

**Strengthening high seas
governance through
enhanced environmental
assessment processes**

A case study of mesopelagic fisheries
and options for a future BBNJ treaty

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Abbreviations

ABMT	Area-based Management Tool
ABNJ	Areas Beyond National Jurisdiction
APEI	Area of Particular Environmental Interest
BBNJ	Biodiversity Beyond National Jurisdiction
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
CBD	Convention on Biological Diversity
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CMM	Conservation and Management Measure
CMS	Convention on the Conservation of Migratory Species of Wild Animals
COP	Conference of Parties
CPPS	Comisión Permanente del Pacífico Sur/Permanent Commission for the South Pacific
DSM	Deep Sea Mining
EBSA	Ecologically or Biologically Significant Marine Area
EEZ	Exclusive Economic Zone
EA	Environmental Impact Assessment
EIA	Ecosystem Risk Assessment
EU	European Union
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
IATTC	Inter-American Tropical Tuna Commission
IBA	Important Bird and Biodiversity Area
ICCAT	International Commission for the Conservation of Atlantic Tunas
IGC	Intergovernmental Conference
IKI	International Climate Initiative
IMO	International Maritime Organization
IOC-UNESCO	Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization
IPOA	International Plan of Action
ISA	International Seabed Authority
IUU	Illegal, Unreported and Unregulated (Fishing)
IUCN	International Union for Conservation of Nature
LME	Large Marine Ecosystem
MGR	Marine Genetic Resource
MPA	Marine Protected Areas
NCP	Non-Contracting Party
NOAA	National Oceanic and Atmospheric Administration
OBIS	Ocean Biogeographic Information System
PSSA	Particularly Sensitive Sea Area
REA	Regional Environmental Assessment
REMP	Regional Environmental Management Plan
RFMO	Regional Fisheries Management Organisation
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SDG	Sustainable Development Goal

SEA	Strategic Environmental Assessment
SEAFO	South East Atlantic Fisheries Organization
SPRFMO	South Pacific Regional Fisheries Management Organisation
UCN	Universidad Católica del Norte
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
VME	Vulnerable Marine Ecosystem
WCPA	World Commission on Protected Areas
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation
WWF	World Wide Fund for Nature (US, Canada: World Wildlife Fund)

Executive summary

The ongoing negotiations for a new international legally binding instrument on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (BBNJ Agreement) provide a unique opportunity to safeguard ocean health by improving coherence, developing capacity, and complementing and supporting existing bodies.¹

This report explores the challenges of addressing emerging activities in areas beyond national jurisdiction (ABNJ) through a case study – a hypothetical proposal to develop commercial fisheries in the mesopelagic zone. The case study considers how such a proposal might be addressed by existing global and regional bodies and processes and the potential future role of the BBNJ Agreement.

The case study highlights the importance of not excluding any type of activity or sector from the BBNJ Agreement and of ensuring that uniform standards are developed to guide implemen-

tation. This will help build resilience to climate change, ensure consideration of all potential and cumulative impacts, and inject precaution into management and decision-making processes. It further underscores the importance of broad stakeholder consultation and the integration of diverse sources of knowledge and values. This report shows how integrated environmental assessment processes can contribute to achieving globally agreed goals, by improving understanding of the regional context and lifting institutional capacities. By providing for a multilevel approach that combines effective project-level impact assessment with broader regional and strategic environmental assessments, the BBNJ Agreement can generate multiple benefits: new scientific knowledge that can inform ecosystem-based management (EBM); wider participation, consultation and cross-sectoral cooperation; and a common understanding of priorities for action within and across regions and sectors.

¹The term “ocean health” is here used to mean “resilient, productive and diverse”, as these are the “essential requirements for a good status and serve as focal points for an integrated assessment of marine systems...” (Franke et al., 2020).

Key messages

- 1) The waters below the ocean's sunlit surface layers, known as the mesopelagic zone, are filled with a fascinating array of life. While mesopelagic fish are of increasing commercial interest due to their potentially huge biomass, scientists are also discovering that they play a vital role in the global carbon cycle and food webs and may be especially vulnerable to impacts from fishing and climate change.
- 2) An integrated approach to environmental assessments is needed to address transboundary and global conservation concerns and to contribute to the development of regional cooperation, coordination and capacities.²
- 3) The BBNJ Agreement can provide a platform for regional and cross-sectoral cooperation, coordination and coherence by establishing strong standards and procedural obligations for environmental assessments to complement any existing sectoral or regional requirements. To do this, the BBNJ Agreement also needs to include common obligations to implement global standards, shared objectives and principles, as well as global processes for monitoring and reporting.
- 4) Not all established management bodies (e.g. those that regulate fisheries, shipping and deep seabed mining) currently have the capacity or mandate to manage all aspects of environmental assessment processes, such as public notification, stakeholder consultation, independent review, and consideration of alternatives. The BBNJ Agreement could set global standards for environmental assessments of all activities and sectors in conjunction with capacity-building tools to stimulate cooperative assessments involving relevant governance and management bodies, academic institutions and stakeholders.
- 5) Benefits of enhanced cooperation in the conduct of environmental assessments include improved access to information, better alignment of conservation objectives, more inclusive and participatory decision-making, and improved integration of biodiversity considerations and cumulative impacts into decision-making.
- 6) Regional environmental assessments (REAs) together with strategic environmental assessments (SEAs) can provide the essential baseline information and context for future environmental impact assessments (EIAs), as well as underpin the development and application of strategies, action plans, and area-based management tools (ABMTs) that can contribute to ecosystem-based management.³
- 7) To achieve the objective of enhancing sustainable use, environmental assessment provisions should reflect the need to avoid significant adverse impacts,⁴ build resilience, ensure application of a precautionary principle, use the best available knowledge (including science and traditional knowledge) and contribute to human well-being. The BBNJ Agreement could reflect emerging best practice by requiring that projects not only avoid impacts, but also make a net contribution to sustainability.

² As described in (Lieberknecht, 2020) "integration" includes "horizontal integration across sectoral governance structures, vertical integration across multiple tiers of administration, as well as integration of stakeholders, multi- and transdisciplinary integration (bringing together multiple spheres of knowledge), and integration across geographical scales and jurisdictional boundaries."

³ Such as marine protected areas (MPAs), spatially and temporally dynamic ABMTs, and marine spatial planning (MSP).

⁴ As called for in Sustainable Development Goal (SDG) 14.2, which provides: "By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans" <https://sdgs.un.org/goals/goal14>.

- 8) Few States currently have access to the knowledge and expertise needed to oversee effective environmental assessments, while project proponents may not be required to share data, assess potential effects outside their proposed project site, or consider alternatives. A fully integrated multi-disciplinary perspective will therefore require increased capacity for scientific research and associated technology. This can be achieved through international cooperation, as well as by open-access publishing and sharing data and information.⁵
- 9) Tools and support for long-term systematic research and monitoring will be needed to address global, regional, and local impacts on and changes to marine ecosystems and species under a changing climate. Monitoring based on harmonized indicators for ocean health, precautionary thresholds and triggers can enable managers to act rapidly to pre-empt and avoid significant adverse changes.
- 10) The BBNJ Agreement can enhance coherence through its substantive standards and procedural obligations. The current draft *procedural* obligations would provide important opportunities for meaningful consultation and public participation, a key part of accepted good practice, but otherwise the draft *substantive* standards are at present insufficient to secure either conservation or sustainable use. Further, they could result in inconsistent processes and results between, and even within, sectors and regions.

⁵Initiatives, such as the UN Decade on Ocean Science for Sustainable Development (2021–2030) can play an important role.

1. Introduction

This report considers how environmental assessment (EA) processes could be strengthened through a new international legally binding instrument on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (BBNJ Agreement). The report explores this issue through a case study, analysing how a hypothetical proposal to develop a new fishery in the mesopelagic zone would be treated under the current international governance framework. The case study demonstrates that a comprehensive EA process can improve knowledge and inform integrated ecosystem-based management (EBM),⁶ while also enhancing coordination, cooperation, coherence and capacities within and across regions and sectors.

The historical context is reviewed below, including the threats to ocean health and the challenges facing ocean governance frameworks. Section 2 provides an overview of the mesopelagic zone, highlighting the limitations of the current scientific knowledge and stressing the importance of mesopelagic species and ecosystems to the global carbon cycle. Section 3 introduces three types of environmental assessments – environmental impact assessment (EIA), strategic environmental assessment (SEA) and regional environmental assessment (REA) – highlighting current trends and emerging best practices.

Section 4 describes the existing international legal framework for EA in ABNJ and considers how these provisions may apply to a proposed mesopelagic fishery. Section 5 then analyses

the provisions in the current draft of the BBNJ Agreement,⁷ comparing them with the existing assessment processes under the auspices of two regional fisheries management organisations (RFMOs) and best practice standards. Section 6 considers how SEAs and REAs can help to: i) overcome the challenges of operating in the remote ocean where often there is insufficient or inadequate information upon which to make an informed decision; ii) stimulate regional coordination, cooperation, and capacities for coherent EBM outcomes; and iii) highlight potential triggers, tools and coordination mechanisms. In closing, Section 7 provides some reflections on how EA processes could be improved through a new BBNJ Agreement.

1.1 Context

At the UN Conference on Sustainable Development in Rio de Janeiro, Brazil in 2012 (Rio+20), world leaders made bold commitments to “protect and restore ocean health, productivity and resilience”, “maintain coastal and marine biodiversity”, and “effectively apply an ecosystem approach and the precautionary approach to activities having an impact on the marine environment”.⁸ The international community subsequently launched the process to define the Sustainable Development Goals (SDGs) and the 2030 Agenda.

Rio+20 also catalysed preparations towards a new international legally binding instrument for marine biodiversity in areas beyond national ju-

⁶ Ecosystem-based managed (EBM) is defined here as the “comprehensive, integrated management of human activities based on best available [scientific and traditional] knowledge about the ecosystem and its dynamics, in order to identify and take action on influences that are critical to the health of ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity” (Owen et al., 2016). EBM needs to become increasingly adaptive to respond to changes in the vertical and horizontal distribution of biodiversity on a seasonal basis, and increasingly, due to climate change (Mendenhall et al., 2020; Ortuño Crespo et al., 2020).

⁷ A/CONF.232/2020/3, 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 (27 November 2019) <https://undocs.org/en/a/conf.232/2020/3>.

⁸ The Future We Want (2012) UNGA Resolution A/66/288, §158.

isdiction (ABNJ),⁹ which had long been the subject of extensive informal discussions (Wright et al., 2018). Formal negotiations commenced in 2018 with the aim of ensuring the conservation and sustainable use of marine biodiversity in ABNJ by enhancing international cooperation and coordination.

The negotiations focus on four issues in particular:

- marine genetic resources, including questions on the sharing of benefits,
- measures such as area-based management tools, including marine protected areas,
- environmental impact assessments and
- capacity building and the transfer of marine technology.¹⁰

In November 2019, the President of the Intergovernmental Conference (IGC) released the revised draft text of the BBNJ Agreement.¹¹ The draft elaborates foundational principles, approaches and procedures and outlines an institutional framework. The draft reflects broad support for well-established principles and approaches, such as the precautionary principle, ecosystem-based management, and the use of best available science and knowledge. It also embraces an “approach that builds ecosystem resilience and restores ecosystem integrity”, thereby providing a means for integrating climate change into decision-making and imple-

mentation. There are nonetheless many key areas where States are yet to reach consensus.

1.2 Challenges to enhancing coordination, cooperation, capacity and coherence

The current ocean governance regime is inadequate to ensure the sustainability of marine resources or to protect the health of marine species and ecosystems in ABNJ (Houghton and Rochette, 2014; Tladi, 2011; Wright et al., 2018). Existing frameworks are increasingly challenged by the effects of rapidly accelerating climate change, including heat waves, deoxygenation, ocean acidification and shifts in currents and the distribution of biodiversity, as well as declining primary productivity (IPCC, 2019; Pentz et al., 2018). The prospect of deep seabed mining in ABNJ is raising further concerns that this new activity may further undermine ocean health (Drazen et al., 2020; Levin et al., 2020). At the same time, responses to these new pressures must be understood and implemented in the context of cumulative effects of pollution, including chemical, plastics and noise, as well as unsustainable fishing that is causing fundamental shifts in the structure of entire ecosystems and reducing resilience (Crespo and Dunn, 2017; L. Lieberknecht, 2020). These effects are creating further demands for proactive measures to build ecosystem resilience and restore integrity (Frazão Santos et al., 2020) that existing organizations may be ill-equipped to provide.¹²

⁹ “Marine areas beyond the limits of national jurisdiction” include the open ocean water column and seabed beyond the boundaries of nation states. Legally these areas are called the “high seas” and the “Area”. Physically, ABNJ spans nearly half of the Earth’s surface and represents over 90 % by volume of habitat for life on Earth.

