



Towards an Ecosystem Approach to Management in Areas Beyond National Jurisdiction: REMPs for Deep Seabed Mining and the Proposed BBNJ Instrument

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The ocean plays a key role in sustaining life on our planet and is inextricably linked to biodiversity, climate, human well-being, and health. However, the governance of the ocean is primarily pursued through sectoral-based legal and institutional frameworks that falls short in ensuring the long-term protection of the marine environment and the sustainability of marine resources. This is especially concerning in areas beyond the limits of national jurisdiction (ABNJ) where human activities continue to expand. The existence of two distinct regimes in ABNJ, namely the High Seas (applicable to the water column, which is a global common) and the Area (applicable to the international seabed and its mineral resources, which are the common heritage of mankind), that have been largely regulated separately, impede the development and implementation of integrated marine environmental governance and biodiversity conservation in ABNJ. On the one hand, the International Seabed Authority (ISA), which is mandated to administer the mineral resources of the Area, is currently discussing a set of regulations to enable future exploitation activities. On the other hand, multilateral negotiations are taking place for the development of an internationally legally binding instrument for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (referred to as the proposed 'BBNJ' Instrument). Both processes offer a unique opportunity to foster an ecosystem approach to management (EAM) in ABNJ. In this article, we elaborate on options for stronger governance integration and the development of a coherent and collaborative interplay between these two processes. To this end, we explore the potential of Regional Environmental Management Plans (REMPs) established by the ISA as a case study to contribute to global biodiversity conservation, and the opportunity for the proposed BBNJ

Instrument to promote overarching coherence to biodiversity conservation in ABNJ, premised on EAM. We conclude that the proposed BBNJ Instrument could have a pivotal role to streamline multilateral action for the conservation of biodiversity in ABNJ by adopting an ambitious, overarching environmental vision and strategic goals, accompanied by strong implementation and enforcement mechanisms.

Keywords: ocean governance, Areas Beyond National Jurisdiction (ABNJ), BBNJ Instrument, International Seabed Authority (ISA), deep seabed mining, Regional Environmental Management Plan (REMP), ecosystem approach to management

1 INTRODUCTION

The ocean plays a key role in sustaining life on our planet and is inextricably linked to biodiversity, climate, human well-being, and health. It is the world's single largest ecosystem, with migration and sound communication of species that happens across thousands of kilometers, and complex food webs connected throughout the water column. Today, the ecological state of the ocean continues to deteriorate at an unprecedented rate (Independent Group of Scientists appointed by the Secretary-General, 2019; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 2019; IPCC, 2019; Nash et al., 2020) and the limits of the ocean's carrying capacity are being – or, in some cases, have been – reached (Irniss and Simcock, 2016). Emerging activities, such as deep seabed mining, present a new potential pressure of unknown scale, risk, and effects on marine ecosystems (Gollner et al., 2017; Jones et al., 2017; Van Dover et al., 2017; Niner et al., 2018; Drazen et al., 2020; Smith et al., 2020b), adding to the prevailing mix of threats to biodiversity (O'Leary et al., 2020), including climate change effects (Levin and Le Bris, 2015; Sweetman et al., 2017; Levin et al., 2020b). An ecologically intact and well-managed ocean in turn has a key role in progressing towards the climate and sustainable development goals (Hoegh-Guldberg et al., 2019).

The interconnected nature of the ocean and the need to consider the problems of the shared ocean space as a whole are reflected in the Preamble of the United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS lays the basis for the current ocean governance framework, establishing States rights, obligations, responsibilities, and competencies, and delimitating maritime boundaries, including two distinct legal regimes for marine areas beyond the limits of jurisdiction (ABNJ), the High

Seas and the Area.¹ On the one hand, the High Seas regime allows actors to freely engage in legitimate activities, such as shipping, navigation, marine scientific research, and fisheries as well as the laying of submarine cables, as long as certain obligations and requirements are met (see Part VII of UNCLOS). On the other hand, the Area regime in relation to the exploration or exploitation of the seafloor mineral resources falls within the remit of the International Seabed Authority (ISA), which is mandated to administer these resources as a common heritage and for the benefit of mankind as a whole (see Part XI of UNCLOS).

Because these activities are still expanding and regulated sectorally (Kim and van Asselt, 2016; Jouffray et al., 2020) environmental governance in ABNJ lacks a coherent and holistic governance based on precaution and knowledge-based decisions (Mahon et al., 2015; Gjerde et al., 2019). At present, competent management organisations in ABNJ, such as the International Seabed Authority (ISA), the International Maritime Organisation (IMO) or regional fisheries management organisations (RFMOs), have their own remit and responsibilities, acting mostly autonomously (Freestone et al., 2014), which hinders effective inter-organisational cooperation (Matz-Lück and Fuchs, 2014; Gjerde et al., 2019; Wright et al., 2019) and integrated management (Stephenson et al., 2019).

A transformative shift is needed from managing human activities in ABNJ through insulated sectoral governance approaches² in various legal contexts to an integrated and coherent global governance approach that accounts for planetary boundaries (Mace et al., 2014; Steffen et al., 2015; Nash et al., 2017; Lenton et al., 2019). This requires operationalising an ecosystem approach to the management (EAM) of human activities, which has been identified as a best-practice (UN General Assembly, 2019). EAM acts as a holistic governance framework based on principles as adopted by the parties of the Convention on Biological Diversity, CBD (Kirk, 2015; Gelcich et al., 2018), for tailor-made operationalization to the specific context (Convention on Biological Diversity, 2000). The overarching objective of ecosystem approaches, as observed by the UN General

Abbreviations: ABNJ, Areas Beyond the limits of National Jurisdiction; ABMT, Area-based Management Tool; BBNJ, Biodiversity Beyond National Jurisdiction; CBD, Convention on Biological Diversity; CCZ, Clarion-Clipperton Zone; EAM, Ecosystem approach to the management of human activities, used here to include ecosystem-based management; EIA, Environmental Impact Assessment; GES, Good Environmental Status; IGC, Intergovernmental Conference; ISA, International Seabed Authority; MPA, Marine Protected Area; MSP, Marine Spatial Planning; REM-P, Regional Environmental Management Plan; RFMO, Regional Fisheries Management Organisation; SEA, Strategic Environmental Assessment; SDG, Sustainable Development Goal; UNCLOS, United Nations Convention on the Law of the Sea; UNGA, United Nations General Assembly; VME, Vulnerable Marine Ecosystem.

¹See e.g. analysis of Freestone (2015). Explanation of terms in supplementary materials (1).

²A sectoral-based approach typically focuses on meeting its own interests and addressing the direct harm resulting from within the sector, while tending to neglect possibly interacting impacts or pressures from other activities (i.e. outside the sector), as well as climate change.

Assembly, ‘should be focused on managing human activities in order to maintain and, where needed, restore ecosystem health’.³

Although the legal regimes of the Area and the High Seas present different functions and objectives, both recognize the importance of protecting and conserving natural resources and ecosystems in ABNJ that are ecologically closely interconnected. To achieve a comprehensive and effective integrated management to tackle the systemic nature of the problems, consistency across legal regimes is needed (Markus and Singh, 2016). A common set of overarching goals and objectives to ensure the ecological integrity of ocean ecosystems (Kim and Bosselmann, 2015; Kim and van Asselt, 2016) may be implemented through mechanisms which require the synergistic interaction between the various actors (De Santo et al., 2019; Tang et al., 2021), eventually enhanced through a platform for exchange (Gjerde et al., 2019). Such mechanisms could be designed under the emerging internationally legally binding instrument (referred to as the proposed ‘BBNJ’ Instrument) under the auspices of the United Nations for the conservation and sustainable use of marine biodiversity from the surface to the seafloor in areas beyond national jurisdiction.

In parallel, the ISA has been in the process of developing Regional Environmental Management Plans (REMPs) – a mechanism defined by the ISA as ‘a proactive area-based management tool to support informed decision-making that balances resource development with conservation’ (International Seabed Authority, 2018b) – for regions with current or emerging mining interests. The concurrency of negotiations presents a window of opportunity for enhancing integrated environmental governance.

In this article, we elaborate on options for stronger governance integration and the development of a coherent and collaborative interplay between these two processes. To this end, we explore the potential of Regional Environmental Management Plans (REMPs) established by the ISA as a case study to contribute to global biodiversity conservation, and the opportunity for the proposed BBNJ Instrument to promote overarching coherence to biodiversity conservation in ABNJ premised on EAM. We conclude that the proposed BBNJ Instrument could play a pivotal role to streamline multilateral action for the conservation of biodiversity in ABNJ by adopting an ambitious, overarching environmental vision and strategic goals, accompanied by strong implementation and enforcement mechanisms, which, in turn, could inform and guide the REMP development process at the ISA (as well as other measures and efforts pursued by other sectoral organisations that operate in ABNJ). In this respect, this paper does not aim to suggest a set of specific mechanisms through which ABNJ can be better governed, but rather looks at REMPs as a case study to learn how the governance in ABNJ could be more coherently linked to ensure comprehensive ocean protection and sustainable use.

³UNGA Resolution 61/222 on Oceans and the Law of the Sea (20 December 2006), para. 119(b); Resolution 62/215 (22 December 2007), para. 99(b); Resolution 63/111 (5 December 2008), para. 117(b).

2 AN ECOSYSTEM APPROACH TO MANAGEMENT FOR ABNJ

The purpose of an EAM is to balance conservation, sustainable use, and fair and equitable sharing of benefits, including with future generations, provided by the use of natural goods and services (Secretariat of the Convention on Biological Diversity, 2004) with a focus on managing human activities to maintain and, where needed, restore ecosystem health. To achieve this change in perspective is required from individual sectoral impacts to an integrated and systemic management perspective to enable the transition to global sustainability (Costanza et al., 1998; Rockström et al., 2009; Liu et al., 2015; EEA, 2019; Independent Group of Scientists appointed by the Secretary-General, 2019).

The CBD Secretariat states that ‘There is no single way to implement the ecosystem approach (...). Indeed, there are many ways in which ecosystem approaches may be used as the framework for delivering objectives of the Convention in practice’ (Convention on Biological Diversity, 2000). In practice, EAM implementation has proven to be challenging, e.g. in national context due to insufficient financial resources, insufficient scientific information, institutional fragmentation and conflicts, lack of incentives and inadequate mandates (Macpherson et al., 2021). At the international level, the variation in terminology and differences between narratives, as well as the existence of diverging values and objectives among jurisdictions and agencies, are obstacles related to the approach (De Lucia, 2015; Rudd et al., 2018).

