sectoral bodies];]
[(~~e~~d) **Establishing a system of ecologically representative marine protected areas that are connected [and effectively and equitably managed];]**
[(~~f~~e) Rehabilitate~~ing~~ and restore~~ing~~ biodiversity and ecosystems, including with a view to enhancing their productivity and health and building resilience to stressors, including those related to climate change, ocean acidification and marine pollution;]
[(~~g~~f) Support~~ing~~ food security and other socioeconomic objectives, including the protection of cultural values;]
[(~~h~~g) Create~~ing~~ scientific reference areas for baseline research;]
[(~~i~~h) Safeguarding aesthetic, natural or wilderness values;]
~~[(j) Establishing a comprehensive system of area-based management tools, including marine protected areas;]~~
[(~~k~~i) Promote~~ing~~ coherence and complementarity;.]

[3] [ANNEX I Indicative criteria for identification of areas]
[(a) Uniqueness;
[(b) Rarity;]
(c) Special importance for the life history stages of species;
(d) Special importance of the species found therein;
(e) The importance for threatened, endangered or declining species or habitats;
(f) Vulnerability, including to climate change and ocean acidification;
(g) Fragility;
(h) Sensitivity;
~~[(i) Biological productivity;]~~
(i) Biological diversity [and productivity];
[(j) Representativeness;]
(k) Dependency;
[(l) Exceptional naturalness;]
[(m) Ecological connectivity [and/or coherence];]
[(n) Important ecological processes occurring therein;]
[(o) Economic and social factors;]
[(p) Cultural factors]

needs to be capable of adapting its response based on a combination of knowledge availability, probability of adverse impact risk, and climate change impacts, the strategy also identifies science priorities for getting the data, information and models needed to do this.

Part II: Key building blocks

A. Players, criteria and approaches currently used to identify important and representative areas

The UN Decade of Ocean Science for Sustainable Development, a ten-year global initiative launched in 2021, provides an "historic opportunity" for all States, intergovernmental organizations, scientists, industry, civil society and others to work together to generate the ocean science needed to support the health and sustainable development of the global ocean.[4]

In terms of decision-making to establish MPAs and adopt ABMTs, the key powers are States acting directly and through international organizations, conventions and agreements for conservation as well as sectoral activities affecting marine biodiversity in ABNJ. However the evidence base to support this work comes from a far wider variety of sources, including other intergovernmental organizations such as UNESCO's Intergovernmental Oceanographic Commission (IOC)[5], the UN Food and Agriculture Organization (FAO) and the UN Environment Programme.

With respect to stressors and values, the UN Regular Process for Global Reporting and Assessment of the State of the Marine Environment includes socio-economic aspects (the First World Ocean Assessment, the second is soon to be released). The UN Group of Experts on the Scientific Aspects of Marine Protection (GESAMP), Intergovernmental Panel on Climate Change (IPCC) as well as the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) contribute important perspectives and special reports.

Also relevant are internal scientific committees such as those that serve regional fisheries management organizations (RFMOs), the Convention on Migratory Species (CMS) and the Commission for the Conservation of Antarctic Living Marine Resources (CCAMLR), scientific

~~[(q) [The adverse impacts of climate change and ocean acidification] [Vulnerability to climate change];]~~
[(q) Cumulative and transboundary impacts;]
(r) Slow recovery and resilience;
(s) Adequacy and viability;
~~(~~t) Replication;
~~(~~u) Feasibility.]

[4] https://www.oceandecade.org/

[5] IOC coordinates several important ocean science related initiatives. In addition to OBIS, these include GOOS, IODE and others, see Part IV. for further information

initiatives such as the Global Ocean Biodiversity Initiative (GOBI) and the Deep Ocean Stewardship Initiative (DOSI), universities and individual scientists, IUCN, NGOs and industry players, indigenous communities and civil society as a whole.[6] A further iteration of this strategy would benefit from the input of many of these players.

Processes and criteria used to describe important areas are many. The best known may be the CBD-led regional expert approach, which applies a set of seven scientific criteria to describe EBSAs in the marine environment. The shorthand for these seven EBSA criteria are:[7]

- Uniqueness or Rarity
- Special importance for life history stages of species
- Importance for threatened, endangered or declining species and/or habitats
- Vulnerability, Fragility, Sensitivity, or Slow recovery
- Biological Productivity
- Biological Diversity
- Naturalness

Since 2010, the CBD Executive Secretary has convened expert workshops in the following regions: Western South Pacific; Wider Caribbean & Western Mid-Atlantic; Southern Indian Ocean; Eastern Tropical & Temperate Pacific; North Pacific; South-Eastern Atlantic; Arctic; North-West Atlantic; Mediterranean Sea; North-East Indian Ocean; North-West Indian Ocean and Adjacent Gulf Areas; Seas of East Asia; Black Sea and Caspian Sea; Baltic Sea; and North-East Atlantic.[8] Discussions are underway at the CBD on how to further evolve this process.

While a large number of the described EBSAs represent existing MPAs in exclusive economic zone (EEZ) waters, a significant number of EBSA areas were described in ABNJ or areas straddling EEZ and ABNJ. The EBSAs described in these expert workshops fell into four

[6] Science and science/policy collaboratives include:
- Global Ocean Biodiversity Initiative (GOBI, David Johnson, et al)
- Migratory Connectivity in the Ocean (MiCO)
- Deep Ocean Stewardship Initiative (DOSI, Diva Amon, Anna Metaxas)
- UNEP WCMC
- WCPA Marine Mammal Task Force,
- WCPA Connectivity Task Force and
- WCPA High Seas MPA Specialist Group,
- GEBCO
- SCOR
- IASS STRONG High Seas project
- Coral Reefs of the High Seas (Daniel Wagner)
- Birdlife International
- Among others

[7] CBD COP Decision IX/20/Marine and coastal biodiversity Annex I.https://www.cbd.int/decision/cop/?id=11663. See also Brochure for the Scientific Criteria and Guidance for Identifying EBSAs and Designing Representative Networks of Marine Protected Areas in Open Ocean Waters and Deep Sea Habitats https://www.cbd.int/doc/meetings/mar/ebsaws-2014-01/other/ebsaws-2014-01-azores-brochure-en.pdf

[8] Background on the EBSA Process https://www.cbd.int/ebsa/about

general categories: (1) Single fixed areas (e.g. a single seamount), (2) Collections of fixed sites (e.g. a group of seamounts); (3) ephemeral areas (e.g. a seasonal seabird feeding area); and (4) dynamic features (e.g. the North Pacific Transition Zone). These designations may be especially helpful for more precisely describing types of features and appropriate management approaches in ABNJ.