¹⁰ UNGA resolution 72/249. International legally binding instrument 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. <https://undocs.org/en/a/res/72/249>.

¹¹ A/CONF.232/2020/3, note 7. A compilation of views on the revised draft text submitted by many delegations and observers is also available: Textual proposals submitted by delegations by 20 February 2020, for consideration at the fourth session of the Intergovernmental conference on an international legally binding instrument 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 (the Conference), in response to the invitation by the President of the Conference in her Note of 18 November 2019 (A/CONF.232/2020/3) https://www.un.org/bbnj/sites/www.un.org.bbnj/files/textual_proposals_compilation_article-by-article_-_15_april_2020.pdf

¹² Yadav and Gjerde (2020) spell out seven principles for ecological and institutional resilience in ABNJ under a changing climate.

While a few ocean regions have mechanisms for advancing coordination and cooperation,¹³ there are considerable barriers to integrated governance of ABNJ. In particular, the current framework features a complex array of organizations that focus on increasing economic benefits from activities such as shipping, fishing, seabed mining, or supporting regional economic cooperation, while very few organizations focus on advancing ocean health or biodiversity conservation (Wright et al., 2018). Although some sectoral organizations have the legal mandate to adopt conservation measures relevant to their specific activity, most organizations are limited by narrow mandates, inadequate access to the best available science, and significant capacity or financial challenges (Ardron et al., 2014; Gjerde

and Wright, 2019; Mahon et al., 2015; Wright and Rochette, 2018). As a result of these constraints, the levels of cooperation and policy coherence vary significantly across regions (Hilborn et al., 2020; Mahon and Fanning, 2019).

The negotiations for a new BBNJ Agreement therefore provide a unique opportunity to improve cooperation and coordination amongst and between global, regional and sectoral organizations. As described in this report, this can be achieved in a manner that complements existing mandates and strengthens capacity, while also advancing coherent conservation outcomes for the benefit of present and future generations.

Box 1: BBNJ Agreement must “not undermine” existing frameworks

Area-based Management Tools, Including Marine Protected Areas

A key issue facing negotiators is how to define the relationship of the BBNJ Agreement with other relevant legal instruments and frameworks and relevant global, regional, sub-regional bodies. While States agreed that the new BBNJ Agreement will “not undermine” existing agreements or bodies, divergent interpretations of this phrase have sought to both constrain and increase ambition (Friedman, 2019; Scanlon, 2018; Wright et al., 2016). How this phrase is ultimately reflected in the BBNJ Agreement will have important implications for the instrument’s ability to enhance coordination and cooperation, build capacity and achieve coherent management outcomes.

¹³ E.g. the South West Pacific (Quirk and Harden-Davies, 2017) and South East Pacific (Durussel et al., 2017)

2. Case study: mesopelagic fisheries

Mesopelagic fisheries have unique characteristics that make them an interesting case study for exploring how the international community assesses environmental impacts of proposed activities and ensures effective management of critical ecosystem services. In particular, they are:

- A proposed activity that may come under the auspices of both **existing fisheries regulations and the future BBNJ Agreement**;
- Subject to **growing interest in commercial exploitation**, driven by “Blue Growth” policies and the perceived imperative of “unleashing new marine resources for a growing human population” (Norwegian Institute of Marine Research, 2017). Though some mesopelagic fishing has taken place in the past, recent interest focuses on the potential for use in aquaculture and high-value nutraceuticals, such as Omega-3 oils (St. John, 2016);
- **Especially vulnerable** to anthropogenic pressure, including from fishing and climate change (St. John et al., 2016);
- Critical for maintaining the **biological pump, which sequesters carbon and regulates the climate** (St. John et al., 2016; Jin et al., 2020; Martin et al., 2020);
- A **key link in oceanic food webs** (Choy et al., 2017), supporting biodiversity and providing prey for commercially valuable species such as tuna;
- Important **producers of carbonate** (through excretion), an ecosystem service that will likely gain importance as the ocean warms and becomes more acidic (Wilson et al., 2009).
- **Poorly understood**, with the scientific community underscoring that there is a “dark hole in our understanding” (St. John et al., 2016) and that the mesopelagic zone “must be studied now, before it is too late” (Martin et al., 2020).

With this in mind, the case study parameters have been defined so as to best highlight the complexities and the various issues at stake in this example.

Table 1: Rationale for case study parameters

Parameter	Significance
A State proposes to begin exploiting mesopelagic lanternfish (<i>Myctophid</i>) fish stocks.	Lanternfishes are vital as a keystone species in marine food webs and carbon cycling, so there are potentially global ramifications that go beyond simple regional stock management issues.
The fishery is just beyond the 200-mile exclusive economic zones (EEZ) of several developing coastal States (i.e., in ABNJ), but based on biogeographic studies, mesopelagic fish stocks and their associated ecosystems may straddle EEZ and high seas.	Fishing adjacent to an EEZ may have impacts on coastal States' fisheries and conservation interests, underscoring the importance of scientific understanding and inclusive governance processes.
Exploratory fishing is first proposed before a commercial fishery is developed.	International law requires a precautionary approach to the development of new high seas fisheries and a State would likely propose an exploratory fishery within the relevant RFMO. ¹⁴ RFMO capacity and performance varies and impact assessment processes may not be equipped to adequately assess mesopelagic fisheries.

¹⁴ RFMOs are the preferred vehicle for management cooperation and generally have requirements for approval of an exploratory fishery (See Sections 4.3 and 4.10.5).

Parameter	Significance
Up to 500 tonnes per vessel per day of mesopelagic lanternfish could be harvested.	An initially small exploratory fishery, approved with minimal environmental assessment, could quickly expand, increasing the potential for significant adverse impacts.
The catch is not destined for direct human consumption , but will be processed into commercially valuable products, such as feedstock for aquaculture, nutritional supplements, or cosmetics.	Exploitation of critical common resources for commercial profit may raise equity and sustainability concerns, especially in the absence of effective participatory governance mechanisms.
The fishery is proposed to take place in the high seas of the Southeast Atlantic or the Southeast Pacific .	Focussing on certain regions allows for detailed consideration of existing processes under fisheries management bodies. These two regions are the focus of the STRONG High Seas project, but provide generalisable insights.

2.1 Overview of mesopelagic ecosystems

The mesopelagic zone, or “ocean twilight zone” lies below the ocean’s sunlit upper layers and above the bathypelagic or “midnight zone.” From the upper limit of the mesopelagic zone at about 150–200 m depth to its lower limit at about 1000 m, sunlight goes from 1% of surface levels to 0% and the meso/bathypelagic transition. Together the oceanic midwaters (mesopelagic + bathypelagic) constitute the largest living space on Earth.

The mesopelagic zone is populated by a diverse fauna, including gelatinous creatures such as ctenophores, siphonophores, and hydromedusae (Robison, 2009), other zooplankton, and vertically migrating fishes, shrimps and squids. Some gelatinous zooplankton are carnivores, but other gelatinous creatures are filter feeders; some spin vast webs of mucous to capture floating food particles. These gelatinous creatures have been extremely difficult to study until recent advances in photography, as they are quickly reduced to slime at the bottom of a net (Hamner et al., 1975)

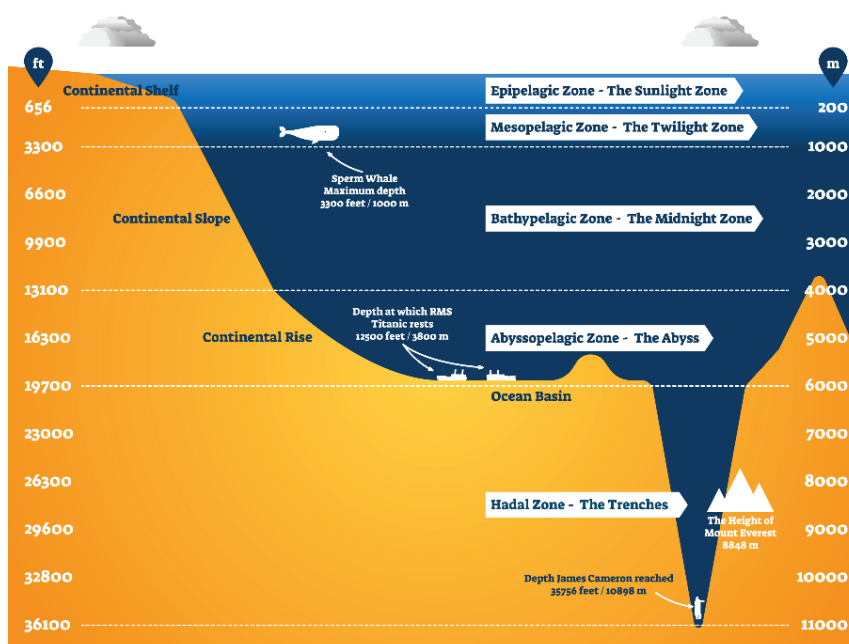


Figure 1: Ocean layers | © VectorMine/Shutterstock.com

The daily vertical migration of many fishes, squid, zooplankton and other organisms from midwater depths to the surface waters is the largest animal migration on Earth (Hoagland, 2020). These species are a vital component of food webs (Choy et al., 2017; Drazen and Sutton, 2017) as they are prey to a wide range of pelagic predators, including commercially important tuna and billfish, sharks, sperm whales, swordfish and even deep-diving seabirds (Hoagland, 2020; Hudson et al., 2014). These species are similarly important prey to deep sea bottom dwelling species where the bottom intersects their habitat such as at seamounts (e.g. orange roughy food) and continental/island flanks (within EEZs in these cases though). And while there are not tagging and tracking studies for species as small as myctophids, their populations are very likely to straddle national and international boundaries. (Hoagland, 2020; Sutton et al., 2017).

Mesopelagic species are also a critical component of the biological carbon pump (Martin et al., 2020), consuming zooplankton near the surface and transferring it to the deep ocean, where it is released (excretion) and sequestered for long periods of time. While the net amount of carbon sequestered in this way is highly uncertain, estimates range between 2 and 6 billion metric tons from the twilight zone annually—with the lower estimate equivalent to twice the amount of carbon dioxide emitted by automobiles worldwide (Hoagland, 2020).

Finally, mesopelagic fishes are likely key players in the biogeochemistry of the world's oceans. Marine fishes produce precipitated carbonates in their intestines, which are excreted at high rates. It is estimated that marine fishes contribute between 3–15% of the total oceanic carbonate production (Wilson et al., 2009), with mesopelagic fishes likely being a large portion of this owing to their high global biomass.

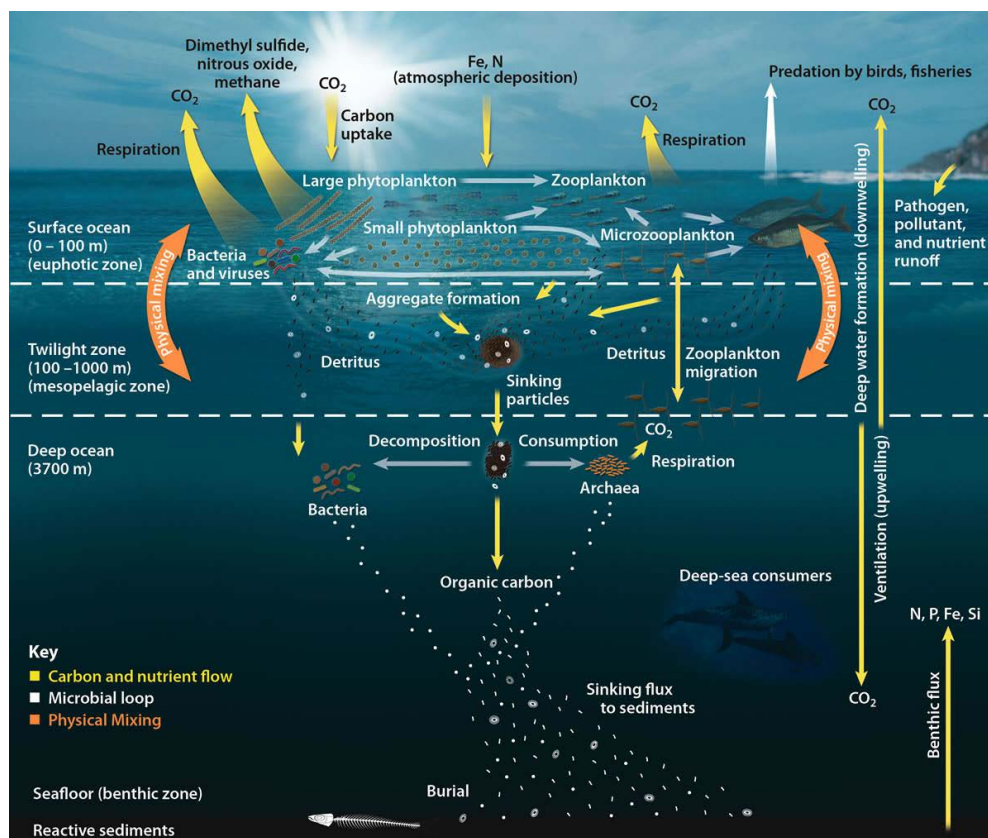


Figure 2: Marine food web and carbon flows | © U.S. Department of Energy

2.2 Fishery potential

The mesopelagic zone may host huge standing stocks of mesopelagic fishes globally, with an estimated biomass of up to 10 billion metric tons (Irigoien et al., 2014).¹⁵ The possibility that lanternfishes could support commercial fisheries has been known since the 1960s (Shotton, 1997), though few concerted attempts have been made to develop the stocks.