The philosophy of EAM, as well as its instruments for operationalization, provide the basis for more ambitious, coordinated, holistic and transboundary governance of interrelated areas of the ocean that are politically divided, such as the High Seas and the Area in ABNJ (Gjerde and Wright, 2019; Jaeckel, 2020b; Tunnicliffe et al., 2020; Warner, 2020). Therefore, operationalising EAM is a necessity for ABNJ as raised very early on in the multilateral BBNJ discussions (De Lucia, 2019). In the current draft text of the proposed BBNJ Instrument⁴, the ecosystem approach is one of several general guiding approaches required for its implementation and is also explicitly considered for the identification, review and monitoring of areas that require protection (BBNJ November 2019 Draft Text, arts. 5.f, 16.1, and 21.4). However, the current draft text of the proposed BBNJ Instrument does not provide more information with regard to how EAM could be operationalised.

The same vagueness applies to the ISA, which is responsible for the development of a set of regulations that would govern the future exploitation of mineral resources in the Area. In its current draft of the exploitation regulations, the ISA commits to implementing EAM as one of its governance principles (International Seabed Authority, 2019b, Part IV). Other than that, however, the ISA does not expressly recognise EAM as the best management practice at hand to cope with the multiple and

⁴The draft text will be updated by the president of the IGC ahead of the IGC 5 meeting, tentatively planned for August 2022.

interrelated spatial and temporal environmental effects to be caused by mining (Guilhon et al., 2020). Although some elements of EAM can be traced in ISA documents that feature within its Mining Code and in the ISA's regional environmental management plan for the Clarion-Clipperton Zone (International Seabed Authority, 2011; International Seabed Authority, 2012), which is to be '*consistent with the principles of integrated ecosystem-based management*', no practical steps have been taken to implement or address EAM throughout the ISA regulations or recommendations (Guilhon et al., 2020).

In order to recognize the implications of an EAM for practical management, it is important to understand the general premises of the approach and how it contrasts with traditional sectoral approaches. For this purpose, it will be useful to rely on key principles or elements that are typically associated with the definition of EAM as identified by Long et al. (2015) (highlighted in bold throughout the text). While the latter focus on reducing/minimising environmental impacts through measures at the source, usually after the demonstration of unacceptable effects, EAM is a comprehensive, cross-sectoral approach which implements the **precautionary approach** throughout, based on agreed **long-term vision, strategic goals and management objectives**. EAM has the complexities of the ecosystems affected by human activities in view and therefore acts on **best available information from all sources (use of scientific and other types of knowledge)**, while acknowledging the existence of uncertainties. In line with EAM, the collection of data should **account for natural dynamics and connectivity i.e.**, on the structure and function of the respective ecosystems, as well as all economic and other pressures, including climate change (consideration of **cumulative impacts and effects on adjacent ecosystems**), acting on **various temporal and spatial scales**. A core management element is a transparent, inclusive and comprehensive assessment on baseline conditions, as well as of pressures and effects on the ecosystems in question prior to decision-making on policies, plans and programmes, e.g. through Strategic Environmental Assessment (SEA). Other key elements are the distillation of complex ecosystem information into digestible ecosystem state and development indicators; the establishment of reference levels on which management decisions can be made; and clear protocols to **evaluate tradeoffs** (Link and Browman, 2017). Based on the results from an **appropriate monitoring strategy**, an **adaptive management cycle** includes a periodic review of the environmental situation and of the suite of measures. **Transparency and stakeholder involvement** are important process standards for EAM governance (Cormier et al., 2017; Cormier, 2019). Collaborative and coordinated approaches, **integrated** and across sectors, will likely be more effective to attain the interrelated ocean, biodiversity, and climate targets (Stephenson et al., 2019). In consonance with EAM, decisions taken should **reflect societal choice**.

Despite the range of options around EAM definition and operationalization all over the world, common elements of EAM have been identified and used to identify gaps and recommend opportunities for improvement (Guilhon et al., 2020;

Xavier et al., 2022). In the following, we juxtapose REMP and the provisions of the proposed BBNJ Instrument in context with some elements (principles)⁵ (identified by Long et al. (2015) and subsequently relied upon by Guilhon et al. (2020) in the context of deep seabed mining) as an exercise to discuss challenges and opportunities for enhancing EAM in ABNJ. The pathways taken to discuss EAM throughout the text was drawn from the authors' knowledge and experience on the ISA and BBNJ regimes, as well as from the literature.

3 ENVIRONMENTAL GOVERNANCE OF DEEP SEABED MINING IN THE AREA AND THE ESTABLISHMENT OF REGIONAL ENVIRONMENTAL MANAGEMENT PLANS

This section provides an overview of the environmental governance of deep seabed mining in the Area, including the establishment of Regional Environmental Management Plans. In the light of increasing activities taking place in ABNJ and the inherent environmental risks linked to mining activities in the Area, this section underscores the great potential of REMP in contributing towards an integrated and ecosystem-based management and discusses current limitations concerning the development and implementation process of REMP under the ISA.

3.1 Environmental Governance of Deep Seabed Mining in the Area

The International Seabed Authority, ISA, is an international organisation made up of 167 member States and the EU, which was established through UNCLOS in 1994. Through the ISA, States collectively determine the access to the mineral resources of the Area and any activities in connection with mineral exploration and commercial exploitation that will take place there. Rules, regulations, and procedures therefore apply only to such activities, but the related environmental effects will extend to both the seafloor and the water column. The obligation '*to ensure effective protection for the marine environment from harmful effects which may arise from such activities*' (UNCLOS Art. 145) is therefore a critical one, given the deleterious effects that mining activities could cause to the marine environment, especially once they take place at large, commercial scales for decades to come.

Since the 1970s, multiple mineral exploration operations have been underway in all ocean basins both within and beyond national jurisdiction, some accompanied by scientific disturbance experiments (Okamoto, 2005; Jones et al., 2017; Sparenberg, 2019). No experience exists to date with mining

⁵These EAM elements (principles) broadly reflect the principles set out by CBD (2000) COP 5 Decision V/6, however are informed by an extensive literature search, covering academic, government and NGO sources.

mineral substrates in the deep-sea on a commercially relevant scale, which makes it difficult to estimate the potential impacts of multiple operations over time and space. Therefore, there are considerable knowledge gaps regarding the possible long-term and deleterious effects of deep seabed mining on deep-sea and open ocean ecosystems which may threaten crucial ecosystem functions and services, including provisioning services (e.g. fish, genetic resources), regulating services (carbon cycle), or cultural services (science and discovery) (Le et al., 2017). Not only do we lack an understanding of the mining-induced consequences of biodiversity loss (Van Dover et al., 2017; Niner et al., 2018), loss of unique habitats, such as hydrothermal vents (Van Dover, 2011; Van Dover, 2014; Van Dover et al., 2018), and loss of irreplaceable seamount fauna (Schlacher et al., 2013; Morgan et al., 2015; Gollner et al., 2017; Clark et al., 2019), but also the procedures needed to gain knowledge on such consequences have not yet been established (Ginzky et al., 2020). This is in stark contradiction to the global goal set by the international community to halt the loss of biodiversity, ‘*end the war on nature*’⁶ and ‘*live in harmony with nature*’.⁷ Concerns are growing as to whether deep seabed mining in the Area at any scale could be environmentally responsible (Beaulieu et al., 2017; Kim, 2017; Van Dover et al., 2017; Niner et al., 2018; Mickelson, 2019; Levin et al., 2020a; Smith et al., 2020b). Small-scale experiments suggest also that mining will lead to the long-term reduction of carbon cycling and deposition in the affected benthic food-web (Stratmann et al., 2018; Sweetman et al., 2018; de Jonge et al., 2020), effectively reducing the ocean’s carbon storage capacities to an as yet unknown degree.

Despite these risks and uncertainties, the ISA is progressing with mineral exploration contracting,⁸ and moving towards finalizing the legislative framework for enabling future mineral exploitation, ongoing since 2014.⁹ The so-called Mining Code, to be adopted before decisions can be made on the first applications for exploitation activities, comprises rules, regulations and procedures framing the contract conditions for potential miners: a) the (eventually resource-specific) exploitation regulations to set the broad binding framework for contractors and procedures to be followed by ISA; b) binding standards and non-binding guidelines on among others environmental issues.¹⁰ The ISA also has to enforce contractor compliance (Komaki and Fluharty, 2020), including to establish a body of inspectors for this purpose.

⁶A. Guterres ‘State of the Planet’, <https://www.bbc.com/news/science-environment-55147647>.

⁷2050 Vision of the CBD Post-2020 Global Biodiversity Framework, see: <https://www.cbd.int/decision/cop/?id=12268>.

⁸See <https://www.isa.org.jm/exploration-contracts>: As of 2021, 31 exploration contracts with 22 contractors exist for three types of mineral-rich substrates (polymetallic nodules, seafloor massive sulphides and cobalt-rich ferromanganese crusts) in all ocean basins.

⁹<https://www.isa.org.jm/mining-code/ongoing-development-regulations-exploitation-mineral-resources-area>. For an overview of possible policy instruments and incentives which help the dual goal of ‘promoting DSM while also protecting the environment’ see Lodge et al. (2019).

¹⁰See <https://www.isa.org.jm/mining-code/standards-and-guidelines>. At present, the proposed standards do not exceed the broad requirements of the draft regulations; guidelines are of procedural nature.

The ISA appears to be a weak regulator (Ginzky et al., 2020) in the latest draft exploitation regulations (International Seabed Authority, 2019b) which provide only a very general framework for environmentally relevant procedures, such as the obligation for applicants to submit an Environmental Impact Statement (EIS) to document and report the results of the environmental impact assessment process (EIA process), and an Environmental Management and Monitoring Plan. Normative standards for implementing effective environmental protection and mitigation measures in line with the obligations set by UNCLOS Articles 145 and 192 do not yet exist, and scientists are concerned that misconceptions about the implications of scientific uncertainties on the nature of the deep-sea environment and related scientific advice on the potential mining-related effects may unjustifiably increase the acceptability of mining (Smith et al., 2020a; Smith et al., 2020b). However, even though the Council of the ISA ultimately would decide on whether or not to approve a plan of work, the powers for the ISA to reject an application based on an insufficient EIS as yet not well defined, nor is there any indication of considering mining applications regionally for their cumulative impacts *vis à vis* sustainability or in view of an overall cost-benefit accounting.