Other similar sets of criteria generated by IUCN and NGOs include: the original IUCN MPA criteria, Important Bird and Biodiversity Areas (IBAs),[9] Important Marine Mammal Areas (IMMAs)[10], and Key Biodiversity Areas (KBAs).[11] Criteria for Important SeaTurtle Areas are also currently under development. These criteria and associated processes are generally developed to help prioritise sites for conservation by governments and intergovernmental organisations through the implementation of a variety of measures including MPAs and other ABMTs.

One commonality across the criteria suites for EBSAs, IBAs, IMMAs and KBAs is that they are not management measures, but rather are intended to stimulate the competent management authorities to adopt appropriate measures to enhance their protection .These criteria and the results of the various analyses thus provide a very useful information layer, and an important place to begin, for prioritizing proposals for ABMTs. Nevertheless, it is important to also recall the common challenge in applying these criteria in ABNJ: lack of data on species and ecosystem as well as the difficulty in identifying boundaries due to marine environments being dynamic and fragmented. A challenge specific to IBAs and KBAs may be their high threshold for identifying areas in need of protection in a data poor offshore ocean. Moreover, the use of high thresholds in areas where data is scarce and/or species hard to track remotely may not be consistent with the precautionary principle or the goal of ecosystem resiliency (beyond species recovery). Additionally, as IBAs and KBAs focus on such a small area that meets the empirical threshold, it could result in a much smaller area being designated than is needed to protect these ecosystems or species.

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[9] BirdLife's Important Bird and Biodiversity Areas (IBAs) are: "Places of international significance for the conservation of birds and other biodiversity." The result of applying robust, standardised criteria to identify sites based on e.g. species aggregation, IBAs are identified based on a scale of global, regional and sub-regional criteria. The Global IBA Criteria, which focus on globally threatened species, restricted range species, and congregations of the global population on a regular and predictable basis are complemented by Regional IBA Criteria and Sub-regional IBA Criteria. For more information on IBAs, see https://www.birdlife.org/worldwide/programme-additional-info/important-bird-and-biodiversity-areas-ibas

[10] Important Marine Mammal Areas (IMMAs) are defined as discrete portions of habitat important to marine mammal species that have the potential to be delineated and managed for conservation. IMMA criteria and sub-criteria strive to encompass critical aspects of marine mammal biology, ecology and population structure, including vulnerability, distribution, abundance, special attributes and key life cycle activities. IMMAs are identified through an expert-led process involving the collation and assessment of evidence against a set of selection criteria. For more information on IMMAs, see https://www.marinemammalhabitat.org/immas/

[11] Key Biodiversity Areas focus on areas of global importance for the persistence of biodiversity based on quantitative criteria for geographic restriction, ecological integrity, biological processes or irreplaceability through quantitative processes. KBA criteria are most suitable for inshore marine ecosystems where ecosystems/species can be mapped and counted and for offshore systems where species aggregations can be tracked and seen from above - like seabirds or marine mammals. IUCN (2016). A Global Standard for the Identification of Key Biodiversity Areas, Version 1.0. First edition. Gland, Switzerland: IUCN https://portals.iucn.org/library/node/46259

Regarding criteria used for identifying MPAs at the regional level, several regional seas organizations have adopted site specific criteria for MPAs as well as representative networks. For example, the OSPAR Commission for the North East Atlantic has adopted Guidelines for the identification and selection of Marine Protected Areas in the OSPAR Maritime Area (Agreement 2003-17)[12] The guidelines include ecological criteria/considerations such as:

1. Threatened or declining species and habitats/biotopes
2. Important species and habitats/biotopes
3. Ecological significance
4. High natural biological diversity
5. Representativity
6. Sensitivity
7. Naturalness

In addition, the OSPAR Guidelines include practical considerations such as size; potential for restoration; degree of acceptance; potential for success of management measures; potential damage to the area by human activities and scientific value.

With respect to the establishment of protected areas, the Cartagena Convention for the Wider Caribbean Region Specially Protected Areas and Wildlife Protocol (SPAW Protocol)[13] built on the experience of the Mediterrean Protocol for Specially Protected Areas of Mediteranean Importance by taking a broad approach that includes both representative and important areas. Article 4 of the SPAW Protocol calls for the establishment of protected areas in order to conserve, maintain and restore, in particular:

> a) representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain biological and genetic diversity;
>
> b) habitats and their associated ecosystems critical to the survival and recovery of endangered, threatened or endemic species of flora or fauna;
>
> c) the productivity of ecosystems and natural resources that provide economic or social benefits and upon which the welfare of local inhabitants is dependent; and
>
> d) areas of special biological, ecological, educational, scientific, historic, cultural, recreational, archaeological, aesthetic, or economic value, including in particular, areas whose ecological and biological processes are essential to the functioning of the Wider Caribbean ecosystems[14].