Interest in developing a commercial fishery is now gaining momentum. Unlike most fisheries that harvest primarily for direct consumption, mesopelagic fisheries are targeted for fishmeal for the aquaculture and animal feed industries, and as potential source material for the derivation of pharmaceuticals and nutraceuticals (Alvheim et al., 2020; Hidalgo and Browman, 2019; Remesan et al., 2019; Sutton et al., 2020).¹⁶

Standal and Grimaldo (2020) report that “large-scale industrial actors outside the traditional fisheries domain are paying attention to the potential new fishery”, especially big companies that “have the knowledge and needed resources (human capital and financial strength) to operate and further develop huge factory trawlers with full-fledged on-board processing plants”.

Mesopelagic fisheries could entail bycatch (e.g. crustaceans, squid and other fishes) and will likely represent a mixed fishery of variable biodiversity, depending on depths fished and the region (Sutton et al., 2017). The high connectivity and very broad spatial scales associated with many mesopelagic assemblages could make

management stock assessments very difficult to conduct accurately (i.e., if a fishery occurs in one area, but the impacts may be spatially and temporally distant due to ocean currents and broad-scale passive dispersal (Milligan and Sutton, 2020)

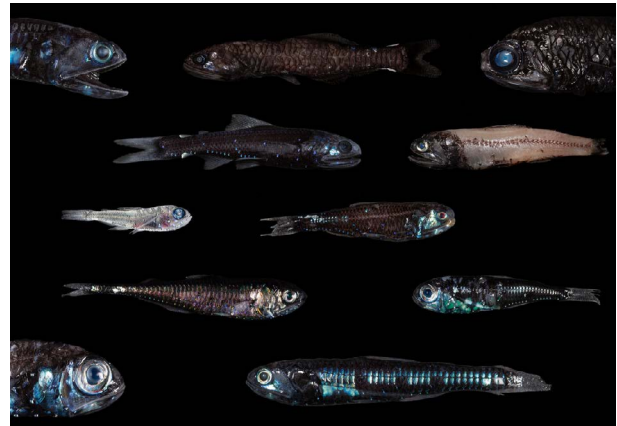


Figure 3: Lanternfish | © Paul Caiger, Woods Hole Oceanographic Institution

As mismanagement of mesopelagic species and ecosystems could have global ramifications (St. John et al., 2016), improved scientific understanding and a precautionary approach are critical. Sustainable exploitation of these resources, “requires a holistic assessment of the community and an understanding of the mechanisms controlling this biomass, its role in the preservation of biodiversity and its influence on climate as well as management tools able to weigh the costs and benefits of exploitation of this community” (St. John et al., 2016).

¹⁵ This is 10 times larger than previous estimates, although the real biomass is still in question (Hoagland, 2020) and estimates vary widely.

¹⁶ At the same time, there are a range of alternatives under development that do not require exploitation of fish, such as growing seaweed and algae for use in fish feed and Omega-3 supplements. See, e.g. the MACROSEA project (<https://www.sintef.no/projectweb/macrosea/>) and the AquaVitae Consortium (<https://www.aquavitaeproject.eu/>).

3. Environmental assessments

Environmental assessments are a core tool for ensuring precaution in the development of new human activities. The assessment process can reveal the range of potential effects of an activity on multiple components of an ecosystem (including direct, indirect and cumulative effects) and possible ways to mitigate predicted impacts (Cashmore, 2004; Morgan, 2012; Petts, 1999; Wright and Kyhn, 2015). They are also an important procedural tool for ensuring full stakeholder consultation and consideration of multiple views and values (Doelle and Sander, 2020; Hughes, 1998).¹⁷ Decision-makers can use this assessment to make informed decisions as to whether a new activity or project should be allowed to proceed and under what conditions (Doelle and Sander, 2020).

While EIAs have been the focus of the BBNJ negotiations, they are only one type of environmental assessment, and the impact assessment community has long underscored the need for broader strategic and regional assessments that can better inform ecosystem-based management (Doelle and Sander, 2020; Jay et al., 2007a; Sadler and Verheem, 1996). Nevertheless, key provisions regarding the scope and procedures for broader strategic assessments remain bracketed in the revised draft BBNJ Agreement.¹⁸ It is suggested here that SEAs and REAs are essential to quality decision-making and management and would strengthen coordination, scientific and management capacities together with securing ocean health.

Table 2: Overview of different types of environmental assessment

	EIA	SEA/REA
Scale	➤ Project	➤ Policy, program or plan/region
Focus	➤ Determining whether a proposed project or activity is allowed to proceed, and under what conditions	➤ Understanding the potential impacts of longer-term policies, plans and programmes
Process	➤ Linear process with clearly defined stages, from proposal to decision and review	➤ Multi-stage, iterative process with feedback loops
Scope	➤ Emphasis on mitigating environmental impacts of a specific project ➤ Considers limited range of project alternatives ➤ Limited review of cumulative impacts	➤ Emphasis on meeting environmental, social and economic objectives and steering development and implementation of policies, programmes and plans ➤ Considers a broad range of alternative scenarios ➤ Incorporates consideration of cumulative impacts
Responsibility	➤ Usually prepared and/or funded by the project proponents	➤ Conducted independently of any specific project proponent, generally by a mandated body or jointly

¹⁷ These two roles of EIA are interconnected and must be considered together for good decision-making: scientific understanding of impacts should influence values and priorities, and values and priorities should influence science and the consideration of science in decision-making. EIA is a process to facilitate these interactions between natural science and the values and priorities of those potentially affected.

¹⁸ REAs are yet to be reflected in the text, although they could be considered as a component of SEAs. REAs were discussed at a January 2020 European Union hosted workshop for BBNJ negotiators (see European Union workshop on Environmental Impact Assessments and Strategic Environmental Assessments in Areas Beyond National Jurisdiction, Brussels, 28-29 January 2020. Hills, J.M. (2020) *Report of the Workshop "Environmental impact assessments and strategic environmental assessments in areas beyond national jurisdiction"*, 28–29 January 2020, Brussels, Belgium).

3.1 Environmental impact assessment (EIA)

EIA is a process for evaluating the likely impacts of a specific proposed activity on the environment and to assist in the planning and environmental management by providing “clear, well organized information on the environmental effects, risks, and consequences of development options and proposals” (Partidário, 2003). EIA is the primary tool used by regulatory authorities across the world to ensure that the environmental protection goals are met in approving projects (Morgan, 2012; Sadler, 1996) and many financial institutions require EIAs prior to authorizing funding (Castaneda, 1992).

While early EIA practice focussed on avoiding and mitigating the worst impacts of a proposed project, this approach has been widely criticised as ineffective (Cashmore et al., 2004; Jay et al., 2007a). Contemporary EIA practice therefore seeks to account not only for environmental impacts, but also potential benefits, risks, and uncertainties, including social and economic aspects, thereby enabling decision-makers to maximize the net contribution to sustainability (Doelle and Sander, 2020; Jay et al., 2007b; McCluskey and João, 2011).

Box 2: Common elements of EIA processes (Lily and Roady, 2020)

- Screening to determine whether an activity is likely to cause significant environmental effects.
- Scoping available data and key issues; identifying additional studies needed for the assessment. Often there is a formal process for consultation to refine the key issues to study.
- Baseline studies on the status of the receiving environment.
- Assessment of impacts and identification of mitigation options.
- Environmental reporting, generally in the form of an environmental impact statement (EIS) and supporting documentation.
- Submission, evaluation and [conditioned] consent, wherein the regulatory authority.

The revised draft BBNJ Agreement contains two alternative definitions of EIA, with many brackets reflecting a lack of consensus:¹⁹

[7. Alt. 1. “Environmental impact assessment” means a process to evaluate the environmental impact of an activity [to be carried out in areas beyond national jurisdiction [, with an effect on areas within or beyond national jurisdiction]] [, taking into account [, inter alia,] interrelated [socioeconomic] [social

and economic], cultural and human health impacts, both beneficial and adverse].]

[7. Alt. 2. “Environmental impact assessment” means a process for assessing the potential effects of planned activities, carried out in areas beyond national jurisdiction, under the jurisdiction or control of States Parties that may cause substantial pollution of or significant and harmful changes to the marine environment.]

¹⁹ Article 1.1.

In the transboundary and ABNJ context, a core part of the EIA process is consultation with, and participation of, other States, experts, the public, and other stakeholders, as well as follow-up measures, such as monitoring of the ongoing environmental impacts (Lily and Roady, 2020).

3.2 Strategic environmental assessment (SEA)

SEA is a tool used for assessing the environmental implications of governmental policies, plans or programmes, as well as future developments in a region or sector (Noble, 2000; Partidário, 1999; Sadler and Verheem, 1996). An SEA process provides an opportunity to engage stakeholders well before a decision is made to proceed with a certain plan, policy or activity, and to study the range of potential impacts, including cumulative impacts and climate considerations (Doelle and Sander, 2020). SEAs can also be useful prior to introducing novel activities or technologies to provide a strategic overview of development options and interactions (Warner, 2016; Warner et al., 2018). The outcomes of an SEA process can provide valuable baseline data and understanding that can inform subsequent EIAs of specific projects (see Section 6.1 for how SEAs could be further elaborated in the BBNJ Agreement).

SEA is tentatively defined in the revised draft BBNJ Agreement as:²⁰

[1.13: “Strategic environmental assessment” means the evaluation of the likely environmental, including health, effects, which comprises the determination of the scope of an environmental report and its preparation, the carrying out of public participation and consultations, and the taking into account of the environmental report and the results of the public participation and consultations in a plan or programme.]

The revised draft article on SEAs provides:²¹

1. States Parties, individually or in cooperation with other States Parties, shall ensure that a strategic environmental assessment is carried out for plans and programmes relating to activities [under their jurisdiction or control,] [conducted] [with impacts] in areas beyond national jurisdiction, which meet the threshold/criteria established in article 24.

[2. As one type of environmental assessment, strategic environmental assessments shall follow mutatis mutandis the process set out in this Part.]

3.3 Regional environmental assessment (REA)

REAs are the broadest type of environmental assessment, aiming to assess the status of the environment in a designated ocean area, together with the cumulative and individual impacts of past, present, and future human activities upon that system (Doelle and Sander, 2020). REAs are particularly well suited for integrating predicted climate change and other environmental changes over time as well as various scenarios for future developments (Doelle and Sander, 2020). REAs combined with integrated and systematic monitoring are also a foundational step towards assessing and maintaining ocean health (Franke et al., 2020).

An REA process could entail an initial baseline study of the region in question to gain a foundational understanding of the ecosystem (e.g. physical, chemical and biological parameters and function). Such a study could assess conditions important for a potential mesopelagic fishery, such as regional distribution, temporal variability, trophic relationships, ecosystem function, ecological or oceanographic connectivity, and resilience and recovery estimates. As the mesopelagic remains data poor and the majority of these baseline attributes are unknown, an REA could be used as a first step to guide future research priorities to enable better informed decision-making (see Section 6.2 for how REAs could be integrated into the BBNJ Agreement).

²⁰ Article 1.13.

²¹ Article 28.

3.4 Emerging best practice standards for environmental assessments

The BBNJ Agreement presents an opportunity to overcome the fragmented patchwork of rules for activities affecting BBNJ. Doelle and Sander (2020) identify 12 elements for EA processes that

can make them an effective governance tool for sustainability. In combination, they could support the aims of the BBNJ Agreement by enhancing cooperation and coordination, ensuring more coherent approaches across ocean uses and within and between regions, while advancing capacities for implementation.