3.2 Regional Environmental Management Plans

In the late 2000s, the scientific community raised an alarm over the cumulative impacts expected from multiple mining operations and proposed a regional representative network of mining exclusion zones (Wedding et al., 2013; Wedding et al., 2015). This led to the development of a first regional environmental management plan (REMP) for the CCZ in the Northeast Pacific (International Seabed Authority, 2011; International Seabed Authority, 2012), based on a set of guiding principles (incl. the precautionary approach, protection and preservation of the marine environment, prior impact assessments and transparency), a vision, as well as goals and objectives which include ‘*to facilitate mining while minimizing as far as practically possible the impact of seabed mining activities, and preserving and conserving marine biodiversity and ecosystem structure and function*’. In addition, it is worth highlighting that the CCZ-REMP include among its goals ‘*to manage the Clarion-Clipperton Zone consistent with the principles of integrated ecosystem-based management*’ [International Seabed Authority, 2011, para. 35 (d)]. Further, the plan includes a network of originally nine large, temporary exclusion zones outside the existing contract areas for polymetallic nodule exploration.¹¹

Encouraged by the United Nations General Assembly Resolution 68/70 adopted in 2013, and again with important impetus of the scientific community (Van Dover et al., 2012; Dunn et al., 2018), the ISA has also been progressing the development of REMPs on the Mid-Atlantic ridge in the North Atlantic,¹² and in the Western Pacific near the US Mariana

¹¹See further under 4.2.3.

¹²<https://www.isa.org.jm/workshop/workshop-regional-environmental-management-plan-area-northern-mid-atlantic-ridge>

Trench National Monument and the Exclusive Economic Zones of the United States, Japan, the Marshall Islands and Micronesia.¹³ In addition, preparations are ongoing for REMPs covering existing and potential contract areas in the Indian Ocean as well as the South Atlantic (ISBA/26/LTC/2, summarising the REMP activities of the ISA since 2012).¹⁴

REMPs are to date a non-binding policy instrument,¹⁵ defined as ‘a proactive area-based management tool to support informed decision-making that balances resource development with conservation’ and which help the ISA to meet its international conservation commitments, such as Aichi Biodiversity Target 11, by providing mechanisms for the identification and protection of ecologically representative subareas (International Seabed Authority, 2018b). Further, they are considered a tool for addressing the cumulative impacts of deep-seabed mining in those regions where exploration contracts have been issued (Lodge et al., 2014). The ISA policy reflects these ambitions in its high-level strategy, among others, to ‘Develop, implement and keep under review regional environmental assessments and management plans for all minerals provinces in the Area where exploration is taking place to ensure sufficient protection of the marine environment as required by, inter alia, article 145 and Part XII of the Convention’ (Strategic Direction 3.2, International Seabed Authority, 2018a; International Seabed Authority, 2020, underlined part missing in International Seabed Authority, 2020). Despite the high-level commitment to REMPs, there is still a need to tie them to the ISA decision-making framework (Jaeckel, 2016) and to give legal effect to the ways how REMPs shall be established and implemented across the Area. Here, a ISA environmental strategy could be instrumental in determining roles, responsibilities, procedures, as well as common criteria to be applied to all regional environmental assessments, and enabling the ISA’s dedicated technical expert body, the Legal and Technical Commission (LTC) itself to ‘prepare assessments of the environmental implications of activities in the Area’ [UNCLOS article 165(2) (d)] (Jaeckel, 2020b).

3.3 An Ecosystem Approach for Developing and Managing REMPs

Potentially, a regional management approach such as envisaged by the ISA provides tremendous opportunities for an EAM-consistent regionally integrated environmental governance in ABNJ, even if only pursued by one sectoral organisation (Christiansen and Singh, 2022 in press). Cormier (2019) distinguishes the ecosystem approach a) to governance, acting through policy making, b) to management, through protection and conservation objectives, and c) the operational ecosystem approach which delivers the operational control of activities and therefore the effective outcome of the governance regime. All three are important in

¹³ <https://www.isa.org.jm/workshop/workshop-regional-environmental-management-plan-area-northwest-pacific>

¹⁴ See https://isa.org.jm/files/files/documents/isba_26_ltc_2-e.pdf

¹⁵ See ISBA/25/C/4. There is ongoing debate on whether and how to make REMPs binding. For example, Germany submitted proposals to link the requirements set out in the draft regulations with the respective REMP ([ISBA/25/C/29, https://isa.org.jm/files/files/documents/isba25_c29-e_0.pdf]).

context with developing and managing REMPs, in particular if a tiered approach connects the project-level contracting with the global ISA policy (Jones et al., 2019; Jaeckel, 2020b).

An EAM-based REMP would have several general traits derived from the principles identified by (Long et al., 2015). Below, we discuss such traits that are important for integrated biodiversity conservation and management in ABNJ.

3.3.1 Long-Term Environmental Vision, Strategic Goals and Objectives

An important aspect of a EAM-based REMP is the ambition to manage deep seabed mining activities transparently towards pre-agreed **long-term environmental quality goals and objectives** broken down from the ISA’s environmental mandate to ‘ensure effective protection for the marine environment from harmful effects which may arise’ from activities in the Area (UNCLOS Art. 145) such as to prevent, reduce and control pollution and other hazards, and prevent damage to the flora and fauna and interference with the ecological balance (Tunncliffe et al., 2020). Such goal setting is to some extent value-based and therefore needs to be **stakeholder-inclusive** (Jaeckel, 2017b). Therefore, in a region, it has to be decided how to break down the high-level global biodiversity conservation goals and commitments into measurable and achievable regional objectives and targets¹⁶ based on the regional environmental status and **cumulative pressures**. Any thresholds set and measures agreed in the REMP have to help achieve the desired outcome, and a periodic assessment of how the environmental status changes (in direction of the goals or away from it) should lead to a review of the REMP measures (e.g. **Figure 1**, Jaeckel, 2017a; Jaeckel, 2017b).

3.3.1.1 Current Status

The environmental management plan for the Clarion Clipperton Zone (CCZ EMP, International Seabed Authority, 2011; International Seabed Authority, 2012) includes a vision, goals, strategic aims and operational and management objectives for the entire region, contract areas and the areas of particular environmental interest, APEIs, which are exempt from mining. However, its vision is focussed on the enabling of mining (sustainable exploitation, facilitate mining, holistic approach to regional management, paras. 32-34, respectively) rather than to ‘ensure effective protection for the marine environment from harmful effects which may arise from’ activities in the Area, as defined in the ISA mandate in Article 145 UNCLOS. While again directed to exploitation [para. 35(a)], the CCZ EMP goals also make reference to the goals and targets set out in the Plan of Implementation of the World Summit on Sustainable Development [para. 35(b), WSSD, 2002], including ‘to halt the loss of biodiversity’ and ‘to establish ecosystem approaches to management’. Further the goals include to ‘maintain regional biodiversity, ecosystem structure and ecosystem function across

¹⁶ Should preferably be SMART: Specific-Measurable-Achievable-Relevant-Time-bound. See e.g. ICES (2005).

the *Clarion-Clipperton Zone*' [para. 35(c)], but only to 'enable the preservation of representative and unique marine ecosystems' [para. 35(e)].

At present, the ISA Strategic Plan 2019-2023 (International Seabed Authority, 2018a) while only partially reflecting the principles set out in the CCZ EMP, clearly acknowledges the extensive environmental protection mandate of UNCLOS as well as the goals of the 2030 Agenda (UN General Assembly, 2015), the Aichi Biodiversity targets (Convention on Biological Diversity, 2010), transparent and inclusive processes such as collaborative regional assessments and management plans (ISBA/24/A/10 Annex para.14). However, overarching environmental goals, objectives and measurable targets, though stressed by the ISA Council in 2018¹⁷ are as yet missing (Jaeckel, 2020b).

3.3.2 Stakeholder Values and Conflicting Uses of the Marine Environment

For an EAM-based REMP it is fundamental (Langlet and Rayfuse, 2018) that there is **stakeholder involvement** early on and all of the process and results are made public. Using a SEA-type procedure for the knowledge generation and assessment of *i.e.* the environmental state, pressures and threats for developing measures in the regions identified for developing REMP will be helpful to make REMP development **transparent** and accountable, as SEA ideally investigates the policy/plan/programme together with stakeholders while it is still under development and can be adjusted.

Early involvement of all those who may directly or indirectly be affected by the effects of mining operations in the Area is crucial, as the mining activities endorsed by the ISA will add to an existing mix of ocean uses in ABNJ, including open ocean and deep water fishing, shipping, cable laying, and marine scientific research (Jouffray et al., 2020). User conflicts could arise through direct competition for space with other uses, such as with shipping, cable-laying, fishing and research (International Seabed Authority, 2019a), and with designated areas for conservation (Convention on Biological Diversity, 2014a; Johnson, 2019). Indeed, not only have the interests of the cable-laying industry been overlooked when contracting (International Seabed Authority, 2019a; Rayfuse, 2020), studies have also shown that fisheries could be impacted by mining activities in the Area (van der Grient and Drazen, 2021),¹⁸ and thus RFMOs and other stakeholders should actively participate in the work of the ISA, including REMP development, to ensure that their interests are protected.¹⁹

¹⁷ISA, Statement by the President of the Council on the work of the Council during the second part of the twenty-fourth session - Addendum, ISBA/24/C/8/Add.1, 25 July 2018. https://www.isa.org.jm/sites/default/files/files/documents/isba24c-8add1-en_0.pdf.

¹⁸<https://pasifika.news/2021/09/scientists-call-for-moratorium-on-ocean-mining-fearing-impact-on-pacific-tuna-fishery/>

¹⁹See e.g. opinion of European LDAC 2019, https://ldac.eu/images/EN_LDAC_Advice_on_Deepsea_Mining_R.04.19.WG5_May2019.pdf, and Joint LDAC-Pelagic-NWWAC Advice Deepsea mining in internationalwaters, 2021, https://ldac.eu/images/EN_Joint_LDAC_PELAC_NWWAC_Advice_Deepsea_Mining_Nov2021.pdf, <https://ldac.eu/en/publications/947-joint-ldac-pelac-nwwac-advice-on-deepsea-mining-in-international-waters>.

In addition to conflicts through competition for space, the deterioration of environmental quality may impair the opportunities of other users, e.g., fishing, or prospecting for marine genetic resources,²⁰ and which could also impact national waters and coastal communities (Dunn et al., 2017; Popova et al., 2019). Although beyond national jurisdiction, the potential mine sites in the Area and overlying High Seas are geographically by no means far from shore everywhere. For example, the CCZ and its multiple exploration contract areas border the Exclusive Economic Zones of Mexico, the US and Kiribati. In the Indian Ocean, the contracted mid-ocean ridge areas are immediately outside the waters of Seychelles, Mauritius, and the Chagos Archipelago. Here, the monsoon winds result in a tight connection between High Seas waters and African coastal waters (Popova et al., 2019). Popova et al. (2019) also demonstrate that, often unrelated to geographic distance, coastal regions are **connected** to ABNJ through notably larval dispersal and the potential dispersal of pollutants.