[12] To advance its 2003 OSPAR Recommendation 2003/3 on a Network of Marine Protected Areas as amended by Recommendation 2010/2, the parties adopted overarching Guidance for the development and management of the OSPAR network: https://www.ospar.org/work-areas/bdc/marine-protected-areas/guidance-for-the-development-and-management-of-the-ospar-network

[13] PROTOCOL CONCERNING SPECIALLY PROTECTED AREAS AND WILDLIFE TO THE CONVENTION FOR THE PROTECTION AND DEVELOPMENT OF THE MARINE ENVIRONMENT OF THE WIDER CARIBBEAN REGION https://www.car-spaw-rac.org/IMG/pdf/spaw-protocol-en.pdf

[14] Article 4. https://www.car-spaw-rac.org/IMG/pdf/spaw-protocol-en.pdf

CCAMLR adopted a slightly different approach by focusing on overarching objectives rather than criteria as the basis for a representative system of MPAs. The CCAMLR MPA framework[15] includes as objectives:

- (i) the protection of representative examples of marine ecosystems, biodiversity and habitats at an appropriate scale to maintain their viability and integrity in the long term;
- (ii) the protection of key ecosystem processes, habitats and species, including populations and life-history stages;
- (iii) the establishment of scientific reference areas for monitoring natural variability and long-term change or for monitoring the effects of harvesting and other human activities on Antarctic marine living resources and on the ecosystems of which they form part;
- (iv) the protection of areas vulnerable to impact by human activities, including unique, rare or highly biodiverse habitats and features;
- (v) the protection of features critical to the function of local ecosystems;
- (vi) the protection of areas to maintain resilience or the ability to adapt to the effects of climate change.

These objectives will be worth recalling when considering the components of a representative network of MPAs beyond the CCAMLR region.

B. Approaches used by sectoral organizations to adopt area-based conservation measures

There are many different approaches to establishing ABMTs. However, at present what is lacking is a systematic process for identifying vulnerable, important or representative areas in collaboration with other ocean users or for designing ABMTs based on common criteria, shared data, information and context based on cross-sectoral cooperation and coordination. Without such elements it remains difficult to address connectivity, cumulative effects or need for coherent management outcomes.

With respect to fisheries (but only with respect to deep sea bottom contact fishing), RFMOs responsible for regulating deep sea bottom fishing have adopted protective measures for Vulnerable Marine Ecosystems (VMEs), based on criteria developed by the FAO, pursuant to the UNGA resolution. This 2006 UNGA resolution specifically called on RFMOs to conduct prior assessments of areas used for deep sea fisheries to discern whether the area contained or was likely to contain vulnerable marine ecosystems and to adopt management measures to prevent significant adverse impacts, again as defined in FAO Guidelines.

CCAMLR adopted a broader approach that both prohibited deep sea bottom trawling throughout the CCAMLR area and adopted a framework for developing a representative system of MPAs based on the best available science.[16] For this purpose it divided the Southern Ocean into nine

[15] CCAMLR Conservation Measure 91-04 (2011) https://www.ccamlr.org/en/measure-91-04-2011
[16] CCAMLR Conservation Measure 91-04 (2011) https://www.ccamlr.org/en/measure-91-04-2011

MPA planning domains, as a means to organise future activities related to this effort. The planning domains were to reflect the scale and location of current and planned research efforts and to provide a scale for reporting and auditing units.[17]

The International Maritime Organization (IMO) has a process for designating Particularly Sensitive Sea Areas (PSSA)[18] for individual areas that are important for a range of reasons, including ecological, social, cultural or economic values, or importance for science or education and that are vulnerable to the impacts of shipping. Each application must include a request for specific associated protected measures to prevent, reduce or eliminate the identified vulnerability from e.g. pollution or other damage caused by ships, and each PSSA must be accompanied by an IMO-specific protective measure to be identified as a PSSA. Of possible relevance to future ABMT planning and review processes, to qualify as a PSSA, as for an EBSA, an area only has to meet one of the many criteria throughout the entire area, or ensure that at least one of the criteria exist throughout the entire proposed area.

The International Seabed Authority (ISA)'s initial approach to designing a network of no-mining areas (Areas of Particular Environmental Interest or APEIs) as part of a regional environmental management plan (REMP) for the Clarion Clipperton Zone (an area of interest for polymetallic nodules in the Pacific Ocean) focused on regional depth, biogeographic and ecological gradients with the goal of protecting a full range of habitat types.

In 2019, the ISA added additional ABMT approaches including "Sites in Need of Protection", "Areas in Need of Protection", and "Sites / Areas in Need of Precaution". This allowed specific sites and areas of importance to be described in addition to broad gradient APEIs. The Northern Mid-Atlantic Ridge (nMAR) Regional Environmental Management Plan (REMP) process conducted two expert workshops in 2019 and 2020. These workshops focused specifically on a planning area defined by a 100km buffer zone centered on the active spreading ridge. The expert workshops identified 11 active hydrothermal vent sites as "Sites in Need of Protection" and 3 large fracture zones as "Areas in Need of Protection". The workshops also described 10 inferred active hydrothermal vent sites as "Sites in Need of Precaution" as well as areas of potential cold water coral habitat as "Areas in Need of Precaution". As noted in the Evora workshop report: "The workshop discussed but did not attempt to apply broader scale network or regional criteria (i.e. representativity, connectivity, replication or adequacy) in our current work. It is the consensus of this workshop that these network criteria for the region as a whole, as outlined in the ISA REMP guidance document (2019), be applied in the future for this region and be incorporated into future REMP updates.[19] A second expert workshop was convened in

[17]CCAMLR MPA Planning Domains https://www.ccamlr.org/en/science/mpa-planning-domains

[18] REVISED GUIDELINES FOR THE IDENTIFICATION AND DESIGNATION OF PARTICULARLY SENSITIVE SEA AREAS, Resolution A.982(24) Adopted on 1 December 2005
https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/A24-Res.982.pdf