Table 3: Elements of “next generation” environmental assessments (based on Doelle & Sander, 2020)

Element	Description	Evaluation criteria
Integrated, tiered assessments	<p>Tiering enables the results from one level of assessment to inform and be transferred to another level. Three tiers include EIAs, SEAs and REAs.</p> <ul style="list-style-type: none"> ➤ EIAs are project level assessments ➤ SEAs are policy, plan or programmatic level assessments used to integrate environment and biodiversity early on in policy formulation and planning stages. ➤ REAs are the broadest assessment for understanding, planning and management of biodiversity based on an ecosystem approach. REAs can be triggered wherever there is significant development or environmental pressure. <p>It is important to set out the role for each tier, how the tiers are integrated, and what happens at the project level when there are gaps at the regional or strategic levels.</p>	<p>Are multiple, interactive and integrated assessments required?</p> <p>Does the EA regime set out the role for each tier, how that role is integrated, and how gaps are dealt with?</p>
Cooperative assessments	<p>Joint design and implementation of assessments can serve as an important starting point for encouraging relevant bodies and instruments to cooperate. Joint REAs can be particularly helpful as a process that combines, compiles, and synthesizes the underpinning environmental and other data to feed into SEAs and EIAs and other future coordinated actions.</p>	<p>Are there provisions to enable joint design and implementation of REAs?</p> <p>Do EA processes enable broad participation and sharing of data?</p>
Assessment streams	<p>Scale and complexity of projects may vary greatly. The inclusion of different substantive and procedural demands based on scale, potential significance of adverse effects and benefits, and potential for public interest and concern can allow for more efficient assessment of undertakings of different character. Failure to do this effectively can lead to a narrow range of proposals being assessed, or to inefficient and ineffective processes.</p>	<p>Do the varying types of EA processes provide for different substantive and procedural requirements depending for example on the potential scale and significance of adverse effects?</p>
Traditional and local knowledge	<p>EA processes need to be designed and implemented to ensure the appropriate treatment of local and traditional knowledge in the assessment process. For ABNJ this includes, e.g., connectivity of species and marine processes, best practices for environmental management, traditional navigation skills, and marine species of cultural importance (Mulalap et al., 2020; Vierros et al., 2020).</p>	<p>Do EA processes enable and encourage the consideration of local and traditional knowledge in the assessment process?</p>

Element	Description	Evaluation criteria
Transparency & accountability	Transparency and accountability are both key to effective EA. Transparency is about timely access to information, access to the process itself, and access to how decision-makers use the information to reach conclusions and recommendations. Accountability adds the expectation that the process and the project decision-makers will demonstrate they are acting in accordance with the objectives of the process, and are accountable when they are not, including through recourse to challenge decisions. Without transparency and accountability, “EA risks becoming little more than a process to justify decisions made well before the EA process commences” (Doelle and Sander, 2020).	Do the EA processes provide for transparency and accountability of the decision makers?
Sustainability-based assessment & decision-making	Sustainability-based assessments can widen the scope beyond just biophysical effects by adding a range of other impacts, benefits, risks, and uncertainties such as health, gender, culture, equity in distribution of effects, and inter-generational distribution. Sustainability-based criteria can be guided by the SDGs and other decision-criteria.	Does the assessment and decision-making process include broad sustainability-based decision-criteria? Are decision-criteria guided by equity and the SDGs?
Comparative evaluation of alternatives	Comparative evaluations can reveal the implications of predicted impacts and benefits of a proposed undertaking. Alternatives considered should include the option to not proceed as well as range of activities that might achieve the same societal needs, purposes, and objectives. To achieve this, assessment activities should be integrated into the planning process, and REAs and SEAs should be conducted prior to project based assessments.	Do the EA processes ensure an effective comparison of alternatives? Does the EIA build on a prior REA and SEA?
Cumulative effects	REAs and SEAs are particularly useful for assessing cumulative effects, but cumulative effects need to be considered at all tiers to understand the potential interaction of the proposed undertaking with other future developments. “The process should recognize that all effects are cumulative, and that any reduction in the resilience of natural systems will constrain what we can do in the future” (Doelle and Sander, 2020).	Does the EA process require consideration of cumulative effects, including climate change-related effects?
Meaningful public participation	Public participation needs to begin early and continue through to the monitoring and follow-up stages. “Effective public participation requires flexibility, good judgement, and an openness to allowing public concerns to affect the outcome of an assessment” (Doelle and Sander, 2020).	Does the EA process allow for meaningful public participation?
Mutual learning oriented	EAs can serve as a special opportunity to develop common ground and mutual learning. “A key goal of EA should be to find ways to pursue self-interest in a manner that is aligned with the interests of others and ultimately, the public interest. EA processes need to be designed to encourage this change in mindset, through early engagement, engagement suitable for those affected, a demonstrably independent and impartial process, an openness to issues of concern to those who engage, full transparency and accountability, and clear decision-criteria” (Doelle and Sander, 2020).	Is the EA process designed for mutual learning for all involved? Is it designed to serve as an opportunity to develop common ground?
Monitoring & follow-up	Monitoring of the actual effects is essential for an effective EA process. Monitoring can confirm compliance, assess the accuracy of predictions, and allow course correction or enforcement action. Sharing of information via e.g. a clearing-house mechanism can ensure lessons are passed on to improve predictions for future proposals.	Does the EIA require monitoring and a follow-up process to confirm compliance, assess accuracy and enable course corrections?
Independent & impartial administration	Independent and impartial administration is essential to ensuring the legitimacy of EA processes. “Those who lack this independence or impartiality can still be given responsibilities in the process, but only with sufficient law and policy guidance and accountability” (Doelle and Sander, 2020). Provisions for transparency and accountability are central, as are provisions to ensure that any discretionary power will be exercised in the public interest.	Is the potential for bias understood and guarded against?

4. Existing international legal framework

4.1 General overview

Many international agreements and bodies may be relevant to the governance of a potential mesopelagic fishery (see Table 4 and Sections 4.2–4.10 below), but these provide only general obligations, principles and guidance:

- Five regional fisheries management organizations (RFMOs) focus largely on traditional straddling or highly migratory fish stocks, such as tuna, and would not have a clear mandate to manage mesopelagic fisheries.
- The non-tuna RFMOs have generally focussed on managing a small number of species and protecting the seabed from the impacts of

bottom fishing, but their legal mandates appear to include mesopelagic species. Requirements for environmental assessment of exploratory fishing generally focus on the sustainability of the target stock itself, with limited or no consideration of the potential impacts on ecosystem services (such as carbon sequestration or food webs) or consultation with non-members.

- A range of conservation-focussed conventions provide useful guidance but are not routinely applied by sectoral bodies with a mandate in ABNJ. Existing agreements and guidelines for EIAs and SEAs focus on activities in one state likely to affect another State, rather than on the environment itself.

Table 4: Key elements of the international ocean governance framework and their relevance to mesopelagic fisheries

Instrument	Summary	Relevance for mesopelagic fisheries
UNCLOS	A general "Constitution for the Ocean", setting out the rights and obligations of States in the marine environment.	No specific provisions. General duty to protect the environment and broad provisions on fisheries sustainability.
UNFSA	Provides further guidance on States' duties to cooperate on fish stock management and sets out key principles, such as precaution.	No specific provisions. Requires cooperation through Regional Fisheries Management Organisations (RFMOs).
RFMOs	Regional organisations where States cooperate to manage high seas fish stocks. Either focus on tuna or non-tuna fisheries ("general RFMOs").	General RFMOs have broad mandates to regulate all non-tuna fisheries; to date, they have largely focused on bottom fisheries.
FAO Code of Conduct for Responsible Fishing	Sets out general principles applicable to all fisheries.	No specific provisions.
UN General Assembly Resolution 61/105	Adopted to ensure that the principles of the Fish Stocks Agreement are applied also to discrete high seas fish stocks. Requires prior assessment of sustainability and biodiversity impacts, and positive finding of no significant adverse impact on "vulnerable" deep seafloor ecosystems as conditions for approving proposed fisheries.	No specific provisions as resolution focuses on the protection of "vulnerable marine ecosystems" from "significant adverse impacts" caused deep-sea bottom fisheries.
FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas	Describes measures necessary to implement UNGA Resolution 61/105 and provides a definition of "significant adverse impacts".	No specific provisions as Guidelines focus on deep-sea fisheries where the fishing gear interacts with the seafloor.
Convention on Biological Diversity	Broad treaty aiming to ensure conservation and sustainable use of biodiversity.	Each Contracting Party to identify processes and categories of activities which have, or are likely to have, significant adverse impacts on the conservation and sustainable use of biological diversity and monitor their effects through sampling and other techniques.

4.2 United Nations Convention on the Law of the Sea (UNCLOS, 1982)

UNCLOS provides an overarching “Constitution for the Ocean” (Koh, 1982). Under UNCLOS, all States enjoy freedom of the high seas, but this right is contingent upon corresponding duties to protect and preserve the marine environment, rare and fragile ecosystems and the habitat of depleted, endangered, and threatened species and other forms of marine life (Freestone, 2012; Freestone et al., 2006).²² With respect to living resources of the high seas, all States have a duty to take such measures as may be necessary for the conservation of the living resources,²³ but conservation activities to date have focused primarily on the monitoring and management of a small percentage of fish species (Crespo et al., 2019; Wright et al., 2016), rather than biodiversity as a whole (Ban et al., 2014; Gjerde et al., 2008; Wright et al., 2018).

UNCLOS provides a clear legal basis for EA through its requirements to:

- assess potential effects of activities;²⁴
- cooperate to promote studies, research programmes and exchange of information and data and to “endeavour to participate actively in regional and global programmes to acquire knowledge for the assessment of the nature and extent of pollution, exposure to it, and its pathways, risks and remedies”;²⁵
- provide scientific and technical assistance to developing States for the protection and preservation of the marine environment and the prevention, reduction and control of pollution, including through assistance concerning the preparation of environmental assessments;²⁶

➤ cooperate to observe the risks and effects of pollution, and to monitor the effects of nationally permitted activities;²⁷ and

➤ take all measures to avoid causing damage by pollution to other states or ABNJ.²⁸

4.3 United Nations Fish Stocks Agreement (UNFSA, 1995)

UNFSA clarifies and strengthens the obligations contained in UNCLOS relating to straddling and highly migratory fish stocks. It sets forth general principles to guide implementation including the ecosystem approach, assessment and reduction of impacts, protection of biodiversity, collection and sharing of data, promotion of scientific research and enforcement of measures.²⁹ The Agreement also explicitly requires States Parties to adopt a precautionary approach in all stages of fisheries management, including decision-making, data gathering, information sharing, addressing uncertainties, and for assessing new and exploratory fisheries (See Box 3).

With regards to exploratory fisheries, UNFSA calls for “the assessment of the impact of the fisheries on the long-term sustainability of the stocks”,³⁰ but does not require a comprehensive environmental assessment. The exploratory fisheries provisions are thus more akin to an assessment of how many fish can be sustainably harvested, rather than an assessment of the potential impacts of a proposed fishery on marine biodiversity as a whole (i.e. including food webs, habitats, and wider ecosystem services).³¹ While there is an ongoing obligation to assess the impact of fishing on these components and to adopt plans for their conservation, these actions are not required prior to the commencement of a new fishery.

²² UNCLOS Articles 192 and 194.5.

²³ UNCLOS Articles 116–11.

²⁴ UNCLOS Article 206.

²⁵ UNCLOS Article 200.

²⁶ UNCLOS Article 202.

²⁷ UNCLOS Article 204.

²⁸ UNCLOS Article 194(2).

²⁹ UNFSA Article 5.

³⁰ Article 6(6).

³¹ URFMOs can nonetheless implement more comprehensive requirements. The SPRFMO provisions on exploratory fishing, for example, explicitly require: “details of non-target and associated or dependent species and the marine ecosystem in which the fishery occurs, the extent to which these would be likely to be affected by the proposed fishing activity and any measures that will be taken to mitigate these effects”. See Box 4.

Box 3: Selected elements of the precautionary approach in the UN Fish Stocks Agreement (Article 6)

- States shall apply the precautionary approach widely to conservation, management and exploitation of straddling fish stocks and highly migratory fish stocks in order to protect the living marine resources and preserve the marine environment.
- States shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.
- States shall take into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities on non-target and associated or dependent species, as well as existing and predicted oceanic, environmental and socio-economic conditions;
- Where the status of target stocks or non-target or associated or dependent species is of concern, States shall subject such stocks and species to enhanced monitoring in order to review their status and the efficacy of conservation and management measures.
- For new or exploratory fisheries, States shall adopt as soon as possible cautious conservation and management measures, including, inter alia, catch limits and effort limits. Such measures shall remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment shall be implemented. The latter measures shall, if appropriate, allow for the gradual development of the fisheries.

4.4 FAO Code of Conduct for Responsible Fishing (1995)

The FAO Code of Conduct sets out general principles applicable to all fisheries akin to the UNFSA.³² In the case of new or exploratory fisheries, the Code echoes UNFSA in calling for the adoption of cautious conservation and management measures where data is insufficient to assess the impact of the fisheries “on the long-term sustainability of the stocks”.³³ Like UNFSA, the Code does not call for a prior assessment of impacts on marine biodiversity.

4.5 UN General Assembly Resolution 61/105 (2006)

Resolution 61/105 was adopted to address the need to manage discrete high seas fish stocks that were not covered under the UN Fish Stocks Agreement,³⁴ such as deep-sea bottom fisheries, both to ensure sustainable fisheries and to protect marine biodiversity.