There may also be conflicting **goals**. In many ocean regions, regional seas conventions and RFMOs seek to improve the environmental status in waters under national jurisdiction and in some cases including ABNJ. For example, OSPAR and North-East Atlantic Fisheries Convention (NEAFC) have established networks of marine protected areas (MPAs) and bottom fishing closures, respectively, in ABNJ in the North-East Atlantic since 2010 (O'Leary et al., 2012) and are seeking cross-sectoral practical implementation of the MPA's conservation objectives through a so-called '*Collective Arrangement Between Competent International Organizations on Cooperation and Coordination Regarding Selected Area in Areas Beyond National Jurisdiction in the North East Atlantic*', formalised in 2014.²¹ Until today OSPAR and NEAFC are the only active partners (Rayfuse, 2020; Tang et al., 2021). Such MPAs and bottom fishing closures are however only binding on the respective contracting parties.

3.3.2.1 Current Status

The current level of interest of other sectoral organisations in participating in the REMP development seems limited, highlighting the current limitations of the sectoral approach. A further impediment relates to the fact that, to date, the rights and duties of the REMP managing organ and stakeholders are undefined and there is no agreed (and known) strategy for stakeholder engagement,²² including a response mechanism to stakeholder comments and suggestions. The currently envisaged method of stakeholder participation in the development of REMP is limited to two region-specific technical workshops with limited capacity and unclear participation criteria. There is a risk that the perceived lack of systematic stakeholder mapping may lead to an imbalance of stakeholders represented at workshops. There is no continuous

²⁰A recent example for the extremely high importance of preserving ecosystems and biodiversity for mankind was the test being used to diagnose the Covid-19 virus from marine genetic material derived from hydrothermal vents. <https://www.who.edu/news-insights/content/finding-answers-in-the-ocean/>

²¹<https://www.ospar.org/news/collective-arrangement>

²²A first draft by the ISA Secretariat was sent out for stakeholder comments in spring 2021, but no action since then. It focusses exclusively on public engagement and seeks to restrict opportunities for effective participation by ISA States and observers.

workstream foreseen to which stakeholders could provide input, commenting will only once be possible on the draft REMP document. Neither an overarching advisory panel for all regions, nor region-specific advisory committees are foreseen – such mechanisms could provide for a broader representation of stakeholder groups other than scientific experts.

3.3.3 Integration Through Comprehensive Environmental Assessments

While ISA only has the mandate to manage mining-related activities in the Area, these cannot be seen in isolation and their impacts must be assessed and managed in context with all other pressures in the region. Tiered strategic (SEA) or Regional Environmental Assessment (REA) processes are recommended for implementing such EAM-based REMP (Jones et al., 2019), because they come with a toolbox based on existing national (Government of Ireland, 2004) and regional experiences (European Commission, 2003; United Nations, 2003; OECD-DAC, 2006), as well as the Guidance of CBD for ABNJ (Convention on Biological Diversity, 2012). A state-of-the-art regional environmental report provides the basis for decision-making on measures as to be laid down in the regional environmental management plan. The environmental report should be synthesised from all available sources and includes **all available information** on environmental status, pressures and threats, eventually problems and user-conflicts as well as **uncertainties**. Based on the pre-agreed environmental goals, the risks and expected environmental effects of mining-related activities from one or more commercial mines are predicted. Taking account of alternative actions with respect to scale, intensity, frequency, technology change or no action option, the comprehensive assessment should result in measures necessary to provide for effective protection of the marine environment from harmful effects from mining.

3.3.3.1 Current Status

The design of all ISA REMP to be established in the future is as yet uncertain, however there are as yet no indications that comprehensive assessment process will be included. In preparation of the Mid Atlantic Ridge EMP, a ‘Regional Environmental Assessment, REA’ report was compiled (Weaver et al., 2019), which provides a scientific overview of the region at large, including possible impacts from mining and broad cumulative impacts, but not considering existing protected areas, fisheries closures and EBSAs. The REA is a scientific exercise only with very limited information on the contract areas. Neither a risk assessment nor an assessment of the significance of the threats from mining are included, which also reflects the uncertainties of future mining operations. However, the *ad hoc* expert-involving phase prior to drafting the REMP is now over. In spring 2022, a LTC draft REMP has been opened for consultation.²³ It remains to be seen how the cumulative impact assessments envisaged in the ISA Secretariat’s Guidance to REMP (International Seabed

Authority Secretariat, 2019), and the CCZ EMP (International Seabed Authority, 2011; International Seabed Authority, 2012) will be realised.

3.3.4 Precautionary Measures in Light of Uncertainties

The **precautionary approach** is at the heart of EAM and is a legally binding obligation on ISA, States and contractors (ITLOS, 2011). Its implementation requires effective and proportionate ‘*protective measures to be embedded in decision-making procedures and supported by institutional arrangements that facilitate risk assessment and risk management in line with the precautionary principle*’ (Jaeckel, 2015; Jaeckel, 2017b). Therefore, such measures must not only be based on **best available knowledge** from all sources, taking account of **stakeholder** and **scientific** advice, but also account for the **uncertainties** prevailing in relation to the deep ocean in general (Amon et al., 2022), and the mining technologies employed in particular, which together determine the scale and gravity of impact to be expected on the deep-sea ecosystems. This should result in a stepwise process to fill identified knowledge gaps and lead to decisions which err on the side of precaution (Amon et al., 2022). Ideally, a management cycle allows for corrective action based on new knowledge and experience, for example by adapting environmental standards, thresholds or spatial measures (Jaeckel, 2016).

In the absence of detailed knowledge, a REMP could encompass spatial and activity-based measures based on the unique characteristics of the particular environment in question, including for example to exempt all active hydrothermal vent fields from mining activities (Gollner et al., 2021), the designation of representative no-mining zones (Dunn et al., 2018), the adoption of a staged approach to mining (Niner et al., 2018; Craik, 2020; Smith et al., 2020b), and limiting the number of contracts/mine sites at any one time to control the extent of environmental impacts and preserve mine sites for future generations (Jaeckel et al., 2017). In the following, precautionary spatial measures in the context of REMP will be discussed by examining two specific themes: the designation of Areas of Particular Environmental Interest (APEIs) and respect for protective measures established in ABNJ by other bodies.

3.3.4.1 Areas of Particular Environmental Interest

In the above-mentioned REMP for the Clarion-Clipperton Zone (International Seabed Authority, 2011; International Seabed Authority, 2012), the only visible and widely acknowledged precautionary management measure has been the designation of nine sites of 400x400 km each, known as ‘Areas of Particular Environmental Interest’. The purpose of APEIs is to provide a safeguard for maintaining key ecological processes once commercial mineral extraction will take place in the region. Although APEIs are currently not subjected to exploration or exploitation activities, these are not permanently protected areas. Consequently, it is not unforeseeable that some of such sites may be opened to mining activities in future.

3.3.4.2 Current Status

In the CCZ, APEIs were originally selected to be biogeographically broadly representative of the region, but had

²³ <https://isa.org/jm/news/draft-regional-environmental-management-plan-northern-mid-atlantic-ridge-open-consultation>

to be relocated to outside of the main manganese nodule belt (where the densest occurrences of nodules are), so as not to interfere with actual or potential exploration contract areas (Wedding et al., 2013; Wedding et al., 2015), are therefore not representative of the future mine sites and have limited similarity to the nearest contract areas (McQuaid et al., 2020; Jones et al., 2021; Washburn et al., 2021). Some of the gaps of the prior suite of sites were filled in December 2021, when four new APEIs outside contracted areas have been adopted by the ISA Council, although not providing the same buffer zones.²⁴ Other operational and scientific uncertainties concern e.g. the underlying assumption on sediment plume dispersal, population propagation and exchange, as well as the minimum size for an independent, unaffected reserve area (Cormier, 2019).

In the case of the northern Mid-Atlantic ridge REMP, a science-based mechanism for selecting a large scale, representative set of APEIs, proposed by Dunn et al. (2018), was not taken into consideration. Instead, new protection categories were created covering known active hydrothermal vent fields (*'sites in need of protection'*), hadal fracture zones (*'areas in need of protection'*), inferred vent sites and predicted cold-water coral habitat (*'sites/areas in need of precaution'*), which replace rather than complement the broad spatial protection of representative features with conservation of small-scale knowledge-based evidence of vulnerable marine ecosystems (VMEs), the so-called 'fine filter' approach (Gollner et al., 2021; International Seabed Authority, 2021).²⁵ No details are known of the other two REMPs under development in the Indian and western Pacific Ocean (see above). However, the development of both will be facilitated by exploration contractors from India and China, respectively, which may indicate a conflict of interest.

3.3.4.3 Respect Spatial Designations in ABNJ by Other Bodies

Some precautionary measures do exist which apply to living resources and ecosystems in ABNJ globally. For example, hydrothermal vent fields and seamount ecosystems, which are also targeted for mining the seafloor massive sulfide (SMS) deposits and cobalt-rich crust, respectively, have been identified as potentially Vulnerable Marine Ecosystems (VMEs) by the UN General Assembly (among others), which are to be protected from significant adverse impacts from deep-water fishing beyond and partly within national jurisdiction (UNGA 2006; FAO, 2009; Van Dover et al., 2018). While these resolutions and guidelines are not legally binding, their implementation in national laws and regional bodies (e.g. within the EU and several RFMOs) reflect a widespread consensus on their need for protection from a wide range of actors globally (FAO, 2016) in line with an agreed set of criteria

²⁴ See 2021 Review of the implementation of the Environmental Management Plan for the Clarion-Clipperton Zone ISBA/26/C/43; https://isa.org/jm/files/files/documents/ISBA_26_C_43-2110787E.pdf

²⁵ See ISA workshop report at https://isa.org/jm/files/files/documents/Final_Draft_workshop_report-nMAR_REMP.pdf. The categories were pre-decided by ISA LTC and Secretariat, not based on scientific proposal. An LTC proposal for an Atlantic Ridge REMP is yet to be recommended to the Council for approval.

and precautionary measures. A similar set of criteria has been agreed by the parties of the CBD to identify Ecologically or Biologically Significant Marine Areas (EBSAs), an also non-binding precautionary spatial designation in ABNJ (Secretariat of the Convention on Biological Diversity, 2009; Convention on Biological Diversity, 2014a).²⁶ Although these EBSAs have no formal protective status, their purpose is to inform the future development of MPAs in ABNJ.

3.3.4.4 Current Status

Several of the broadly identified ISA REMP regions include or neighbour EBSAs or other types of area-based measures. As an example, we highlight the ISA exploration contract areas on the northern Mid-Atlantic Ridge, which give rise to concern that mineral exploration and later exploitation will entail a risk of significant adverse impacts for the ecosystems associated with the active and inactive hydrothermal vent fields, which have all been designated as EBSA (Convention on Biological Diversity, 2014a; Convention on Biological Diversity, 2014b). A review by Gollner et al. (2021) highlights the uniqueness or rarity of these fields, their functional significance and fragility, as well as life-history traits that make recovery difficult. In addition, one site, the 'Lost City' hydrothermal vent field has been shortlisted as an '*outstanding universal value*' World heritage Site in 2016 (Johnson, 2019). Notwithstanding, in August 2017, a Plan of Work for exploration of polymetallic sulphides along the Mid-Atlantic Ridge south of the Azores presented by Poland was approved (ISBA/23/C/19/Rev.1), based on a recommendation of the ISA's LTC, which did not specify any particular environmental concerns (ISBA/23/C/11).