[19] REPORT OF THE WORKSHOP ON THE REGIONAL ENVIRONMENTAL MANAGEMENT PLAN FOR THE AREA OF THE NORTHERN MID-ATLANTIC RIDGE
25-29 November 2019, Évora, Portugal https://isa.org.jm/files/files/documents/Evora%20Workshop_3.pdf

2020 to review the REMP plan and provide recommendations to the ISA Legal and Technical Commission (LTC).[20]

C. Complementary "systems" approaches required to develop networks of MPAs and other ABMTs in ABNJ

The establishment of an effective network of protected areas may follow a systematic and iterative approach where known important areas are described first and then gaps in coverage are evaluated based on network criteria as well as management priorities. The assembly rules for developing networks of MPAs will thus be important to consider at the earliest stage possible. Best practice for designing a network of MPAs requires consideration of important areas and concepts of representativity, connectivity, coherence and duplication.[21] To date most ABMTs have primarily focused on important areas, not representativity. Thus the BBNJ Agreement provides the opportunity to take a more systematic approach that considers both important areas and representative areas at multiple scales, from transboundary to regional to global.

In addition to defining the criteria for EBSAs, the CBD has also adopted criteria and guidance for designing representative networks of MPAs in open ocean and deep sea habitats.[22] In addition to EBSAs, there are four other criteria:

- Representativity
- Connectivity
- Replicated ecological features
- Adequate and viable sites

The guidance outlines four initial steps to be considered in the development of representative networks of MPAs, and in conjunction with the above criteria provide a method to move forward in a logical way.[23] These four steps also reflect current best practice for ABNJ.

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[20] REPORT OF THE WORKSHOP ON THE DEVELOPMENT OF A REGIONAL ENVIRONMENTAL MANAGEMENT PLAN FOR THE AREA OF THE NORTHERN MID-ATLANTIC RIDGE WITH A FOCUS ON POLYMETALLIC SULPHIDE DEPOSITS 23 November - 4 December 2020; Online https://isa.org.jm/files/files/documents/Final_Draft_workshop_report-nMAR_REMP.pdf

[21] See e,g., IUCN World Commission on Protected Areas (IUCN-WCPA) (2008). Establishing Marine Protected Area Networks—Making It Happen. Washington, D.C.: IUCN-WCPA, National Oceanic and Atmospheric Administration and The Nature Conservancy. 118 p. https://www.iucn.org/sites/dev/files/import/downloads/mpanetworksmakingithappen_en.pdf

[22] CBD IX/20 Annex II SCIENTIFIC GUIDANCE FOR SELECTING AREAS TO ESTABLISH A REPRESENTATIVE NETWORK OF MARINE PROTECTED AREAS, INCLUDING IN OPEN OCEAN WATERS AND DEEP-SEA HABITATS https://www.cbd.int/decision/cop/?id=11663

[23] CBD IX/20 Annex III: FOUR INITIAL STEPS TO BE CONSIDERED IN THE DEVELOPMENT OF REPRESENTATIVE NETWORKS OF MARINE PROTECTED AREAS https://www.cbd.int/decision/cop/?id=11663

1. Scientific identification of an initial set of ecologically or biologically significant areas. The criteria in annex I to decision IX/20 should be used, considering the best scientific information available, and applying the precautionary approach.[24] This identification should focus on developing an initial set of sites already recognized for their ecological values, with the understanding that other sites could be added as more information becomes available.
2. Develop/choose a biogeographic, habitat, and/or community classification system. This system should reflect the scale of the application and address the key ecological features within the area. This step will entail a separation of at least two realms–pelagic and benthic. [*Authors' comment: it is now possible to consider also the midwater column between the epipelagic and benthic realms*]
3. Drawing upon steps 1 and 2 above, iteratively use qualitative and/or quantitative techniques to identify sites to include in a network. Their selection for consideration of enhanced management should reflect their recognised ecological importance or vulnerability, and address the requirements of ecological coherence through representativity, connectivity, and replication.
4. Assess the adequacy and viability of the selected sites. Consideration should be given to their size, shape, boundaries, buffering, and appropriateness of the site-management regime.

Building on the above four-step process outlined in CBD Annex III,[25] an initial approach to site-identification could be based on known sites of importance and/or those that already have some existing management measures such as VMEs or APEIs. Building on important areas is intuitive, scientifically justified, and well established in international policy. Existing management measures generally focus on areas where there is some knowledge of biodiversity and human stressors, but often only address single threats. By building on these measures and, as appropriate, making their protection cross-sectoral, a BBNJ ABMT strategy will bolster the work of sectoral and regional management authorities and prevent them from being undermined by other bodies.

While there has been some discussion around whether to start with Step 2 (biogeographic classifications) or to start with Step 1 (site identification), neither is necessarily wrong, as the decision could be influenced by data availability. For example, data poor regions would likely move straight to the biogeographic classification approach. One challenge of starting with a representative approach is that it can be challenging to explain the benefit of individual sites. Nevertheless, large MPAs, such as the Phoenix Islands Protected Area, that are established as a proactive measure can become important targets for research that thereby helps to quickly establish their benefits.

[24] The precautionary approach is essential to ensure that areas with limited BBNJ knowledge don't fall through the cracks.

[25] CBD IX/20 Annex III FOUR INITIAL STEPS TO BE CONSIDERED IN THE DEVELOPMENT OF REPRESENTATIVE NETWORKS OF MARINE PROTECTED AREAS https://www.cbd.int/decision/cop/?id=11663

While data-rich (both empirical and modeled data) regions may be able to support a wide range of sectoral and cross-sectoral, static or dynamic ABMTs, the knowledge constraints in data-poor regions may restrict the types of ABMTs that can be considered and may require a more precautionary approach to spatial management. Additional guidance may be needed to inform the design and implementation of ABMTs in parts of the ocean where the type of knowledge or its spatial/taxonomic coverage differs. Different types of knowledge carry different levels of certainty and precision and can therefore play different roles in an ABMT strategy. A decision-tree-type framework that is supported by a comprehensive repository of the empirical vs. modeled data available across different parts of the high seas may help guide decision-makers across a wide range of knowledge availability scenarios.