The resolution also contains specific decision-making criteria that States and RFMOs are to apply to “vulnerable marine ecosystems”

³² Paras. 6.5 & 6.13.

³³ FAO Code of Conduct, Para 7.5.4.

³⁴ I.e. high seas fish stocks that are not highly migratory or straddling. For further discussion, see Takei (2013).

(VMEs), such as cold-water corals, i.e. they must assess the potential impacts of fisheries on VMEs and require that fisheries not be allowed to proceed unless it can be demonstrated that it can be managed in a way that avoids significant adverse impacts (Gianni et al., 2016; Wright et al., 2016). While these provisions were not developed to protect mesopelagic ecosystems, they are similarly vulnerable, so the well-established criteria in resolution 61/105 could provide a precedent for developing more broadly applicable standards.

4.6 FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas (2009)

The International Guidelines describe key measures necessary to implement UNGA Resolution 61/105. The Guidelines provide a definition of “significant adverse impacts”, i.e. impacts that compromise ecosystem integrity in a manner that:

- impairs the ability of affected populations to replace themselves;
- degrades the long-term natural productivity of habitats; or
- causes, on more than a temporary basis, significant loss of species richness, habitat or community types.

While the International Guidelines provide a precedent for the management of environmental impacts of high seas fisheries and a potential basis for provisions in a BBNJ Agreement, they were developed for fishing gear that is likely to contact the seafloor during the normal course of fishing operations and therefore do not apply to mesopelagic fisheries (which would use mid-water nets that do not interact with the seafloor). Mesopelagic fisheries could similarly impair the ability of affected populations to replace themselves, affect productivity, and cause significant loss of species richness – the three listed criterion

for significant adverse impacts. The FAO criteria are also narrow, as they do not consider the impacts of fisheries on vulnerable species caught as bycatch or on ecosystem services such as carbon sequestration. They also do not mention trophic web impacts on non-fishery species (such as endangered cetaceans and seabirds) whose abundances could be affected by reduction of their mesopelagic forage species.

4.7 FAO International Action Plan to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU, 2001)

The FAO Action Plan on IUU Fishing is a voluntary instrument that seeks to eliminate unregulated and unreported fishing in addition to illegal fishing, owing to its impact on the sustainability of fish stocks and on marine biodiversity. “Unregulated” fishing is defined as fishing “in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law”.³⁵ Thus, any fishery commenced without a prior assessment of sustainability and biodiversity impacts would be strongly discouraged by the international community.

4.8 Convention on Biological Diversity (CBD, 1992)

The CBD is broadly aimed at conservation and sustainable use of biodiversity, as well as the equitable sharing of the benefits derived from genetic resources. Its jurisdictional scope distinguishes between components of biodiversity within the limits of national jurisdiction and processes or activities under a Contracting Party's jurisdiction or control (regardless of whether these occur within or beyond the limits of national jurisdiction).³⁶

³⁵ <http://www.fao.org/iuu-fishing/en/>; <http://www.fao.org/3/y1224e/Y1224E.pdf>

³⁶ Article 4.

Accordingly, the CBD provisions regarding processes and activities would be applicable to Contracting Parties who authorize activities that take place in, or may cause damage to, marine biodiversity in ABNJ.³⁷

The CBD requires each Contracting Party to identify processes and categories of activities which have, or are likely to have, significant adverse impacts on the conservation and sustainable use of biological diversity and monitor their effects through sampling and other techniques.³⁸ It requires an EIA to be conducted for activities that are “likely to have significant adverse impacts” on biodiversity,³⁹ which appears to be a more precautionary standard than that set out in UNCLOS. The CBD also calls for Contracting Parties to introduce “appropriate arrangements” to ensure that environmental consequences of national programmes and policies likely to have a significant adverse impact on biodiversity are duly considered. Such arrangements are akin to a SEA, though the Convention does not specifically refer to strategic assessments.

In 2012 the CBD published voluntary guidelines for the consideration of biodiversity in EIAs and SEAs in marine areas with a focus on ABNJ.⁴⁰ The Guidelines highlight the particularities of the open ocean and deep sea – limited scientific understanding, higher uncertainties, and unequal access to knowledge – underscoring the importance of the precautionary approach, stakeholder involvement, transparency and good quality information. These particularities may be even more pronounced in the deep-pelagic environment where many fishes are far rarer than in coastal waters. As a “rare” mesopelagic fish may only meet a few of its kind over the course of a lifetime, removal of a small number could have an effect beyond the footprint of fishing operations.

4.9 Convention on Migratory Species (CMS, 1979)

CMS Parties have passed a resolution⁴¹ recognizing that the “application of impact assessment procedures to support the Convention’s implementation is implied in a number of provisions” (Kelly, 2004). The resolution emphasizes that “avoidable detriment to migratory species often occurs as a result of inadequate prior assessment of the potential environmental impacts of projects, plans, programmes and policies” and urges Parties to include “as complete a consideration as possible of effects on migratory species” in EIA and SEA processes (Kelly, 2004). Furthermore, a wide range of subsidiary agreements have been established under the CMS,⁴² several of which require or recommend EIA (Doelle and Sander, 2020).

4.10 Regional level environmental assessment processes

4.10.1 Espoo Convention (1991)

Adopted within the framework of the UN Economic Commission for Europe (UNECE), the Espoo Convention⁴³ is the only international treaty specifically dedicated to environmental assessments. The Convention contains many widely accepted best practice obligations, standards and procedures for notification, sharing of information and consultation. The Convention covers transboundary contexts only, i.e. where activities in one State may negatively impact the environment in another.

The Kiev Protocol on Strategic Environmental Assessment to the Espoo Convention (2003) aims to “provide for a high level of protection of the environment” by requiring States Parties to en-

³⁷ Articles 3 & 4.

³⁸ Article 7(c).

³⁹ Article 14.

⁴⁰ CBD decision XI/18, Voluntary Guidelines contained in UNEP/CBD/COP/11/23 <https://www.cbd.int/doc/meetings/cop/cop-11/official/cop-11-23-en.pdf>

⁴¹ Resolution 7.2.

⁴² See <https://www.cms.int/en/cms-instruments/agreements>.

⁴³ Convention on Environmental Impact Assessment in a Transboundary Context, 1991 (amended 2017 – (ECE/MP.EIA/21/Amend.1) https://www.unece.org/env/eia/about/eia_text.html.

sure that a SEA is carried out for plans and programmes which are “likely to have significant environmental, including health, effects”. SEAs should proactively influence policies, plans and programs during their preparation in order to integrate environmental concerns into them at an early stage.

4.10.2 Madrid Protocol to the Antarctic Treaty (1991)

The Protocol on Environmental Protection to the Antarctic Treaty contains a specific Annex for EIA of activities.⁴⁴ The Protocol sets out a tiered screening process: 1) a preliminary assessment for all activities to determine the scale of potential impact – where an activity will have less than a minor or transitory impact, it is allowed to proceed; otherwise 2) an initial environmental evaluation is required with sufficient detail to assess whether an activity may have more than a minor or transitory impact; and 3) if it is deemed likely to cause more than a minor or transitory impact, or the impact is unclear, a comprehensive environmental evaluation (CEE) is required. The draft CEE is subject to a 90-day consultation period, and review by both the Environmental Committee and the Antarctic Treaty Consultative Meeting (ATCM). Though individual States are responsible for the assessments, the consultation procedures for involving other States and review by a committee of scientific experts and the ATCM are highly relevant also for other ABNJ.

4.10.3 European Union Directives for EIA (2011) and SEA (2014)⁴⁵

The European Union (EU) EIA Directive seeks to contribute to a high level of protection of the en-

vironment and human health by harmonising project-level EIA across EU Member States.⁴⁶ The EU Directive specifies principles and provides minimum requirements regarding: the type of projects subject to assessment; the obligations of developers; the content of the assessment; and the participation of the competent authorities and the public. The EIA Directive applies to both public and private projects which “are likely to have significant effects on the environment”.⁴⁷ The objective of the EU Directive on SEA is “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes”. Both Directives serve to harmonize national standards so that all States are obliged to apply a similar high standard of assessment.

4.10.4 Regional Seas Conventions

Most of the regional seas conventions apply only to areas under national jurisdiction and contain general EA obligations that leave the specification of process and content up to the member States (Doelle and Sander, 2020). The OSPAR Convention⁴⁸ is an exception, containing two annexes on assessment of the quality of the marine environment (Annex IV) and on the protection and conservation of ecosystems and biodiversity (Annex V), which also apply to ABNJ within the OSPAR Convention area.⁴⁹ Annex IV requires Contracting Parties to cooperate in the monitoring of the marine environment, including the effects of activities and inputs. Annex V obliges Contracting Parties, individually and cooperatively, to take the measures necessary to protect the maritime area against the adverse effects of human activities so as to conserve marine ecosystems.

⁴⁴ The EIA Protocol's provisions do exclude fishing and whaling, however exploratory fisheries are subject to very strict precautionary measures under CCAMLR and commercial whaling is subject to a moratorium.

⁴⁵ DIRECTIVE 2011/92/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014, (hereafter “Directive”).

⁴⁶ Member States are free to set more stringent protective measures in accordance with the Treaty on the Functioning of the European Union (TFEU).

⁴⁷ EU EIA Directive Article 1, para 1.

⁴⁸ The Convention for the Protection of the Marine Environment of the North-East Atlantic (the ‘OSPAR Convention’), 1992.

⁴⁹ <https://www.ospar.org/convention>; https://www.ospar.org/site/assets/files/1169/pages_from_ospar_convention_a5.pdf

4.10.5 Selected Regional Fisheries Management Organizations in the area of interest

Convention on the Conservation and Management of Fishery Resources in the South East Atlantic Ocean (2001)

The seven members of the South East Atlantic Fisheries Organization (SEAFO)⁵⁰ cooperate on the management of fishery resources within the SEAFO Convention Area,⁵¹ focusing largely on bottom or near-bottom dwelling species.⁵² SEAFO's overarching objective is to ensure the long-term conservation and sustainable use of the fishery resources in its area, applying various principles, including use of best available science, precaution, and accounting for impacts on related species.

The SEAFO Protocol for exploratory fisheries focuses only on deep sea bottom fisheries. It requires prior assessment of potential impacts on VMEs, consistent with the FAO International Guidelines (see Section 4.6).⁵³ A Contracting Party seeking to conduct exploratory deep sea bottom fishing must forward a Notice of Intent to the Executive Secretary at least 60 days prior to the proposed start of the fishery for a review of potential seafloor impacts,⁵⁴ but no further provision is made for wider review of impacts or broader notification or consultation. The focus on the impacts of bottom fishing on VMEs suggests that there would not be a requirement for an assessment of biodiversity impacts prior to fishing in the mesopelagic zone.⁵⁵

Fishery Committee for the Eastern Central Atlantic (CECAF, 1967)

CECAF has only an advisory mandate, focusing mainly on research on fishery resources and building the capacity of members (Durussel et al., 2018). There is therefore no RFMO with a mandate to manage non-tuna fishery resources in the high seas area from the north of the SEAFO area off the western African coast to the southern boundary of the North East Atlantic Fisheries Commission (NEAFC).

The International Commission for the Conservation of Atlantic Tunas (ICCAT, 1969)

ICCAT is responsible for the management and conservation of tunas and tuna-like species in the whole of the Atlantic Ocean (Durussel et al., 2018). Thus, lanternfishes would be beyond ICCAT's taxonomic mandate. It is worth observing however that the tuna and tuna-like species ICCAT is responsible for frequently engage in vertical migrations between the epipelagic and mesopelagic zones and could be negatively impacted as bycatch or through trophic impacts if their mesopelagic prey is depleted. Juvenile bluefin tuna, for example, are known to rely on mesopelagic prey.

Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean (2009)

The 15 members of the South Pacific Regional Fisheries Management Organization (SPRFMO)⁵⁶ cooperate on the management of certain fishery resources within the ABNJ of the South Pacific – particularly jack mackerel and squid in the east-

⁵⁰ Angola, the EU, Japan, Namibia, Norway, the Republic of Korea, and South Africa.

⁵¹ I.e. Fish, molluscs, crustaceans, and other sedentary species. The Convention excludes highly migratory species (typically tuna and tuna-like fishes) and some sedentary species, as listed in UNCLOS.

⁵² E.g. Alfonsino, orange roughy, oreo dories, pelagic armourhead, sharks, Patagonian toothfish and deep-sea red crab.

⁵³ SEAFO CM 30/15 (12 October 2016).

⁵⁴ Ibid.

⁵⁵ Note that SEAFO has prohibited targeted fishing for deep-sea sharks and has banned the use of gillnets that entangle deep water species.