3.4 Steps to Enhance Coherence in ABNJ

For REMPs to be an effective instrument in control over mining-related impacts and cumulative environmental degradation and to prevent biodiversity loss, the plan would need to be established in a systematic, stakeholder-inclusive, holistic manner (Christiansen and Singh, 2022 in press). A more standardised approach to the development of REMPs under development in all ocean basins would foster coherence in ABNJ governance and with the global biodiversity agenda and support transparency and coordination. This could entail, for example: a) the scope and procedure of the REMPs; b) an agreed purpose, overall environmental goals and objectives, and principles; c) the regulatory framework for REMPs; d) the minimum requirements in the delivery of the management plan; and e) stakeholder engagement, participation and interaction with other management authorities in these regions (Christiansen

²⁶ <https://www.cbd.int/ebsa/>. The designation of EBSAs within and beyond national jurisdiction according to scientific criteria shall aid the implementation of the global goal to halt the loss/decline of biodiversity and is therefore the first step towards protecting these ocean areas. It precedes the option to designate legally binding spatial measures, as under negotiation in the frame of the proposed BBNJ Instrument. The website holds documentation on each EBSA.

²⁷ See ISBA/26/C/5 and ISBA/26/C/6 at <https://isa.org/jm/files/files/documents/isba-26c-6-en.pdf> and <https://isa.org/jm/files/files/documents/isba-26c-7-en.pdf>. In November 2021, there is as yet no response to the Council request to LTC for consideration dated February 2020.

and Singh, 2020; Christiansen and Singh, 2022 in press). In this respect, several Member States of the ISA have recognised the shortcomings in the current process and proposed ISA to adopt a standardised approach for processes, procedures and implementation of all REMPs (submission of Germany, The Netherlands and Costa Rica to the ISA Council 2020²⁷ following an international expert workshop held in Hamburg, Germany, in November 2019).²⁸ This includes a suggestion to establish independent, *ad-hoc* expert bodies to take charge of the REMP development process for each region, as well as to consider REMPs as being legally-binding as opposed to guidance tools (i.e. the ISA could reject mining applications if it is inconsistent with the relevant REMP). **Table 1**, in the **Supplementary Materials** (2) specifies in more detail the comparison between the current practice of REMP development and a design which would bring REMP establishment and processes in line with an ecosystem approach to management, EAM, in line with the submission made by Germany/The Netherlands/Costa Rica to the ISA Council 2020 (Christiansen and Singh, 2020; Christiansen and Singh, 2022 in press). Technically, the regional expert bodies would be best suited to prepare the groundwork to develop and maintain up-to-date draft REMPs, including organisation of the process, information gathering, stakeholder mapping, management and consultation, drafting, and ideally maintaining a clearing house mechanism. The regional expert bodies could ensure communication and integration of the different sectoral organisations directly, cooperate with existing regional frameworks, or where these do not exist, the REMP could serve as a platform for inter-sectoral cooperation and conflict resolution. The desired outcome is an integrated environmental management of a certain ocean region under shared responsibilities.

REMPs could and should contribute to a globally coherent and systematic biodiversity conservation planning in ABNJ, including through precautionary spatial protection measures. To achieve this it is suggested that ISA rules, regulations and procedures:

- a. Require applicants and contractors a) to report, map and publish any species and features in their (proposed) contract areas, which are or could be designated as VMEs, EBSAs, or MPAs; b) to assess the vulnerability of these features to mining-related impacts, in line with the criteria and methods for protecting hydrothermal vents and seamount ecosystems from the effects of bottom fishing to minerals mining; c) to identify potential conflicts with other users, values, and traditional owners; d) to detail any gaps in knowledge and uncertainties.
- b. Exclude features described as EBSAs and VMEs, as well as existing or planned MPAs, from the Plans of Work of ISA

contractors²⁹ (see also Van Dover et al., 2018; Johnson, 2019). This can best be achieved in a transparent and inclusive spatial planning process (Wright et al., 2019). As a minimum special reporting obligations should apply during exploration.

- c. Require ISA to maintain systematic and transparent communication processes with governance bodies, management authorities and stakeholders in the respective regions and contract areas, including a notification of adjacent coastal States and existing management and governance entities in the respective region of the intent to develop a REMP.³⁰
- d. Establish a clearing house mechanism to provide for transparency, access to information and to establish communication pathways between science, stakeholders and policy, preferably compatible with the clearing house mechanism to be established under the proposed BBNJ Instrument.
- e. Design REMP development, monitoring and review to be based on SEA-like comprehensive assessments which could also inform regional governance in ABNJ.
- f. Make the REMP an effective instrument through measures applicable to all ISA contractors in the region which are guided by the precautionary approach and long-term environmental objectives, in line with the standards set out by the proposed BBNJ Instrument;
- g. Provide for adaptive management cycles for REMPs, including continuous monitoring and periodic assessment and review from the start.
- h. Design REMPs to provide for integration, consideration, and reconciliation of all relevant aspects of mining operations (economic, social and ecological), including a well-informed analysis of the benefits and (environmental) costs of mining.

If designed as a legally binding instrument, REMPs would allow the ISA to function as a proper regulator, *i.e.* through feedback of REMP **cumulative** environmental assessments on regional ISA contracting and the respective environmental standards for activities (Jaeckel, 2016), including Best Environmental Practice and the use of Best Available Technologies. The regional level may be best suited to set precautionary thresholds for 'effective protection', 'harmful effects' and 'serious harm', identify the appropriate indicators for a regional **monitoring** programme, and carry out the necessary environmental assessments that leads to an **integrated management** and embrace reviews in an **adaptive review** cycle. In addition to the suggestions above, directed at a ISA to produce more EAM-conform REMPs, the proposed BBNJ Instrument could eventually provide a critical impetus for integrating sectoral management tools such as the ISA REMPs, into the global biodiversity conservation agenda in ABNJ.

²⁸ See <https://www.umweltbundesamt.de/international-workshop-remphamburg-nov-2019>.

²⁹ Nodule Exploration Regs 31(4) requires 'The Commission shall develop and implement procedures for determining, ..., whether proposed exploration activities in the Area would have serious harmful effects on vulnerable marine ecosystems and ensure that, if it is determined that certain proposed exploration activities would have serious harmful effects on vulnerable marine ecosystems, those activities are managed to prevent such effects or not authorized to proceed.'

³⁰ Indicated by Mr. Michael Lodge, Secretary-General of the International Seabed Authority. Statement at the first negotiation session on the proposed BBNJ Instrument. New York, 07 September 2018. <https://isa.org.jm/files/documents/EN/SG-Stats/abmt-bbnj.pdf>

4 THE PROPOSED BBNJ INSTRUMENT AS AN OPPORTUNITY TO ENHANCE COHERENCE OF REMPS WITH ABNJ GOVERNANCE

In parallel to the ISA discussions on a deep sea mining regime, the negotiations on the proposed BBNJ Instrument, which build on over a decade of high level discussions at the United Nations, focus on four ‘package elements’ identified by States in 2011, namely: a) marine genetic resources (MGRs), including questions on the sharing of benefits; b) measures such as area-based management tools (ABMTs), including marine protected areas (MPAs); c) environmental impact assessments (EIAs); and d) capacity building and the transfer of marine technology (UN Resolution 72/249, para. 2), is ongoing. These four elements must be negotiated and considered ‘[...] *in particular, together and as a whole* [...]’ (UN Resolution 72/249, para. 2) and will be complemented by cross-cutting considerations on institutional arrangements, guiding principles and approaches, international cooperation, implementation, and compliance as well as the settlement of disputes. However, mechanisms to address biodiversity conservation as a systemic concern in ABNJ are not on the negotiation table today (De Santo et al., 2019). To date, four rounds of negotiations have taken place, with a fifth round of negotiations planned for August 2022. The latest draft text of the proposed BBNJ Instrument that serves as the basis for the discussion in this paper dates from November 2019.³¹ Although parts of this draft text are in ‘square brackets’ and will likely change after the next negotiation round, it still allows in its current form to provide considerations for promoting and enhancing coherence and cross-sectoral collaboration in ABNJ premised on an ecosystem approach to management (EAM).

4.1 Current Reflection of EAM in the Draft BBNJ Instrument

The need for EAM was raised very early on in the multilateral BBNJ discussions (De Lucia, 2015). In the current draft text of the proposed BBNJ Instrument, the ecosystem approach is one of several general guiding approaches required for the implementation of the proposed BBNJ Instrument, and one that is also currently explicitly considered for the identification of marine areas that require protection as well as their review and monitoring (BBNJ November 2019 Draft Text, arts. 5.f, 16.1, and 21.4). Moreover, elements in consonance with EAM (Long et al., 2015) – adopting the polluters-pay principle, acting **precautionary**, adopting an **integrated approach**, using the **best knowledge** available (both scientific and traditional), considering the principle of **equity**, and adopting an approach built upon ecosystem **resilience and restoration** of ecosystem integrity – are also currently proposed as general guidance in the draft text of the proposed BBNJ Agreement (BBNJ November

2019, Draft Text, art.5). Strengthened cooperation between relevant instruments and organisations is also required in achieving the **overarching objective** of the proposed BBNJ Instrument of conserving and sustainably using biodiversity in ABNJ (BBNJ November 2019 Draft Text, arts. 2 and 6), including as part of the logic to the establishment of protected areas that will further require **monitoring and review**, and to the establishment of **coordination and consultation** mechanisms with a view to achieve one of the proposed objectives of ecosystem restoration and rehabilitation (BBNJ November 2019 Draft Text, arts. 14.e, 15.3, 16.1 and 21.4). However, the current draft text of the proposed BBNJ Instrument does not provide more information with regard to how the needed cooperation could be operationalised.

4.2 Steps to Enhance the Coherence of REMPs With the Proposed BBNJ Instrument Through EAM

The environmental management of the ISA in the Area, in particular through REMPs, needs to be intertwined with the overarching intentions for the negotiations on the proposed BBNJ Instrument, namely to build an effective governance framework for the protection of biodiversity in ABNJ. EAM-based governance could provide the necessary foundation, however, several key challenges to sectoral interplay have been identified by (Alexander and Haward, 2019) who recommend to a) create co-ordinating structures which operate across sectors, b) foster means of inter-sectoral communication and data-sharing, c) design participation processes to facilitate broad-scale participation. Further challenges consist in the limited mandate and governance structure of sectoral organisations (Matz-Lück and Fuchs, 2014), the likely imbalance of powers and means among stakeholders, and the need to bridge the communication divide between policy and science as well as to resource users (Langlet and Rayfuse, 2018; Amon et al., 2022). These challenges can only be overcome by inclusive, collaborative processes which are allowed sufficient time to mature (Slater and MacDonald, 2018).