There is a circular paradox between the design of an ABMT and the biological or ecological data available to delineate and characterize the range of the feature or species of conservation interest, since they depend on one another. A potential higher-order split of a decision-tree framework could provide information on whether the geographic area of interest is data-rich or data-poor in the context of the specific species, habitat, ecosystem or process of interest for the design of an ABMT. Additional levels in the decision-making framework could shed light on the availability of empirical vs. modeled data and the relative quality of such data, the availability of information on the nektonic or planktonic (i.e. oceanographic) connectivity within the region of interest or information on the anthropogenic stressors to components of BBNJ. While the identification and design of potential ABMTs will require an extensive assessment of the unique characteristics and threats to a site, a decision-tree framework may help proponent States navigate the intricate process of evaluating different levels of data availability, level of risk due to anthropogenic activities or expected disturbance due to climate change.

There may be questions as to whether it is better to take a primarily global approach or proceed on a region by region basis. In fact, both are needed. A global approach is better equipped to encompass connectivity generated by migratory species and to ensure that regionally abundant but globally threatened species are given appropriate consideration. A regional (or bio-regional) approach can provide better resolution data, and more appropriate scale for ease of coordination and implementation. Regions should be identified based on a consistent set of biophysical characteristics (i.e., biogeographic classification schemes), and generated simultaneously to ensure that no parts of the ocean are left out. Adopting an ecoregional approach to the establishment of ABMTs for all the different components of BBNJ may help ensure that all relevant stakeholders (e.g. sectoral actors or coastal and island nations) can be identified and engaged in the process of establishing compatible management and methods. Further, use of biogeographic classifications will avoid the need to align regional boundaries with multiple, inconsistent management boundaries (e.g., OSPAR, NEAFC, ICCAT, and ISA region or mandate boundaries).

Ensuring the complementarity of management strategies within and beyond areas of national jurisdiction will be one of the key factors in the coherence and success of the BBNJ Agreement, as many species or features of concern may straddle national and international boundaries. Global biogeographic classifications already include EEZs. Use of such ecologically relevant regionalisations will ensure the appropriate management authorities are cooperating to address

complete ecological units, rather than management stopping at arbitrary political boundaries in ABNJ (i.e., FAO statistical areas). The UN Fish Stocks Agreement (UNFSA) for highly migratory and straddling fish stocks has already recognized the importance of accounting for the biological unity of fish stocks across jurisdictions (e.g. UNFSA Article 7.2 (a-d)). Specifically, UNFSA Article 7.2 calls for:

> "Conservation and management measures established for the high seas and those adopted for areas under national jurisdiction shall be compatible in order to ensure conservation and management of the straddling fish stocks and highly migratory fish stocks ***in their entirety***." (emphasis added).

Given the transboundary nature of a significant component of known biodiversity in the high seas, it is important to ensure that the design and implementation of conservation and management measures (e.g. ABMTs) or the assessment of potential impacts for any given species, habitat or ecosystem under the BBNJ Agreement address their complete geographic range in an ecologically coherent manner.

Part III. Building the science

Area-based management can be directed towards a number of different objectives including the maintenance or restoration of species and habitats, ecosystem function and ecosystem services. In all three cases, knowledge of the distribution and status of the species, habitats, ecosystems and regional threats are critical in order to develop and prioritize ABMT implementation. Because knowledge of species, habitats and ecosystems in ABNJ are generally limited and often spatially skewed to more well studied regions, one of the initial steps towards the development of an ABMT strategy is the development of an objective gap analysis assessing what data are available. This initial gap analysis will need to consider gaps in habitat mapping, taxonomic coverage, representativity, and connectivity in both space and time. This framework will also need to consider future scenarios of expected changes in species distributions and ecosystem effects due to climatic change.

A. The need for an initial ABMT information gap analysis

One of the initial steps in a gap analysis is to decide on potential units of aggregation, such as marine ecoregions, in order to develop a comparable regional assessment. This type of ecoregional approach will need to rely on a biogeographical approach and would be best implemented using a system that considers surface, water column and benthic features at a minimum. The biogeographic classification for global open ocean and deep sea areas (GOODS) published in 2009 provides an initial starting point, but more recent ocean classification schemes, such as the Ecological Marine Units (EMU), now consider three dimensional water column units. Refinements of three dimensional biogeographic classifications systems would be

suggested for future ABMT evaluation and implementation in order to better distinguish specific habitat and ecosystem domains in the water column as well as ocean surface and sea floor.

In addition to recommending biogeographic units that include distinct vertical features, it is also strongly recommended that future assessments of ABMTs also consider the dynamic nature of many ocean ecosystems**.** So where possible, incorporation of dynamic oceanographic characteristics, providing a fourth dimension to the analysis framework will be necessary. Examples of dynamic ocean seascapes have emerged and provide potential frameworks for defining more precise frameworks for evaluating and prioritizing ABMTs in both space and time.

Once appropriate biogeographic units are selected, information on taxonomic distributions, habitat and ecosystem information can be assessed by each ecoregion to allow for comparable assessment between different ecoregions. An iterative gap analysis approach will help identify the availability of information to answer questions of species and habitat representativity by region and provides context for the assessment of proposed ABMT areas. This gap analysis framework can also be used to provide a benchmark assessment to address and quantify future change.

A next step in a gap analysis approach is to use this information to prioritize efforts to fill important data and knowledge gaps. This gap filling process may take several forms. Efforts may focus on the development of predictive models or surrogate data when direct observation data do not exist (e.g. use of a predictive model of cold water corals as a surrogate for direct observations of these habitat forming species.)