⁵⁶ Australia, Republic of Chile, People's Republic of China, Cook Islands, Republic of Cuba, Republic of Ecuador, European Union, Kingdom of Denmark (in respect of the Faroe Islands), Republic of Korea, New Zealand, Republic of Peru, Russian Federation, Chinese Taipei, the United States of America and the Republic of Vanuatu. Curaçao, Republic of Liberia and the Republic of Panama are cooperating non-contracting parties.

ern Pacific and bottom fisheries in the western Pacific.⁵⁷ The overarching objective of SPRFMO is, through the application of the precautionary approach and an ecosystem approach to fisheries management, to ensure the long-term conservation and sustainable use of fishery resources and while safeguarding marine ecosystems.

SPRFMO has adopted conservation and management measures for the main commercial species in its Convention Area – jack mackerel and jumbo flying squid⁵⁸ – as well as measures for deepwater species and exploratory fishing for toothfish, lobsters and crabs.

SPRFMO requires prior assessments for bottom fishing⁵⁹ and has prohibited the use of large-scale pelagic driftnets and all deepwater gillnets.

A mesopelagic fishery would be considered a new fishery within SPRFMO, for which a Fisheries Operation Plan (FoP) must be developed and approved by the SPRFMO Commission pursuant to CMM 13-2020.⁶⁰ The FoP must include various information to the extent it is available (see Box 5).⁶¹ Impact assessments are only required for proposed bottom fisheries (CMM 03-2020) and public consultation is only sought for bottom fishing assessments and thus would not be applicable to mesopelagic fisheries.⁶²

Box 4: SPRFMO Information requirements for Fisheries Operational Plans (CMM13-2020)

- A description of the exploratory fishery, including area, target species, proposed methods of fishing, proposed maximum catch limits and any apportionment of that catch limit among areas or species;
- Specification and full description of the types of fishing gear to be used, including any modifications made to gear intended to mitigate the effects of the proposed fishing on non-target and associated or dependent species or the marine ecosystem in which the fishery occurs;
- The time period the Fisheries Operation Plan covers (up to a maximum period of three years);

⁵⁷ Including molluscs, crustaceans and other living marine resources, but excluding sedentary species, highly migratory species as listed in UNCLOS, anadromous and catadromous species, and marine mammals, marine reptiles and seabirds.

⁵⁸ Regarding jumbo squid, there are still some shortcomings: In mid-February, 2020, SPRFMO took a significant step (after many years of discussion) and agreed on a conservation management measure specifically for jumbo squid on the high seas. “While the agreement, which goes into place in January, does not yet stipulate limits on the squid catch, it requires the gathering of data and samples to inform fishery records and vital scientific inquiries into the valuable marine creature.” See: <https://www.nytimes.com/2020/06/04/climate/jumbo-flying-squid-fishing.html>

⁵⁹ CMM 03-2020, <http://www.sprfmo.int/assets/Fisheries/Conservation-and-Management-Measures/2020-CMMs/CMM-03-2020-Bottom-Fishing-31Mar20.pdf>.

⁶⁰ TCMM 13-2020, <https://www.sprfmo.int/assets/Fisheries/Conservation-and-Management-Measures/2020-CMMs/CMM-13-2020-Exploratory-Fisheries-31Mar20.pdf>

⁶¹ Information is to include a description of the exploratory fishery, including area, target species, proposed methods of fishing, proposed maximum catch limits and any apportionment of that catch limit among areas or species; any biological information on the target species from comprehensive research and/or survey cruises, such as distribution, abundance, demographic data and information on stock identity; and details of non-target and associated or dependent species and the marine ecosystem in which the fishery occurs, the extent to which these would be likely to be affected by the proposed fishing activity and any measures that will be taken to mitigate these effects, and the anticipated cumulative impact of all fishing activity in the area of the exploratory fishery (CMM 13-2020, para 5). Duncan Currie, a long-time observer to SPRFMO, reports however that surveys and research are often limited and applicable catch limits are being set without a lot of strong evidence

⁶² CMM 13-2020.

- Any biological information on the target species from comprehensive research and/or survey cruises, such as distribution, abundance, demographic data and information on stock identity;
- Details of non-target and associated or dependent species and the marine ecosystem in which the fishery occurs, the extent to which these would be likely to be affected by the proposed fishing activity and any measures that will be taken to mitigate these effects;
- The anticipated cumulative impact of all fishing activity in the area of the exploratory fishery if applicable;
- Information from other fisheries in the region or similar fisheries elsewhere that may assist in the evaluation of the relevant exploratory fishery's potential yield, to the extent the State is able to provide this information; and
- Where the target species is also managed by an adjacent Regional Fisheries Management Organisation or similar organisation, a description of that neighbouring fishery sufficient to allow the Scientific Committee to formulate its advice.

In considering a FoP the SPRFMO SC shall provide recommendations and advice on various matters, notably including, an appropriate precautionary catch limit, the cumulative impacts of all fishing activity in the area of the exploratory fishery, the impact of the proposed fishing on the marine ecosystem and the sufficiency of information available to inform the level of precaution required and the degree of certainty with which the Scientific Committee's advice is provided. Public consultation is only sought for bottom fishing assessments and thus would not be applicable to mesopelagic fisheries.⁶³ In carrying out a decision on whether to approve the proposed mesopelagic fishery the Commission⁶⁴ is obligated to apply the precautionary approach and an ecosystem approach along with several principles, inter alia:

- Conservation and management of fishery resources shall be conducted in a transparent, accountable and inclusive manner, taking into account best international practices;

- Fishing shall be commensurate with the sustainable use of fishery resources taking into account the impacts on non-target and associated or dependent species and the general obligation to protect and preserve the marine environment;
- Full and accurate data on fishing, including information relating to impacts on the marine ecosystems in which fishery resources occur, shall be collected, verified, reported and shared in a timely and appropriate manner;
- Marine ecosystems shall be protected, in particular those ecosystems which have long recovery times following disturbance;
- Pollution and waste originating from fishing vessels, discards, catch by lost or abandoned gear and impacts on other species and marine ecosystems shall be minimised.

⁶³ CMM 13-2020. While public consultation is not specifically sought, all proposals for new exploratory fisheries are available publicly on the website at least twice (60 days prior to the SC meeting and again 45 days prior to the Commission meeting) and remain publicly available in perpetuity.

⁶⁴ Article 3 of the SPRFMO Convention

Inter-American Tropical Tuna Commission (IATTC, 1949)

The IATTC is responsible for the management and conservation of tuna and tuna-like species in the Eastern Pacific Ocean. Together with SPRFMO, these RFMOs cover nearly the entire

Southeast Pacific region, however, the northern and southern-most tips of the region are only covered by one of these RFMOs (Durussel et al., 2017). Like ICCAT, IATTC would have no taxonomic mandate to manage mesopelagic fish stocks, though the species under its remit could be impacted as bycatch or prey reduction.

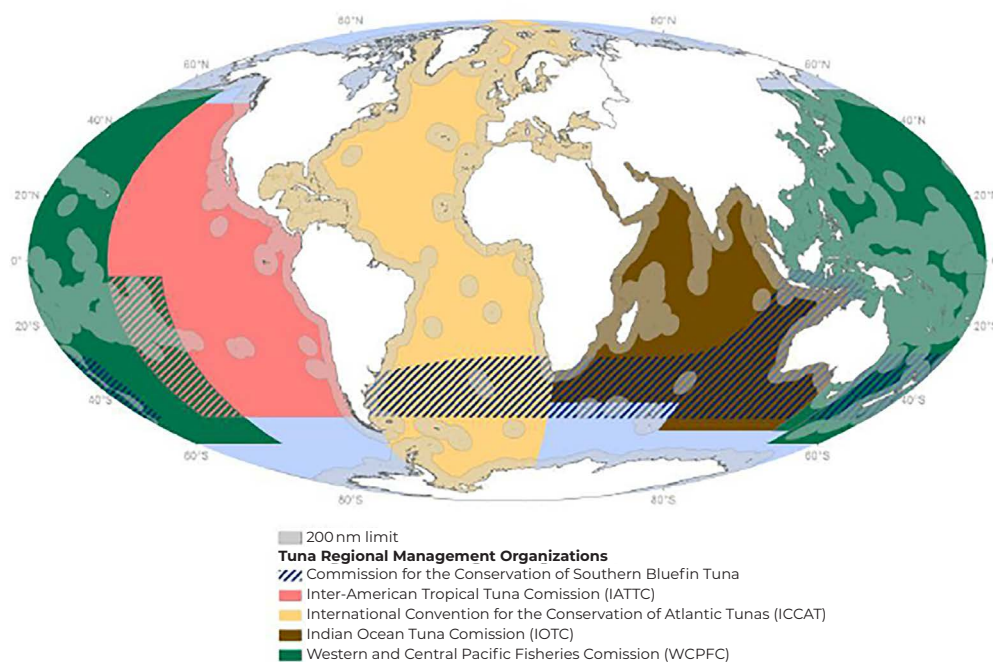


Figure 4: Tuna RFMOs⁶⁵ | Ban et al. 2014

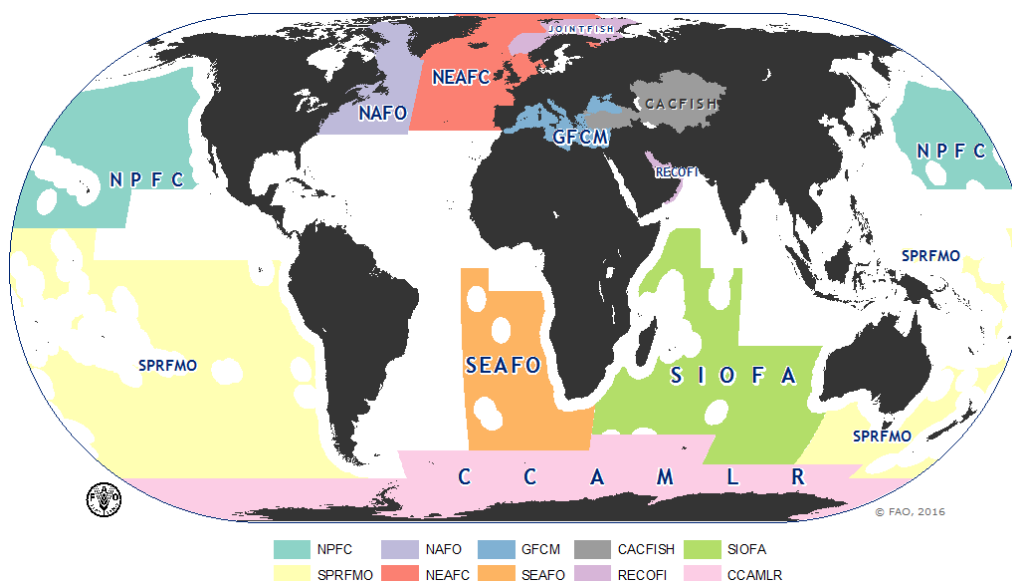


Figure 5: General RFMOs and arrangements | FAO, 2016

⁶⁵ Areas in light blue indicate no RFMO exists; all fisheries in the Southern Ocean are managed by CCAMLR.

5. Analysis of draft BBNJ Agreement provisions

The provisions for EIAs in the revised draft text span 21 articles,⁶⁶ providing a basic obligation to assess the potential effects of planned activities under their jurisdiction or control⁶⁷ and detailing a variety of different visions and approaches for fundamental issues, including:

- The objectives of the EIA provisions (which currently include: operationalise existing UNCLOS provisions for EIAs by establishing processes, thresholds and guidelines; enable consideration of cumulative impacts; provide for SEAs; and achieve a coherent EIA framework for activities in ABNJ),⁶⁸
- Procedural steps, including: screening for which activities require EIAs; defining the scope of the assessment⁶⁹ with associated thresholds and criteria;⁷⁰ and consultation and decision-making;⁷¹
- The content of assessment reports and the process for publication, consideration and review;⁷²
- Follow-up steps, such as monitoring, reporting and review of monitoring results and effectiveness of the measures adopted;⁷³
- Whether to list activities that require or do not require EIAs;⁷⁴

➤ Cumulative and transboundary impacts;⁷⁵

➤ Areas identified as ecologically or biologically significant or vulnerable;⁷⁶ and

➤ Strategic environmental assessments.⁷⁷

Much of the President's revised draft text of the BBNJ Agreement regarding EIAs currently remains in brackets and there are a range of major issues to be resolved, including:

- 1) **Relationship with other agreements and bodies:**⁷⁸ Should the Agreement set global minimum standards for EIA requirements applicable to all activities? Or should activities that are already subject to regulation that may require an EIA be excluded?
- 2) **Modernisation:** Should the Agreement incorporate modern best practice standards and emerging next generation elements for environmental assessments (see Section 3.4)? Or should the Agreement merely reflect existing obligations?
- 3) **Geographic scope:** Should the Agreement require EIA for all activities where the impacts meet the agreed threshold, regardless of where the activity occurs? Or should activities conducted within national jurisdiction be excluded, even if ABNJ will be impacted?