Provided there will be agreement on strong provisions, the future instrument could eventually deliver the framework for steering sectoral and regional management in ABNJ through high-level conservation vision and goals, supported by a mandate for active interplay management between relevant bodies and organizing the collective multilateral work, including through area-based management tools (ABMTs), as well as processes for the application, implementation and monitoring of environmental impact assessments (EIAs) and strategic impact assessments (SEAs).³² Such a polycentric approach (Gjerde and Yadav, 2021) based on a strong and visionary BBNJ Instrument is highly desired. Ideally, parties to the proposed BBNJ

³¹ See: <https://undocs.org/en/a/conf.232/2020/3>.

³² The considerations on marine genetic resources, usually found on the seafloor, the Area, and often associated to the mineral substrates of interest to ISA parties, are also highly relevant in context with developing a comprehensive, integrated management of biodiversity conservation and use in ABNJ (Tladi, 2015b; Salpin, 2016). Not discussed here.

Instrument would be in charge of coordination, integration and enforcement of coherent synergistic and verifiable (inter-) actions by the multitude of competent actors that individually and collectively strive to contribute towards achieving the overarching aims and ambitions of the Instrument, taking into account present and future challenges as well as the implications of climate change in all decisions.

This section specifically looks into options for enhancing the coherence between REMPs and the proposed BBNJ Instrument through an EAM lens, but the suggestions made in this section could be applied also to other sectors and more broadly for strengthening ABNJ governance in general. Recommendations made in this section relate to: 1. The coordinating role of ambitious **principles and goals** for biodiversity conservation in ABNJ; 2. The need for **collaborative arrangements** to achieve **integrated ocean governance**; and 3. Integration through **comprehensive environmental assessments**.

4.2.1 The Coordinating Role of Ambitious Principles and Goals

As highlighted by Gjerde et al. (2018), ‘a common goal or purpose, participatory, and inclusive decision-making and coordination, and appropriate distribution of competence between the global and regional/sectoral levels’ would enhance successful cross-sectoral cooperation. Therefore, one way to stimulate more coherent governance processes and interplay between the regimes of the Area and the High Seas could be shared norms by way of parties adopting a common vision and strategic goals to biodiversity conservation in the proposed BBNJ Instrument. The vision- and goal-setting in the proposed BBNJ Instrument could influence the ISA’s efforts to comply with its mandate to take measures to ‘ensure effective protection for the marine environment from harmful effects which may arise from [such] activities in the Area’. With the adoption of the proposed BBNJ Instrument, States will set new norms for biodiversity protection in ABNJ that will also inform processes in other competent management bodies in ABNJ. ISA will have to assess and value the risks and environmental costs to be expected from commercial mining operations against these norms and biodiversity conservation ambitions. A stronger emphasis on protection could lead e.g. to a precautionary halt, a slow or small-scale start of activities, the prevention of mining in certain areas or regions, or other precautionary measures embedded in REMPs (see 4.3).

4.2.1.1 Current Status in Draft Text³³

So far, the general objective of the current draft text of the proposed BBNJ Instrument under which all States shall

cooperate is rather modest in its ambition and lacks in elaborating on a stronger and more assertive overall purpose of the conservation and sustainable use of marine biodiversity. Such a purpose could be for instance a) to ensure healthy and productive ocean,³⁴ and b) to increase the resilience of ocean ecosystems to climate change,³⁵ c) to initiate the ecological recovery of the ocean to meet the needs of present and future generations. The adoption of wording to highlight the link between biodiversity, climate, and a healthy and productive ocean in the objective of the future instrument, as well as in its Preamble, is crucial to open wide the necessity of cross-sectoral coherence.

4.2.1.2 Strengthening the BBNJ Instrument in Line With EAM

To emphasise the overarching concern for long-term ocean health, the explicit recognition of the conservation of biodiversity as a ‘*common concern of humankind*’ should be added to the Preamble of the proposed BBNJ Instrument in the same way as in the CBD Preamble. This relates to certain key principles of interest to States, namely: intergenerational equity, international solidarity, shared decision making and accountability, and benefit and burden sharing through financial cooperation (Bowling et al., 2016). Intergenerational equity should be the guiding principle for determining a common understanding of and which actions are required to ‘*sustainably manage, and protect marine and coastal ecosystems...*’ in the High Seas and the Area alike (UN General Assembly, 2013; Bourrel et al., 2016; Doorn, 2016). In this line, ‘*environmental stewardship*’ should be another key principle to be applied throughout the proposed BBNJ Instrument to help implement a sustainable management of the natural environment, which is precautionary, integrated, and complementary, balancing different rights and interests, through the shared responsibility of present generations to maintain and improve the environmental status for future generations³⁶ (Ridings, 2018). This would complement the intergenerational equity and preservation norms of common heritage of mankind (Tladi, 2015a).

Further, we suggest that a long-term vision be agreed in the proposed BBNJ Instrument, e.g. incorporated in the preamble, building on the proposed 2050 vision and goals of the CBD Post-2020 Global Biodiversity Framework ‘*By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people*’ (Convention on Biological Diversity, 2020). Furthermore, clear links to Agenda 2030 and its Sustainable Development Goals (SDG), particularly SDG 14 on Oceans and Seas, could be made in the proposed BBNJ Instrument to streamline these global processes. Strategic goals and objectives, such as proposed by Tunnicliffe et al. (2020) will be needed to operationalise measures under the proposed BBNJ Instrument. For example, the strategic goals should include to take action to ‘*strengthen [their] resilience and take action for*

³³ See supplementary material (3) for the full text of the articles cited as in the Revised draft text of an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (A/CONF.232/2020/3, 18 November 2019).

³⁴ Compare SDG 14.2.

³⁵ As described by Yadav and Gjerde (2020).

³⁶ This corresponds to strong sustainability, as defined by e.g. Neumann et al. (2017).

[their] restoration,' as in SDG 14.2 of the 2030 Agenda (UN General Assembly, 2015).³⁷

While the Preamble of the proposed BBNJ Instrument would clearly set the tone for the agreement the main text needs to give effect to these intentions made in the Preamble. This relates e.g. to provisions to allow for these visions, goals and objectives to be periodically reviewed and updated. In this respect, the proposed BBNJ Instrument might also benefit from the use of 'schedules', 'annexes' and 'protocols' that could comprise medium- and short-term environmental targets. This would allow them to be reviewed and updated periodically and more efficiently, e.g., by the proposed Scientific and Technical Body.

However, to be effective in guiding coherent multilateral action, a globally agreed biodiversity conservation vision and overarching goals need to be more than voluntary commitments and be enforceable. Therefore, an enforcement and compliance mechanism should be established under the proposed BBNJ Instrument to ensure that State Parties are meeting their conservation obligations as well as any other responsibilities (e.g., in relation to the conduct of environmental impact assessments). Such a mechanism would only apply to State Parties to the proposed BBNJ Instrument, and therefore States would be the ones responsible for ensuring coherent application, implementation, and compliance with measures across other instruments. The Conference of the Parties (COP), to be established under the proposed BBNJ Instrument, could however invite other agreements and organisations to report on the implementation of measures under their framework (BBNJ November 2019 Draft Text, art. 21.5). Proposals how this interface between the new instrument, the ISA and other sectoral management bodies could be strengthened are made further below.

4.2.1.3 Steps to Enhance Coherence in ABNJ

In order to support the implementation of the biodiversity conservation vision and goals of the proposed BBNJ Instrument, sectoral and regional management bodies, such as ISA, would have to:

- a) Adjust its own environmental goals, policy and measures in line with the overarching vision, strategic goals and objectives as formulated in the proposed BBNJ Instrument;
- b) Ensure coherence of instruments such as the ISA REMPs with the global and regional conservation framework;
- c) For this purpose, create new or actively engage with existing regional ocean governance frameworks with regional stakeholders;
- d) Regularly inform the proposed BBNJ Instrument Secretariat/COP and provide updates on the implementation and monitoring of current management and conservation measures, for example as part of REMPs, and on the development of future measures (BBNJ November 2019 Draft Text, art. 21.5).

Indeed, in light of the proposed BBNJ Instrument and an ecosystem approach to governance in ABNJ, the common heritage principle applying to the Area and its mineral resources (Art. 136 UNCLOS) might also need a re-balancing from the

present ambitions to enable mining towards preventing harmful effects of such activities (Christiansen et al., 2019; Mickelson, 2019). While the ISA today acts more like a mining agency (Proelß, 2013) and developer than a custodian (Kim, 2017), the original concept was '*focused on solidarity and trusteeship, for the management of some of the most remote natural resources on Earth*' and therefore included environmental protection from the start (Mickelson, 2019; Jaeckel, 2020a). Indeed, it is likely that the environmental and biodiversity cost of exploitation of the seafloor minerals by far outweighs any other benefit to mankind (Jaeckel et al., 2017; Kim, 2017; Folkersen et al., 2018; Christiansen et al., 2019; Levin et al., 2020a; Singh, 2020; Krutilla et al., 2021; Thiele et al., 2021a; Thiele et al., 2021b).

4.2.2 The Need for Collaborative Arrangements to Achieve Integrated Ocean Governance in ABNJ

Apart from the steering function of the proposed BBNJ Instrument to take effect on the actions of the individual ocean actors, all actors should be obliged by a duty to cooperate to increase the effectiveness of measures, such as spatial protection measures. From a conservation perspective, without universal recognition, unilateral sectoral measures in ABMTs, including MPAs, will in most cases not be sufficient to exclude harmful activities and might therefore not contribute to global biodiversity targets, such as the 30% spatial protection target under the CBD post-2020 Global Biodiversity Framework by 2030. This also holds for the APEIs designated by ISA, or for the OSPAR MPAs in ABNJ (see section 4.2.2). Complementary conservation and management measures are essential to take account of the ecological interconnectedness of the oceans (Dunn et al., 2019; Hays et al., 2019).

Vice versa, any ABMTs established by or designated under the proposed BBNJ Instrument would also require sectoral measures, including eventually through the ISA, to exclude harmful effects within its boundaries. It will be crucial to address the competing interests of mining, conservation and social values of certain deep seafloor habitats such as hydrothermal vent fields, seamounts. Without such a collaborative arrangement, conflicting questions may arise that could hardly be addressed. For example, will the ISA be able to continue contracting in designated EBSAs and affecting vulnerable marine ecosystems protected from deep-water fishing? Will the MPAs designated under the proposed BBNJ Instrument include the seafloor, the Area? How can already established MPAs like those of OSPAR on the Mid-Atlantic Ridge become effective for actors globally?