Identifying gaps in our knowledge of the existing distribution of species, habitats and ecosystems directly informs the representativity ABMT network criteria. The second ABMT network criteria, connectivity, will require focused gap analysis efforts on both passive, oceanographic (larval) connectivity as well as active, migratory connectivity. Oceanographic connectivity transports essential planktonic larvae and juveniles between habitats throughout many species' life histories. These connections are essential for the maintenance of many marine ecosystems and populations. These connections often span across both EEZ and ABNJ boundaries (Popova 2019) and will require assessments beyond ABNJ. Similarly, highly migratory marine species (e.g. seabirds, sea turtles, marine mammals, sharks, billfish) also rely on connectivity between spatially disparate regions during seasonal migrations and travels between spawning and breeding locations. Assessing our current knowledge of the important connectivity corridors, as well as spawning, feeding and breeding areas in and beyond ABNJ will be essential for ABMT planning. The Migratory Connectivity of the Oceans (MiCO) program provides a platform for the assessment of our current knowledge of connectivity for these species.

The third and fourth ABMT network criteria, replication and adequacy, will be informed by an assessment of the numbers of representative sites and connecting corridors protected and the status and viability of these areas. While these criteria necessarily require an iterative approach as new areas are protected, an inventory of proposed areas can allow for prospective assessments of proposed portfolios of ABMTs in ABNJ.

An additional important outcome of a gap analysis approach is to prioritize and coordinate new data collection and data synthesis efforts. For example, the DOSI has used this type of approach to identify priorities for the next decade. The emerging Decade of Ocean Science is also working to set broad ocean data collection and analysis priorities.

B. Setting ABMT science agenda and priorities

There is potential for a well developed and resourced BBNJ Science Advisory Body to effectively set the necessary ocean science agenda and research priorities for the implementation of ABMTs into the future. If provided a focused mandate and appropriate resources, a Science Advisory Body could help coordinate and facilitate future high seas biodiversity research in order to ensure equitable access to information/opportunities and to begin addressing the geographic and taxonomic biases of high seas biodiversity knowledge. This body could also act in a convening role to coordinate with other existing institutions and processes that contribute to ABMT science needs. In the absence of a role for or capacity of the BBNJ Science Advisory Body, the COP could designate an existing body or establish a new body to undertake this role, in cooperation and coordination with the Science Advisory Body, the Secretariat and the Conference of Parties.

C. Gaining access to existing information

While some ecosystems in ABNJ remain poorly sampled, many States and ocean industries have collected but not yet shared vast amounts of key information relevant to BBNJ that would be of great benefit if made publicly available. It will be of utmost importance to encourage the disclosure of as much existing knowledge on the distribution and composition of BBNJ as possible in the early stages of the treaty implementation in order to prioritize areas of high risk and priority, as well as to strategically guide the collection of new information as part of UN Decade of Ocean Science initiatives.

Part IV. Addressing data management needs

A. Identifying existing databases, data sources and data collections

A key element for addressing the data management needs for operationalizing an ABMT strategy under the BBNJ Agreement will be determining how much of the knowledge that has already been collected and curated by relevant global or regional sectoral bodies can be made more readily available for Parties to the new BBNJ Agreement via a clearinghouse mechanism or other open information sharing mechanism. This would also apply to relevant ocean observing systems and networks such as the Biology and Ecosystems Panel of the Global Ocean Observing System (GOOS BioEco), the Ocean Biodiversity Information System (OBIS) or the Marine Biodiversity Observation Network (MBON) of the Group on Earth Observations

Biodiversity Observation Network (GEOBON), which already share a vision for building and sustaining a global ocean system of marine biological and ecosystem observations.[26]

OBIS, which is the most comprehensive repository of biological information publicly available for ABNJ, and one of many repositories of spatially-explicit information on the biological and oceanographic characteristics of ABNJ, will likely be a key source of information within the new clearinghouse mechanism. Information on the spatial and temporal distribution of biodiversity data in OBIS will play an important role in identifying biodiversity knowledge gaps across ocean basins. Similarly, information on the institutions contributing BBNJ data to OBIS, which include mostly government agencies, academia and civil society, may help identify the key knowledge holders of biological and ecological information of ABNJ across geographic regions. It would therefore be strategic for the BBNJ agreement to support the integration of existing biological and environmental information repositories in a future clearinghouse mechanism for the BBNJ Agreement, or to encourage this to happen in connection with it.

B. Key questions and issues for a future data management system

Yet there are many questions that still need to be addressed in considering the parameters for any data management system. An important overarching question is how to get existing monitoring data streams into this process? Can existing sectoral sources of biodiversity information (e.g. RFMOs or ISA) be merged with existing repositories of biodiversity information such as OBIS? Does the quality and (spatiotemporal and taxonomic) resolution of the different data streams allow for it? How will it be possible to communicate detailed data use caveats alongside the data themselves? Improvements in data interoperability and web services could help with data flow between information systems, but will require investment at existing information centers to establish. How will this investment be provided? An overview of existing portals and interoperability between data centers might be a helpful step in assessing how a BBNJ treaty should approach this.

Additional questions that need to be addressed include:

- As existing sectoral bodies are important vehicles for gathering biodiversity information on certain types of ecosystems (e.g. hydrothermal vents) or species (e.g. tunas or small pelagics), how can the BBNJ treaty encourage them to improve the quality and interoperability of the data that is being collected to help data flow more seamlessly.
- In order to better understand what data management needs will be, it will be important to identify the holes that need to be filled? Significant portions of the ocean are still missing a competent management authority responsible for monitoring and managing human activities. In the context of stressors on BBNJ, the lack of non-tuna RFMOs in regions such as the Southwest Atlantic or the Eastern Indian Ocean pose significant challenges for ensuring the conservation and sustainable management of target and non-target biodiversity.