⁶⁶ Part IV, 21bis – 41. The general provisions of Part I are also relevant to environmental assessments, as they define overarching principles and approaches applicable to the Agreement as a whole.

⁶⁷ Article 22.

⁶⁸ Article 21 bis.

⁶⁹ Articles 30 & 31.

⁷⁰ Article 24.

⁷¹ Article 38.

⁷² Articles 32, 36–37.

⁷³ Articles 39–41.

⁷⁴ Article 29.

⁷⁵ Articles 25 & 26

⁷⁶ Article 27.

⁷⁷ Article 28.

⁷⁸ Article 23.

- 4) **Decision-making and review process:** Who takes the decision on whether an activity should proceed – States themselves, or a body constituted under the Agreement? Once a decision is taken, should there be some sort of mechanism by which a decision could be appealed? To what extent should the process be “internationalized”?

This section explores these issues through the lens of the mesopelagic case study

5.1 Relationship with other agreements and bodies

Fish are a key component of marine biodiversity and commercial fisheries may have significant impacts on biodiversity, yet progress toward precautionary and ecosystem-based management has been slow (Gianni et al., 2016; Gilman et al., 2014; Juan-Jordá et al., 2018). It is therefore critical that a BBNJ Agreement strengthens existing regulation (Cremers et al., 2020a; Crespo et al., 2019; Wright et al., 2016), yet some States have taken the position that high seas fisheries should be excluded from the scope of a BBNJ Agreement (Friedman, 2019; Scanlon, 2018; Wright et al., 2016).⁷⁹

Draft Article 23 on the “Relationship between this Agreement and environmental impact assessment processes under other relevant legal instruments and frameworks and relevant global, regional, subregional and sectoral bodies” includes many alternatives, often overlapping and conflicting. While no coherent approach emerges from the draft text, two broad alternatives can be discerned:

- 1) The BBNJ Agreement would: set “global standards”; mandate a Scientific and Technical Body to consult and coordinate with other bodies to further develop these standards and

guidelines; and provide for global consultation and review of EIAs. Decision-making could rest with either the proponent State or the Conference of Parties could be responsible for decision-making (discussed further below). Under this vision, the proponent of a mesopelagic fishery would be required to apply the EIA standards and procedures in the BBNJ Agreement, in addition to meeting any applicable obligations under RFMO regulations.

- 2) The BBNJ Agreement would exempt proposed activities from conducting EIAs if either: a) another relevant body already has rules and guidelines in place;⁸⁰ or b) “a competent body with a mandate for EIAs already exists.”⁸¹ Depending on what wording is agreed, these exemptions may mean that even if the relevant body requires no EIA, a proposed mesopelagic fishery would be exempt from the EIA standards and procedures in the BBNJ Agreement.⁸²

Whereas the first approach provides clarity by harmonizing standards across organisations and sectors, the second approach appears to reduce clarity by raising further questions as to the applicable EIA requirements in different situations:

- An RFMO may have an assessment procedure in place for exploratory fisheries, but in practice they generally focus on management of the target stocks and consider only a limited part of the ecosystem and potential impacts (Crespo et al., 2019; Gilman et al., 2014; Juan-Jordá et al., 2018). This raises the question whether a rudimentary assessment, falling short of any standard defined in the BBNJ Agreement, would be exempted. If so, the mere existence of the RFMO provision could therefore render the BBNJ provisions inapplicable, even though the EIA ultimately conducted may not meet the standard of the BBNJ Agreement.⁸³

⁷⁹ Arguing that they are already regulated by RFMOs according to the provisions of the UNFSA, or that fisheries could be included in some form, but that no EIA would be required under the Agreement where the fishing activity could potentially be subject to an EIA under existing regulations.

⁸⁰ Article 23.4. Alt. 2.

⁸¹ Article 23.4. Alt. 3.

⁸² Article 23.4. Alt 2 & Alt 3.

⁸³ For example, SEAFO has procedures in place for exploratory fisheries, but the focus has been on mitigating the impacts of bottom fisheries on VMEs.

Recent studies have highlighted considerable variation in RFMO capacity and performance (Bell et al., 2019; Juan-Jordá et al., 2018; Pons et al., 2018), meaning that the level of scrutiny of a proposal for a new fishery could ultimately depend more on which region happens to be the subject of a proposal, rather than on conservation and management imperatives. Who conducts the EIA is also important, as decades of experience suggests that regulators tend to overvalue the activity in question relative to other considerations. Independence and impartiality of the institution running the process and making process and scoping decisions is important.

A significant portion of ABNJ remains unmanaged by a competent RFMO to manage non-tuna or tuna like fish stocks. Hence if a proposal to entirely exclude fisheries from the Agreement were to prevail, then any new fishery in large parts of the ocean would be unregulated (see Figure 1).

There may similarly be confusion where a fish stock straddles RFMO mandates – “Whilst RFMOs have generally been cognizant of each other’s activities, there has historically been relatively little imperative to formally cooperate with each other and with other competent authorities, despite the obvious relevance to broader biodiversity agreements” (Bell et al., 2019). Cooperation between RFMOs nonetheless appears to be improving, and some have established MoUs and linkages with FAO and other organisations for this purpose.⁸⁴

An additional alternative in the draft text would require a consultation to determine whether the existing EIA processes and standards are functionally equivalent and comparably comprehensive, including with respect to ecosystem effects, cumulative impacts, thresholds and effectiveness.⁸⁵ This provision would aim to ensure that best practices are applied by all sectors and emerging activities. Such a provision could be used to determine if existing procedures of RFMOs and other existing organizations provided a comparable level of review and consultation.⁸⁶

5.2 Modernization: restating existing obligations or embracing best practice?

The environmental assessment provisions in UNCLOS reflect the standards and practice developed in the 1970s (Morgan, 2012). The theory and practice of environmental assessment have since developed considerably, so the negotiations provide an opportunity to build on its basic provisions to incorporate contemporary best practice standards and processes (see Section 3.4). In this context, Table 5 compares modern best practice standards with key provisions in the draft BBNJ Agreement and the conservation measures established by SEAFO⁸⁷ and SPRFMO⁸⁸ to identify their various strengths and weaknesses compared with modern best practice (as set out in Table 3 above).

⁸⁴ SPRFMO for example has existing MoUs with CPPS, CCAMLR, WCPFC, IATTC (agreed, but not signed) and is in the process of developing one with NPFC. SPRFMO has also engaged in CBD processes and has linkages with FAO.

⁸⁵ Article 23.4. Alt. 4.

⁸⁶ Though, as noted by Doelle and Sander (2020), the preferred approach would be cooperative assessments involving all potential decision makers (e.g. the RFMO, other relevant bodies, and the body constituted under the BBNJ regime), owing to the inherent limitations of a sector-centric environmental assessments.

⁸⁷ Conservation Measure 30/15 on Bottom Fishing Activities and Vulnerable Marine Ecosystems in the SEAFO Convention Area, including APPENDIX IV – Procedures and standards for exploratory fishing in the SEAFO CA (Article 6, CM 30/15) (together SEAFO’s Exploratory Fisheries Protocol”).

⁸⁸ CMM 03-2020 (Conservation and Management Measure for the Management of Bottom Fishing in the SPRFMO Convention Area); CMM 03a-2020 (Conservation and Management Measure for Deepwater Species in the SPRFMO Convention Area); CMM 08-2019 (Conservation and Management Measure for Gillnets in the SPRFMO Convention Area); CMM 13-2020 (Conservation and Management Measure for the Management of New and Exploratory Fisheries in the SPRFMO Convention Area); CMM14a-2019 (Conservation and Management Measure for Exploratory Fishing for Toothfish by New Zealand-Flagged Vessels in the SPRFMO Convention Area); CMM 14b-2020 Conservation and Management Measure for Exploratory Potting Fishery in the SPRFMO Convention Area; CMM 14d-2020 Conservation and Management Measure for Exploratory Fishing for Toothfish by Chilean-Flagged Vessels in the SPRFMO Convention Area.

Table 5: Comparison of key BBNJ, SEAFO and SPRFMO provisions to modern best practice (cf table 3 above based on Doelle and Sander 2020)

Element	Modern best practice	BBNJ Agreement	SEAFO	SPRFMO
General principles and approaches	<ul style="list-style-type: none"> ➤ Precautionary principle ➤ Ecosystem approach ➤ Use of best available science ➤ Consideration of range of impacts: cumulative impacts, economic, social, health 	<ul style="list-style-type: none"> ➤ Includes key principles, but does not specify how they should be implemented or applied in decision-making and management ➤ Would require consideration of a broad range of impacts 	<ul style="list-style-type: none"> ➤ Exploratory Fisheries Protocol explicitly reflects the precautionary approach as a core obligation ➤ “when a shortage of information is recognized that results in high uncertainty of the assessment, then it is more precautionary to recommend rejection than approval of the exploratory fishing.” 	<ul style="list-style-type: none"> ➤ Precautionary and ecosystem approaches in Convention's core objective and a new/exploratory fishery can only commence if cautious preliminary conservation and management measures have been adopted. ➤ Decisions shall be based on the best scientific and technical information available and the advice of all relevant subsidiary bodies.
Objectives	<ul style="list-style-type: none"> ➤ Focus on biodiversity/sustainability ➤ Inclusion of firm ecological objectives 	<ul style="list-style-type: none"> ➤ Establish global standards for EIA ➤ Enable consideration of cumulative impacts ➤ Provide for SEA ➤ Achieve a coherent EIA framework for activities in ABNJ 	<ul style="list-style-type: none"> ➤ Limited to impacts of bottom fisheries 	<ul style="list-style-type: none"> ➤ Evaluate potential of new and exploratory fisheries ➤ Promote sustainable management; assist the formulation of management advice ➤ Evaluate possible impacts on target stocks and other species ➤ Ensure precautionary development of new and exploratory fisheries

Element	Modern best practice	BBNJ Agreement	SEAFO	SPRFMO
Thresholds & criteria	<ul style="list-style-type: none"> ➤ Clear precautionary thresholds ➤ Lower threshold where activity is proposed in a particularly significant/vulnerable area, or where potential impacts of activity are poorly understood ➤ Prior strategic/regional assessment can help set context-specific triggers 	<p>Multiple alternatives:</p> <ul style="list-style-type: none"> ➤ “may cause substantial pollution” or “significant and harmful changes” ➤ “likely to have more than a minor or transitory effect” ➤ Could include provision for “areas identified as biologically significant or vulnerable” 	<ul style="list-style-type: none"> ➤ Vulnerability of the potentially affected ecosystem (to bottom fishing gear impacts only) ➤ No provision for public notification or consultation ➤ No procedure for public consultation, access to information, or other input into the process for stakeholders. 	<ul style="list-style-type: none"> ➤ Proposal to conduct exploratory fishery
Notification & consultation	<ul style="list-style-type: none"> ➤ Early, continuous and meaningful consultation with full range of stakeholders ➤ Transparent process, access to all relevant information 	<ul style="list-style-type: none"> ➤ Early notification to stakeholders ➤ Effective, time-bound opportunities for stakeholder participation ➤ Transparent and proactive process ➤ Unclear who would facilitate the consultations 	<ul style="list-style-type: none"> ➤ No provision for public notification or consultation ➤ No procedure for public consultation, access to information, or other input into the process for stakeholders. 	<ul style="list-style-type: none"> ➤ Proposals for new exploratory fisheries and assessments of approved fisheries are made publicly available ➤ Public dissemination of non-commercially sensitive information and, as appropriate, facilitating consultations ➤ No provision for proactive public consultation in regard to new or exploratory fisheries ➤ No provisions on access to information or other input into the decision-making process

Element	Modern best practice	BBNJ Agreement	SEAFO	SPRFMO
Scope	<ul style="list-style-type: none"> ➤ Cumulative effects, alternatives, what environmental components to focus on ➤ Inclusion of social, economic, cultural and health impacts and benefits ➤ Full geographic range of potential impacts, regardless of where activity takes place 	<ul style="list-style-type: none"> ➤ Not yet clear if activity must take place in ABNJ or if requirement to conduct EIA is triggered when the activity potentially impacts ABNJ 	<ul style="list-style-type: none"> ➤ Limited to impacts of bottom fishing in management area ➤ No assessment of broader range of potential impacts on other species and ecosystems 	<ul style="list-style-type: none"> ➤ Limited to fisheries in management area ➤ FOP requires information on "the anticipated cumulative impact of all fishing activity in the area of the exploratory fishery if applicable"
Review & decision-making	<ul style="list-style-type: none"> ➤ Independent and impartial ➤ Review of proposal and decision-making considers full range of alternatives, including refusal of permission to proceed with activity ➤ Justification of decision based on accepted standards, such as net contribution to sustainability ➤ Ongoing monitoring and follow-up ➤ Process to challenge decision 	<ul style="list-style-type: none"> ➤ Decision could be left to States, but COP could provide a more impartial review and decision-making process. ➤ Decision makers could be asked to justify their decision against an accepted standard, such as net contribution to the sustainability, or to the fulfilment of the SDGs, for example. 	<ul style="list-style-type: none"> ➤ Scientific Committee reviews and make recommendations ➤ Decision made by Commission Members ➤ No mechanism by which the decision can be reviewed or decision-makers can be held accountable. Unclear if any process is in place for monitoring and follow-up 	<ul style="list-style-type: none"> ➤ Scientific Committee reviews and provides advice ➤ Compliance and Technical Committee considers and provides advice and recommendations to the Commission on appropriate management arrangements ➤ Decision made by Commission Members ➤ No mechanism by which the decision can be reviewed or decision-makers can be held accountable ➤ Consensus decision-making process ➤ Measures are in place up to a maximum period of three years before review; fishery will be closed after 10 years unless it becomes an established fishery with adoption of a specific CMM⁸⁹

⁸⁹ If consensus is not reached, a decision can be taken by vote. Of note is SPRFMO's objection procedure which has been used twice to date and allows Members to object to a decision of the Commission and have a fair and impartial hearing of their concerns.