To ensure the coherence of measures across sectors, consultation and coordination processes could also be undertaken regionally, for instance through the REMP process, or through marine spatial planning (MSP)³⁸ exercises under the proposed BBNJ Instrument (Wright et al., 2019; Rayfuse, 2020).

³⁸Described by IOC-UNESCO as '*a practical way to create and establish a more rational use of marine space and the interactions among its uses, to balance demands for development with the need to protect the environment, and to deliver social and economic outcomes in an open and planned way*', <https://ioc.unesco.org/index.php/topics/marine-spatial-planning> (accessed: July 2021).

³⁷<https://sdgs.un.org/topics/oceans-and-seas>

MSP can complement strategic environmental assessment and planning and has emerged as one way to successfully engage a broad range of stakeholders (Olsen et al., 2014) to cooperate and find solutions towards the achievement of the environmental goals and objectives as agreed, and to address the need to enhance transparency and accountability (Ardrón et al., 2018; Ardrón, 2020; Komaki and Fluharty, 2020). To date, MSP has only been applied within national jurisdiction, but it is considered to be a mechanism which could also help to enhance coordination efforts in ABNJ (Ardrón et al., 2008; Altwater and Passarello, 2018; Gjerde and Wright, 2019; UNEP-WCMC, 2019).

4.2.2.1 Current Status in Draft Text

At present, however, the proposed BBNJ Instrument does not provide a detailed mechanism on how to improve cross-sectoral collaboration nor include concrete provisions for operationalising a central integration or oversight. Rather, it leaves it to State Parties to promote coherence and complementarity when establishing ABMTs and MPAs in ABNJ, including through the adoption of conservation measures to complement existing measures designated under other frameworks and bodies, and to make consultation and coordination arrangements to enhance cooperation between relevant frameworks and bodies (BBNJ November 2019 Draft Text, arts. 15.1 and 15.3). So far, MSP is not mentioned in the current draft text of the proposed BBNJ Instrument, nor are there explicit provisions other regional or strategic mechanisms.

4.2.2.2 Strengthening the BBNJ Instrument in Line With EAM

To become such a platform for integrated ABNJ governance, De Santo et al. (2019) suggest that the proposed BBNJ Instrument: a) needs to define its relationship with existing and future instruments, especially in case of inconsistencies; b) requires treaty bodies to cooperate and coordinate; and c) strengthens and operationalises UNCLOS Art. 195 regarding the no-transfer of hazards, damages or types of pollution, which calls for an integrated approach to environmental protection (Kim and van Asselt, 2016).

Options for practical arrangements to implement integrated biodiversity conservation in ABNJ are either through a mandatory cooperation requirement to all actors, through recommended collaborative arrangements among competent bodies, or as a minimum through voluntary commitments to collaborate towards a sustainable environmental governance agenda, such as through regional platforms mediating sectoral interests, regional spatial planning exercises complementing regional assessments, joint regional action plans or joint environmental monitoring programmes. Several constellations between central and polycentric governance arrangements are thinkable (Berry, 2021; Gjerde and Yadav, 2021). In any case, the sharing of competences and an unambiguous allocation of responsibilities to the different actors (Berry, 2021) as well as the will to mutual learning, building trust, adjustment and

coordination (Gjerde and Yadav, 2021) will be crucial to make progress to achieving the biodiversity goals.

4.2.2.3 Steps to Enhance Coherence in ABNJ

At this stage, it is difficult to predict how coordination between both regimes might take place in practice, in particular, as mechanisms have to be found which do not undermine the effectiveness of measures taken by other competent organisations (Clark, 2020). Nevertheless, a key step will be to create effective institutional arrangements for reporting, assessment, and oversight to ensure that measures adopted under the proposed BBNJ Agreement and other sectoral organisations, including the ISA, are coherent and complementary towards achieving the objectives of biodiversity conservation in ABNJ. Otherwise, there would be a high risk that protective measures that are deemed vital for biodiversity conservation could be undermined by impacts from sectoral activities.

For the sake of building mutual responsibility for the outcome, we suggest initial mechanisms which could enhance coherence between the proposed BBNJ Instrument and the ISA, as an example for a sectoral organisation:

- a) A contact group between the proposed BBNJ Instrument and the ISA, as proposed by Belgium (Kingdom of Belgium, 2018), could be established. This could, for instance, serve as an exchange platform to bring together stakeholders from both processes (and potentially others) to discuss area-based management approaches and possible measures. Such a contact group can eventually be established as a joint committee under the proposed BBNJ Instrument, where sectoral groups could come together to discuss and take collective action on matters relating to spatial planning and conservation measures;
- b) The establishment of a joint scientific advisory body, or at least a coordinating mechanism to link the future Scientific and Technical Body of the proposed BBNJ Instrument (BBNJ November 2019 Draft Text, art. 49) and the corresponding organ of the ISA, the LTC, should be considered. Indeed, a commission to provide advice on ocean science and funding could help address current knowledge gaps (Danovaro et al., 2017; Singh and Jaeckel, 2018) and stimulate greater conservation efforts;
- c) The proposed BBNJ Instrument could also be used as an avenue for collective action and joint oversight. The establishment of a joint compliance and reporting committee could be encouraged under the proposed BBNJ Instrument, thereby integrating the efforts of ISA to manage the effects of mining-related activities in the Area through REMPs into context with the broader environmental governance of the respective region;
- d) Joint scientific and monitoring programmes could also be established under the proposed BBNJ Instrument to facilitate the review of measures, or to identify vulnerable areas and threats from human activities;
- e) The Clearing House Mechanism to be established under the proposed BBNJ Instrument could also serve as a centralized

platform for cross-sectoral information and data exchange and repository with respect to the establishment, implementation, monitoring and enforcement of spatial protection and other measures in ABNJ (BBNJ November 2019 Draft Text, art. 51).³⁹ Furthermore, external science platforms, such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) or the Intergovernmental Oceanographic Commission (IOC) of UNESCO, could provide relevant scientific assessments and information.

While the future powers of the Conference of Parties (COP) under the proposed BBNJ Instrument are still debated, we suggest that the COP, supported by the Secretariat, should have the mandate to establish these and other mechanisms for effective coordination to achieve integrated ocean governance in ABNJ. The ongoing UN Ocean Decade (2021-2030) presents an opportunity to gather experience on such knowledge-driven and collaborative interplay between various processes and actors in ABNJ.

4.2.3 Integration Through Comprehensive Environmental Assessments

To address the problems around biodiversity conservation in ABNJ, the procedural mechanisms provided by Strategic Environmental Assessments (SEAs) are key to enable a more coherent, multi-sectoral governance and to better coordinate the connected Area-High Seas processes (Craik and Gu, 2019). SEAs and EIAs are closely linked, as SEAs generally provide guidance to project-specific EIAs. Such a SEA process, initialised through the proposed BBNJ Instrument, may act as an integrator of actors and interests, because it requires taking into view the whole of the ecosystem and its changes due to individual and cumulative effects of all human activities affecting a particular application area or region, from the seafloor to the surface rather than solely the effects on some of its components. As foreseen in various documents providing a framework on to operationalise strategic assessments,⁴⁰ this broad view and related adaptive decision-making on management is needed to prevent shifting baselines through informed decision-making, acknowledging uncertainties and knowledge gaps and risk-averse, inclusive decision-making.

4.2.3.1 Current Status in Draft Text

In its current draft, the text of the proposed BBNJ Instrument requires States Parties – either individually or in cooperation with other States Parties to this effect – to ensure that a SEA is carried out for plans and programmes associated with activities in ABNJ, which meet the same thresholds or criteria that will likely be established for triggering the application of EIAs in ABNJ (BBNJ November 2019 Draft Text, art. 28). Which exact activities would trigger such a process is still under negotiations, and there is currently no further elaboration on how this could be achieved nor who would concretely perform these SEAs and what its implications would be in terms of application and enforcement.

³⁹Also discussed in Berry, D.S., 2021. Unity or Fragmentation in the Deep Blue: Choices in Institutional Design for Marine Biological Diversity in Areas Beyond National Jurisdiction. *Frontiers in Marine Science* 8.

⁴⁰See e.g. United Nations (2003) and European Commission (2003).

Project-specific EIAs, on the other hand, remain single-sector tools, applied under the proposed BBNJ Instrument, and through competent authorities such as the ISA. It is as yet unclear which degree of alignment will be possible to achieve and what the relationship of sectoral EIAs will be with the proposed BBNJ Instrument. As an example, the relationship between the EIA process to be established under the proposed BBNJ Instrument and already established EIA processes under the ISA, is not yet determined. At present, several considerations exist, including the creation of a cross-sectoral coordination and consultation mechanism through the BBNJ Scientific and Technical Body (STB), the setting of global minimum standards for existing and future EIA processes in ABNJ, and the possibility of frameworks and bodies with existing EIA obligations already in place would need to conform to the EIA requirements to be established by the proposed BBNJ Instrument (BBNJ November 2019 Draft Text, art. 23).

4.2.3.2 Strengthening the BBNJ Instrument in Line With EAM

The operationalisation of SEAs therefore needs to be taken up more strongly in the proposed BBNJ Instrument and concrete objectives, minimum standards, and coordination mechanisms towards the application of SEAs in ABNJ need to be established. Furthermore, there should be a more prominent link in the proposed BBNJ Instrument between the SEA process and the establishment of ABMTs. At the moment, both of these elements are negotiated and drafted separately in the draft text of the proposed BBNJ Instrument. However, undertaking an SEA could, for instance, provide the scientific basis required to define where coherent networks of ABMTs should be established, it is therefore important to ensure a stronger link between these two elements in the future treaty.

Several tools complementary to SEAs are available to support enhanced transparency and outreach by existing organisations in ABNJ, like the ISA, and which would be needed also to operationalise it under the proposed BBNJ Instrument. These are e.g., a) stakeholder mapping; b) institutionalised information exchange, incl. data standardization; c) a clearing house mechanism for information collection and exchange; and d) initiate a collective arrangement with other existing bodies in the region. The OSPAR Collective Arrangement, for instance, is instructive for developing tools such as coherent assessment criteria and evaluation (NEAFC and OSPAR, 2015).