[26] Letter of Agreement between GOOS BioEco, OBIS and GEOBON MBON https://obis.org/documents/GOOS-BioEco-OBIS-GEOBON-MBON_collaboration_SIGNED.pdf

- What are the possible roles for the clearinghouse mechanism for ABMTs? Will it serve as just a data repository for where ABMTs are in place, can it also include more scientific data on the associated species and ecosystems, will it serve also as a decision tool or for monitoring of progress? Would it have any functionality for Parties to import data and test scenarios?
- What existing institutions could/should contribute to ABMT clearinghouse needs?[27]
- Can a distributed model work to provide this clearinghouse function?
- How can a distributed clearinghouse model be sustained through time?
- What are the types of data and data products required to support ABMT identification, implementation and monitoring? Need to ensure that the spatial, temporal and taxonomic resolution requirements are appropriate if dynamic ABMTs are to be considered.

Part V. Advancing capacity

A. Enhancing the scientific and technical capacity of States

Advancing the scientific and technical capacity of States in the context of identifying and proposing ABMTs under the new Agreement will require democratizing access to key biological and ecological information in ABNJ, including knowledge on the distribution and impacts of sectoral activities on all forms of biodiversity as well as information on the ecological or oceanographic connectivity of their region of interest with other areas of ABNJ. In addition to facilitating access to existing biodiversity information, bolstering the capacity of States for collecting meaningful biodiversity information will not only be fundamental for the advancement of ABMT and EIA strategies, but is also highly aligned with the principles of cooperation under UNCLOS (Part XIII & Part XIV).

Enhanced data sharing and capacity development may further enable States to incorporate temporal and spatial dynamics in the design and operationalization of ABMTs under a BBNJ Agreement in particular those changes in the vertical and horizontal distribution of biodiversity on a seasonal basis, and increasingly, due to climate change (Ortuño Crespo et al., 2020; Payne et al., 2019; Pentz et al., 2018; Pinsky et al., 2018). Enhancing this type of knowledge will be pivotal for implementing a treaty which is capable of responding to the changes in the

[27] See eg Martin, J.C.G., Macmillan-Lawler, M., Fletcher, R., McDermott Long, O., Kingston, N., Thomas, H. (2018). A review of data storage and sharing options for the South-East Pacific to support area-based planning in Areas Beyond National Jurisdiction. Cambridge (UK): UN Environment World Conservation Monitoring Centre. 16 pp.https://www.unep-wcmc.org/featured-projects/abnj-deep-seas-project

composition and distribution of not only biodiversity, but also habitats, ecosystems, oceanographic processes and anthropogenic stressors.

B. Potential role of regional/bioregional integrated environmental assessments

One avenue for addressing many of the aims of the BBNJ Agreement could be through support for integrated environmental assessment processes at a regional/bioregional scale through partnerships between States, sectoral organizations and other stakeholders with different levels of ocean research and monitoring capabilities. Regional assessments can include descriptions of the existing biological, chemical, physical, and historical characteristics; identification of sensitive habitats and areas; identification of areas of human activities; analyses of ecosystem conditions; and assessments, forecasts, and modelling of cumulative impacts (Caldow et al., 2015; IOPTF, 2010).[28]

Few States currently have access to the knowledge and expertise needed to oversee integrated environmental assessments, while project proponents may not be required to share data, assess potential effects outside their proposed project site, or consider alternatives. A fully integrated multi-disciplinary perspective will therefore require increased capacity for scientific research and associated technology. This can be achieved through international cooperation, as well as by open-access publishing and sharing data and information. Initiatives, such as the UN Decade on Ocean Science for Sustainable Development (2021-2030) can play an important role

Regional environmental assessments could serve as platforms for advancing implementation of many of the principles and objectives of the BBNJ Agreement. Appropriate capacity building and training programme(s) could advance ecosystem-based management by supporting scientific monitoring of the ecosystem and its resources (including data collection, compliance monitoring and reporting to support science-based decision making and implementation) as well as building capacity for adaptive, solutions-based ecosystem and fisheries management and institutional support.

Environmental assessments could also provide a mechanism to support equitable and sustainable use and access to tools and technologies related to marine genetic resources that can advance understanding, managing and sustaining ocean health. Training and equipment to use these tools could be made an explicit part of the benefit sharing and capacity building and

[28] For further information on the possible role and process for regional environmental assessments under the BBNJ Agreement, see Gjerde, K.M., Wright, G., and Durussel, C., 2021 Strengthening high seas governance through enhanced environmental assessment processes: A case study of mesopelagic fisheries and options for a future BBNJ treaty, STRONG High Seas Project, 2021

technology transfer elements on the BBNJ Agreement, thereby helping to fulfil existing UNCLOS obligations.[29]

The benefits could be many as it is thought that the process of conducting an REA can galvanize cross-sectoral cooperation, by ensuring all stakeholders have improved access to data and with it a far more sophisticated understanding of what is known and any knowledge gaps that might need to be filled in order to make informed decisions. By improving knowledge of status, trends and drivers of change, such initiatives could thereby enable planning ahead, avoiding conflicts, support ABMTs and cross-sectoral marine spatial planning processes, as well as streamline EIA processes. They can further contribute to good governance by facilitating

Part VI. Next Steps

The BBNJ Agreement provides a unique opportunity to address ABMTs from a global and cross-sectoral perspective through a systematic process that can safeguard global ocean biodiversity and ecosystem functions across a range of scales both spatial and temporal.

To advance progress towards a comprehensive system of MPAs and other ABMTs, this strategy has identified that a systems approach is needed together with significant efforts to advance the science, data management and capacity. It has identified the players, criteria and approaches currently used to identify important and representative areas, the approaches used by sectoral organizations to adopt area-based conservation measures, and complementary "systems" approaches to develop networks of MPAs and other ABMTs in ABNJ in the context of a changing ocean.

Best practice for designing a network of MPAs requires consideration of important areas and concepts of representativity, connectivity, coherence and duplication. A pragmatic approach to initial site-identification could be based on known sites of importance and/or those that already have some existing management measures such as VMEs or APEIs. By first building on areas where there is knowledge and recognized threats, a BBNJ ABMT strategy can quickly demonstrate how comprehensive protection can bolster the work of sectoral and regional management authorities to safeguard marine biodiversity and ecosystem processes. However,

[29] Harden-Davies, H., Vierros, M., Gobin, J., Jaspars M., von der Porten, S., Pouponneau, A., Soapi, K. (2020). Science in Small Island Developing States: Capacity Challenges and Options relating to Marine Genetic Resources of Areas Beyond National Jurisdiction. Report for the Alliance of Small Island States. University of Wollongong, Australia. 30 October 2020 https://www.aosis.org/documents/

to ensure that areas with limited BBNJ knowledge don't fall through the cracks, it is important to also apply a precautionary approach to spatial management. A decision-tree may be useful.

In order to get the benefits of both global and cross-sectoral regional approaches, and apply some of the lessons learned from site-specific and representative approaches, it will be necessary to foster a more systematic ABMT implementation process that considers and adapts to the following components and elements:

- **Spatial and temporal considerations**
    - Acknowledges that ecosystems function at different spatial scales and change over time due to factors such as human activities and climate change.
    - Builds models to reflect these temporal changes where possible
    - Addresses global and regional connectivity through systematic mapping and modeling
    - Reflects horizontal and vertical connectivity and dynamics
    - Addresses key taxa including migratory species
    - Considers the impacts of climate change in site selection including the shifts in location of habitats and species that organisms along with it
    - Recognizes potential need to implement non-static ABMTs to protect some migratory species and habitats rather than just ABMTs fixed statically in space and time
- **Scientific and information management considerations**
    - Builds upon the use of the best available information for both planning and management purposes.
    - Has mechanisms to collect data at the necessary resolutions (spatial, temporal, taxonomic)
    - Identifies key gaps and uncertainties, and has mechanisms to either build knowledge or address uncertainties (or both)
    - Incorporates predictions of biodiversity distribution (i.e. role of modeling outputs) into the establishment of sites to part of the goal of building climate resilience into the high seas ABMT network.
    - Uses logical and consistent boundaries
- **Institutional, procedural and governance considerations**
    - Acknowledges the importance of integrating actions to conserve biodiversity within a broader management context
    - Enables mechanisms that can protect ecological space in the ocean both within and outside MPA networks as biodiversity distribution and quality changes in response to climatic disruption.
    - Ensures the complementarity of management strategies within and beyond areas of national jurisdiction to address the many species or features of concern that straddle national and international boundaries
    - Is inclusive of all participants who care to join
    - Identifies and involves relevant stakeholders
    - Builds knowledge and capacity of all players
    - Enables a non-politicized approach

- Ensures an appropriate mix of experts with both global and more local knowledge
- Builds on and reflect regional characteristics, stressors and issues
- Builds on different forms of knowledge
- Addresses the issue that workshops may lack similar levels of expertise from region to region and finds other ways to ensure coherence of results.

To synthesize current knowledge and advance the science, a helpful first step is an ABMT information gap analysis, based on agreed units of aggregation, such as marine ecoregions, that can enable comparable regional assessments. An initial gap analysis should consider gaps in habitat mapping, taxonomic coverage, representativity, and connectivity in both space and time to underpin consideration of future scenarios of expected changes in species distributions and ecosystem effects due to climatic change. Existing three dimensional biogeographic classifications systems will need to be further refined in order to better distinguish specific habitat and ecosystem domains in the water column as well as ocean surface and sea floor.

Future assessments should also consider the dynamic nature of many ocean ecosystems, seeking to provide a fourth, temporal, dimension to the analysis framework to create more precise frameworks for evaluating and prioritizing ABMTs in both space and time.

The envisaged gap analysis approach can help to i) prioritize efforts to fill important data and knowledge gaps through eg. the development of predictive models or surrogate data when direct observation data do not exist; ii) prioritize efforts on both passive, oceanographic (larval) connectivity as well as active, migratory connectivity across both EEZ and ABNJ boundaries; iii) identify the protective status of existing representative sites and connecting corridors and viability of these areas to allow for more informed assessments of proposed portfolios of ABMTs in ABNJ. These efforts can help to prioritize and coordinate new data collection and data synthesis efforts that can ideally feed into or stimulate targeted ocean data collection and analysis priorities under the emerging Decade of Ocean Science and other scientific initiatives.

Ideally the BBNJ Science Advisory Body will be empowered to set the necessary ocean science agenda and research priorities for the implementation of ABMTs into the future, although work can be started sooner through for example a project under the UN Decade of Ocean Science. If provided a focused mandate and appropriate resources, a Science Advisory Body could help coordinate and facilitate future high seas biodiversity research and also act in a convening role to coordinate with other existing institutions and processes that contribute to ABMT science needs. A major hurdle that the BBNJ Agreement can hopefully help overcome is to encourage the sharing of access to existing information that is held by sectoral organizations and industry participants.

To address data management needs, it will be necessary to identify existing databases, data sources and data collections, and clarify key questions and issues before moving ahead, though questions of funding for present data collecting and data collections are urgent.

With respect to capacity building, the potential role of regional/bioregional integrated environmental assessments could be considered as a mechanism for both enhancing the sharing and synthesizing of data as well as providing a focused arena for continuing partnerships and capacity development opportunities to advance multiple objectives of the BBNJ Agreement, including the implementation of MPA networks and other ABMTs, as well as to underpin further SEAs and EIAs.

Together these components of an ABMT strategy can accelerate progress in advancing the goals of the BBNJ Agreement and improve the health, productivity and resilience of the global ocean for the benefit of present and future generations.

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