4.2.3.3 Steps to Enhance Coherence in ABNJ

Undertaking regular regional assessments in regions with REMPs could be a highly effective tool for ISA to contribute to EAM in ABNJ, if done in a strategic, cross-sectoral way. The regional focus taken by ISA offers the opportunity to use the REMP planning cycle as a platform for enhancing broad knowledge integration, adaptive management towards achieving environmental – i.e., conservation and restoration – goals,⁴¹ as well as conflict resolution at the regional scale. A

⁴¹The use of the terms goals-objectives-targets is inconsistent in agreements and other literature. We here use goals in the sense of overarching and/or strategic goals, supported by medium-term operational objectives and management targets in line with the SMART scheme (ICES, 2005).

systematic, ecosystem-based approach to regional planning, preferably by way of a strategic [environmental] assessment (SEA)⁴² (Warner, 2016; Craik and Gu, 2019; Jaeckel, 2020b), regional environmental assessment (REA)⁴³ (Jones et al., 2019) or another form of integrated management (Ban et al., 2013; Ban et al., 2014; Stephenson et al., 2019) would possibly help to remedy some of the current short-comings of the REMP planning and contracting, and open new avenues for integration with the global conservation agenda as agreed in the proposed BBNJ Instrument.

Tiered REMP assessments carried out by the ISA, *i.e.* a hierarchy where regional assessments determine REMP which set the conditions for local project EIAs (Jones et al., 2019) could therefore feed into a SEA under the proposed BBNJ instrument for a defined ocean region. Likewise, ISA REMP assessments should seek coordination with the respective regional conservation organisations and adjacent coastal States. Ideally, a strategic assessment would investigate the environmental, economic and social effects of the ISA policy globally, and of draft REMP regionally before the adoption of any mining plans. A strategic assessment, however, is currently not planned, and due to the practical challenges of interaction of one sectoral organisation with others, REMP measures truly considering cumulative human impacts may be unrealistic under the current set-up.

Such a tiered approach to environmental assessment has been outlined also for consideration in developing the scope and procedures for EIAs in the proposed BBNJ Instrument (Warner, 2016; WWF, 2016; Doelle and Sander, 2020). It could mean that under the proposed BBNJ Instrument planning regions would be determined for biodiversity conservation, facilitating SEA-type ecoregion-scale assessments of cumulative, cross-sectoral and transboundary activities and related impacts on the marine environment together and as a whole *vis à vis* binding and non-binding strategic and operational goals and objectives (Tunnicliffe et al., 2020).

5 CONCLUSION

While strong political will is needed to transform the current governance system in ABNJ, the parallel negotiations on the proposed BBNJ Instrument and the development of ISA Mining Code, including REMP provide the unique chance to approach comprehensive, integrated ocean governance through the implementation of an ecosystem approach to management. This provides the opportunity to: (1) better integrate discussions in the sectorally divided sphere of international

ocean governance; (2) improve the data collection and exchange and adopting a common understanding on management priorities; (3) work towards a fair and more equitable management of biodiversity and mineral resources in ABNJ; and (4) reduce time and cost, considering that activities in ABNJ are logistically demanding, technologically dependent and economically expensive.

However, despite decades of calls for greater integration in ocean, climate and biodiversity policies, there appears to be an inertia in ABNJ governance and preference among many parties to maintain the sectoral *status quo*, as reflected in the current draft text of the proposed BBNJ Instrument and the ISA REMP development process. To ensure real progress in combating the linked global biodiversity and climate crisis, the proposed BBNJ Instrument should serve as a 'stronghold' for EAM, using the parallel negotiations in both processes as a window of opportunity to arrive at a common understanding as to what the EAM, and in particular precautionary management means in practice and how key principles (e.g., longterm maintenance of ecological integrity, transparent and inclusive planning, a knowledge-based management cycle) are operationalized in ABNJ. This would require synergistic institutional interplay and a common agreement of how regional and sectoral organisations (e.g., by taking necessary measures, such as REMP adopted by the ISA) could best support BBNJ governance and *vice versa*. This requires improvements to be made. The REMP planning cycle should *inter alia* be informed by an intensive exchange with all relevant users and regulators in the regions, including through building up a common knowledge base, clearing house mechanism, common research and monitoring programmes. The REMP adopted by the ISA would have to be open to review to align with the final BBNJ Instrument.

Moreover, the proposed BBNJ Instrument should be instrumental to unifying biodiversity protection standards and enabling a multifaceted governance landscape to cooperate towards retaining the health of ocean ecosystems for the benefit of all by providing an overarching conservation vision and strategic goals for ABNJ.

Box 1 summarises initial recommendations put forward by the authors in this paper on how to enhance the coherence of biodiversity conservation in ABNJ, using REMP as a case study to further global biodiversity conservation goals and the proposed BBNJ Instrument as an opportunity to promote cross-sectoral collaboration in ABNJ premised on EAM. Though this paper focused on the coherence between REMP and the proposed BBNJ Instrument through EAM, suggestions made in this paper could be applied to other sectors and more broadly for strengthening integrated ABNJ governance in general.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**. Further inquiries can be directed to the corresponding author.

⁴²Strategic Environmental Assessments (usually including social and economic assessment strands) are transboundary assessment procedures, including high resolution risk assessments and eventually spatial planning to scrutinise the environmental effects of existing and upcoming policies, plans of programmes with regards to their comprehensive effects compared to pre-agreed overarching visions and objectives for the respective regions.

⁴³Regional Environmental Assessments are broad-scale tools delivering the essential regional baseline environmental and human activity information.

BOX 1 | Summary of recommendations.**Recommendations for making ISA environmental governance and Regional Environmental Management Plans more coherent with integrated, ecosystem-based governance in ABNJ and alignment with the proposed BBNJ Instrument**

- Establish an Environmental or Scientific Commission, or at least greatly enhance the environmental expertise to inform decision-making at the ISA.
- Establish a contact group between the ISA and the proposed BBNJ Instrument, as proposed by Belgium.
- Align the global and regional environmental conservation efforts subject to Article 145 of UNCLOS (effective protection from mining-related harm) with those of the proposed BBNJ Instrument or adopt ones that are more ambitious.
- As a minimum, respect existing and planned designations of marine protected areas and other precautionary spatial conservation designations, such as EBSA and VME designations, through other organisations, including the proposed BBNJ Instrument, in all or parts of the Area and overlaying High Seas when developing regional management plans, REMPs, and when adopting or reviewing the Plans of Work of applicants for exploration and exploitation licenses.
- Join the Collective Arrangement initiated by OSPAR and NEAFC.
- Apply and operationalise the criteria for identifying vulnerable and particularly sensitive species, habitats, and seascapes, as implemented by regional fisheries management organisations (to identify VMEs), the International Maritime Organisation (to identify PSSAs), regional environmental conventions and States, in relation to risks from mining-related activities.
- Establish the procedures to enable systematic and transparent communication processes with management authorities and stakeholders in the respective regions and contract areas. This will enhance transparency, support a holistic view on risks to and trends in the environment, and prevent overlooking existing interests, as has already happened with underwater cables crossing through later designated exploration areas.
- Enable the uniform application of environmental standards by developing and implementing the REMPs in all ocean basins in a standardised way, including through shared principles, ambitious conservation goals, comprehensive assessment, e.g. SEA, decision-making procedures and measures enhancing the precautionary spirit of the ecosystem approach including through acting as a cross-sectoral collaboration platform.
- Use REMPs as a case study for the regional implementation of an ecosystem approach for integrated and adaptive management and cross-sectoral collaboration to achieve an inclusive and future proof governance regime in ABNJ.
- Consider an explicit environmental strategy imbedded into the follow-up ISA Strategic Plan after 2023 as the best means to integrate the ISA efforts to protect marine biodiversity from the effects of mining with the vision and objectives of the overarching proposed BBNJ Instrument.
- Contracting should be linked to the respective REMPs: Regionally, until mining impacts can be fully predicted, a staged or staggered approach (spatial and temporal) of mining activities is needed, as well as making the approval of exploitation applications, or later on the permission to proceed with commercial production, contingent upon contractors being able to demonstrate a) its ability to manage environmental harm via test mining projects, and b) that the environmental cost, while below the 'serious harm' threshold to be determined, does not exceed the benefit to mankind from mining. REMPs should be constantly updated as knowledge increases.
- A strong vision and strategic goals for biodiversity conservation in ABNJ might encourage a re-envisioning of the common heritage of mankind, in particular in view of the environmental and social costs of deep seabed mining.

Recommendations for strengthening the ecosystem approach to management and coherence of measures in the proposed BBNJ Instrument

- Spell out a long-term vision, accompanied by strategic goals, which highlight the intrinsic links that exist between biodiversity, climate, and healthy and productive oceans, including their ecological recovery to meet the needs of present and future generations, both in the Preamble and the objective (strategic goals) of the proposed BBNJ Instrument. The vision should be at least as ambitious as the vision and goals of the CBD post-2020 Global Biodiversity Framework.
- Add to the Preamble the '*common concern to humankind*' in the same way as the CBD Preamble, namely '*Affirming that the conservation of biological diversity is a common concern of humankind*'.
- Articulate how key principles (e.g. the precautionary approach, ecosystem approach, and best environmental practices) and procedures (e.g. SEA) are operationalized in ABNJ. An ABNJ Biodiversity Strategy will support this.
- Incorporate secondary means into the proposed BBNJ Instrument (such as 'schedules', 'annexes' or 'protocols') that would allow the introduction of specific operational and technical measures (e.g. specific short-term environmental targets) that can be reviewed and updated periodically and more efficiently.
- Make the proposed BBNJ Instrument a 'stronghold' for EAM, possibly using this as a window of opportunity to arrive at a common understanding as to what EAM means and how it applies in the context of ABNJ, while leaving it to sectoral organisations to implement (e.g. by taking necessary measures, such as REMPs adopted by the ISA).
- Use the proposed BBNJ Instrument as an avenue for collective action and joint oversight:
 - a. Establish a joint scientific advisory body, or at least a coordinating mechanism to link the Scientific and Technical Body of the proposed BBNJ Instrument and the corresponding sectoral science advisory organs such as the ISA Legal and Technical Commission. Such a joint scientific advisory body could for example also complement the development of sectoral REMPs by way of all-inclusive regional SEAs.
 - b. Establish concrete objectives, minimum standards, and cooperation mechanisms towards the application of SEAs in ABNJ, as well as a more prominent link between the SEA process and the establishment of ABMTs.
 - c. Establish coordinated, coherent, large-scale marine monitoring programmes covering all waters, including the deep-sea and finance research on the environmental baselines of particular areas, including the determination of appropriate and measurable indicators and metrics which can be used to check the direction of change of environmental health.
 - d. An enforcement and compliance mechanism could be established under the proposed BBNJ Instrument. This could include a joint reporting committee under the proposed BBNJ Instrument to which all actors would have to report progress made towards achieving the strategic and operational goals. The committee would integrate knowledge, promote coherence, and recommend action needed.
- The proposed BBNJ Instrument and the ISA's regulatory regime would benefit from clear provisions that define their relationships with existing as well as future instruments and requires cooperation with other competent organisations and their bodies.

AUTHOR CONTRIBUTIONS

SC initiated the concept and managed the writing process. This was a truly cooperative endeavour. All authors discussed, elaborated, reviewed and contributed to the final text. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

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