5.2.1 General principles and approaches (Article 5 of BBNJ revised draft text)

Under the draft BBNJ Agreement, generally agreed principles and approaches include:

- Precaution;
- An ecosystem approach;
- An approach that builds ecosystem resilience to the adverse effects of climate change and ocean acidification and restores ecosystem integrity;
- Use of best available science; and
- Non-transfer of damage or hazards.

The draft currently does not include any provision specifying how these principles and approaches are to be implemented in practice in order to guide decision-making and management. The limited implementation of existing EA provisions in UNCLOS appears to be, at least in part, due to the lack of a clear process for discharging these obligations (Warner, 2009; Wright, 2017), thus the BBNJ Agreement risks facing similar non-implementation in the absence of more concrete guidance.

SEAFO

The Exploratory Fisheries Protocol explicitly reflects the precautionary approach as a core obligation. It further specifies what to do in situations of inadequate or uncertain data: “when a shortage of information is recognized that results in high uncertainty of the assessment, then it is more precautionary to recommend rejection than approval of the exploratory fishing.” This is a substantive standard that would presumably be applicable to all decision-making.

SPRFMO

The SPRFMO Convention includes the application of the precautionary approach and ecosystem approach in its core objective,⁹⁰ as well as in the objectives of its management measures on bottom fishing and new and exploratory fisheries.⁹¹ Unlike SEAFO, SPRFMO does not specify that a proposal should be rejected if there is a shortage of information. The SPRFMO Convention instead states that a new or exploratory fishery should be opened “only when the Commission has adopted cautious preliminary conservation and management measures in respect of that fishery, and, as appropriate, non-target and associated or dependent species, and appropriate measures to protect the marine ecosystem in which that fishery occurs from adverse impacts of fishing activities”.⁹² SPRFMO also specifies that “new and exploratory fisheries should not be permitted to expand faster than the acquisition of information necessary to ensure that the fishery can and will be developed in accordance with the principles set out in [the SPRFMO Convention]”.⁹³ In practice, the lack of an environmental impact assessment and approach of only requiring stated information “to the extent it is available” does not require in-depth investigations prior to fishing, does not implement the precautionary approach and would likely be inadequate for a mesopelagic fishery.

BBNJ Agreement and best practice standards

The draft BBNJ Agreement would appear to require consideration of a broad range of impacts⁹⁴ including the wider climate impacts of removing a major component of the ocean’s biological pump, i.e. mesopelagic fishes and pelagic shrimps. However, the draft BBNJ agreement lacks an objective or decision-making criterion that would require caution to be exercised in

⁹⁰ Article 2.

⁹¹ CMMs 03-2020 & 03a-2020 and CMM 13-2020 respectively.

⁹² Article 22.1.

⁹³ CMM 13-2020, preamble.

⁹⁴ Article 5.

the face of uncertain or inadequate information. To reflect best practice, the BBNJ Agreement could include explicit recognition that precaution should be favoured in such cases and that a proposal should not be allowed to proceed. The Agreement could also include, as in the SPRFMO Convention, a provision requiring that new activities not be permitted to expand faster than the science.⁹⁵

5.2.2 Triggering an EIA: thresholds and criteria (Article 24)

The draft BBNJ Agreement provides multiple alternatives for triggering an EIA:

- Alt 1: An EIA would be required when States Parties either have “reasonable grounds” for believing planned activities either “may cause substantial pollution” or “significant and harmful changes” (i.e. the existing UNCLOS threshold),⁹⁶ or if the activities “are likely to have more than a minor or transitory effect” (as in the 1992 Madrid Protocol – see Section 4.10.1).
- Alt 2: Combines the two thresholds contained in Alt 1 by calling for an initial EIA if a planned activity “is likely to” have more than a minor or transitory effect, and a more comprehensive EIA if the activities “may” cause substantial pollution or significant and harmful changes. This alternative in part reflects the more modern tiered approach used in the Madrid Protocol, which includes an initial pre-screening step based on the lower threshold.⁹⁷ The purpose of the initial assessment is to provide sufficient detail to assess whether a proposed activity may have more than a minor or transitory effect. This is especially important when the effects are poorly understood. This sort of tiering process could provide an incentive to expand the knowledge base before making important decisions.

SEAFO

The trigger specified in the Exploratory Fisheries Protocol reflects a third approach, based on vulnerability of the potentially affected ecosystem to bottom fishing gear impacts. SEAFO requires an assessment of any exploratory bottom fishery that has the potential to cause significant adverse impacts on VMEs. Criteria for identifying “significant adverse impacts” and VMEs are contained in the FAO Guidelines. The focus on activities where fishing gear is likely to contact the seafloor means however that no assessment is required to determine the broader range of potential impacts on other species and ecosystems.

SPRFMO

The trigger for SPRFMO member States and CNCPs is based on the desire to conduct exploratory fishing in the Convention Area.⁹⁸ A secondary trigger is the 3-year limit for both exploratory and bottom fishing measures. An EIA is also triggered after 10 years, when an exploratory fishery transitions to an established fishery with a focused CMM.

BBNJ Agreement and best practice standards

The vulnerability-based trigger used by SEAFO is partially reflected in the draft BBNJ Agreement in a provision on “Areas identified as biologically significant or vulnerable”,⁹⁹ though this provision currently remains in brackets. Such a provision could be important to enable a more coordinated site-specific approach by automatically requiring EIAs for planned activities in, or with the potential to affect, such areas. These areas can be identified according to widely recognized criteria concerning vulnerability, rarity, spawning grounds, or other areas of potential

⁹⁵ The Agreement could further support this effort by strengthening monitoring, control and surveillance (MCS), e.g. by encouraging electronic monitoring and observers (Bradley et al., 2019) or requiring an MCS strategy for new activities (Cremers et al., 2020a).

⁹⁶ Article 206.

⁹⁷ Note that the draft text stipulates a higher threshold than the Madrid Protocol, which requires a pre-screen for any project that is not determined to have less than a minor or transitory effect.

⁹⁸ CMM 08-2019.

⁹⁹ Article 28.

ecological or biological significance. An additional precautionary trigger could always require an EIA when the effects of the proposed activity are unknown or poorly understood.¹⁰⁰ Prior regional environmental assessments can be of great value in setting triggers that reflect region-specific contexts.

5.2.3 Public notification and consultation (Article 34)

The draft BBNJ Agreement requires early notification to stakeholders and effective, time-bound opportunities for stakeholder participation throughout the assessment process. There is broad agreement that the public notification and consultation process should be transparent and proactive. The provision highlights the particular importance of considering comments concerning potential transboundary impacts. It is currently unclear who would facilitate the consultations – text that would authorize the COP to facilitate consultation at the international level remains in brackets.

In the case of mesopelagic fisheries, States and stakeholders including other RFMOs may wish to be engaged as their interests in avoiding impacts on shared resources (including those that manage species that could become bycatch of a new fishery), biodiversity or ecosystem services could be adversely affected.

SEAFO

The Exploratory Fisheries Conservation Measure contains no provision for public notification or consultation, other than between Contracting Parties, and leaves it to the Scientific Committee to conduct the review and make recommendations to the Commission. There is no procedure for public consultation, access to information, or providing input into the process by stakeholders including potentially affected States.

SPRFMO

Fishery resource assessments of approved fisheries have to be made publicly available by the Commission,¹⁰¹ but there is no provision for proactive public consultation in regard to new or exploratory fisheries,¹⁰² nor any provisions on outside input into the decision-making process. Proposals for new exploratory fisheries are made available publicly as the Convention mandates public dissemination of non-commercially sensitive information and, as appropriate, facilitating consultations with, and the participation of, non-governmental organisations, representatives of the fishing industry, particularly the fishing fleet, and other interested bodies and individuals. Assessments submitted for bottom fishing, including the review conducted by the Scientific Committee, must be made publicly available on the SPRFMO website and can be commented on.¹⁰³ The reports of the Scientific Committee and reports of member States implementation of CMMs must also be made publicly available.¹⁰⁴

BBNJ Agreement and best practice standards

The absence of consultation processes in SEAFO and SPRFMO for non-members and other non-RFMO stakeholders means that there is less opportunity for notification, consultation or meaningful public participation. The process is only passively transparent and does not include any mechanism by which the decision-makers can be held accountable. It is unclear if any process is in place for monitoring and follow-up. While review and approval by the Scientific Committee and Commission provides some independent and impartial oversight based on clear criteria and a precautionary approach, the assessment is nonetheless led by the proponent of the fishery and there is no provision to solicit non-RFMO stakeholder input. This is

¹⁰⁰ See IUCN commentary for 24.1. Alt.2(1)(c).

¹⁰¹ SPRFMO Convention, Article 23.

¹⁰² CMM 13-2020.

¹⁰³ CMM 03-2020, Article 23.

¹⁰⁴ SPRFMO Convention, Articles 10.3 & 24.

especially concerning in the case of a potential mesopelagic fishery, as the impacts could affect biodiversity and ecosystem services at the regional and even global scale. The consultation procedures under the draft BBNJ Agreement are much more inclusive and rigorous, though these too are lacking in terms of precautionary substantive standards and decision-criteria.

5.3 Scope: Activities or effects in ABNJ?

The provisions of the draft BBNJ Agreement regarding the “obligation to conduct environmental impact assessments”¹⁰⁵ reflects the basic obligation under UNCLOS for assessing the potential effects of planned activities under State jurisdiction or control. The draft does not yet clarify whether the activity itself must take place in ABNJ for the provisions to apply or if the EIA requirement is triggered when the activity potentially impacts ABNJ.

Focusing on the impacts of an activity within or across jurisdictional boundaries, rather than the location where the activity takes place, is in accordance with an ecosystem approach and would be an important step towards proper implementation of existing UNCLOS obligations that require States to take all measures necessary to “ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention”¹⁰⁶ (see Cremers et al. 2020 and Payne et al, 2020).

Given that not all domestic EIA laws and regulations reflect contemporary standards, basing the need for an EIA on where the activity occurs could also lead to uncertainty and incoherence

and result in EIAs of varying quality. To the extent that individual countries do require prior notification and consultation (as required by the CBD),¹⁰⁷ national agencies and scientists may lack the capacity or knowledge to effectively review the proposal.

There is precedent in UNFSA for an agreement focused on ABNJ to also address areas within national jurisdiction: to ensure coherence in management of straddling and highly migratory fish stocks, provisions on the compatibility of conservation and management measures also apply within areas under national jurisdiction.¹⁰⁸ Under UNCLOS, States are already required to adopt laws and regulations for marine pollution, “taking into account internationally agreed rules, standards and recommended practices and procedures.”¹⁰⁹ The BBNJ Agreement could accordingly stipulate internationally agreed rules applicable to activities with effects on biodiversity in ABNJ.

5.4 Review and decision-making process

Given the critical global importance of mesopelagic ecosystems, the international community’s interest in their conservation and management should be reflected in EA review and decision-making processes. However, as previously noted, RFMOs generally do not make provision for such input and passive transparency is insufficient to ensure proactive and inclusive consultation. This is especially the case for BBNJ generally, and for poorly understood ecosystems and species in particular, as many States lack the capacity to review the impact of novel activities. A central scientific body under the BBNJ Agreement could help to ensure access to the best available science and knowledge and provide States with the knowledge required to effectively review new proposals and impact

¹⁰⁵ Article 22.

¹⁰⁶ Article 194(2).

¹⁰⁷ Article 14.

¹⁰⁸ Articles 5-7. UNCLOS provisions on anadromous and catadromous stocks (Articles 66 & 67) also connect ABNJ and national waters in a similar way, for example by placing additional consultation and management requirements on high seas fishing for stocks that originate in waters under State jurisdiction (Article 66(3)(a)).

¹⁰⁹ Article 207.

assessments. The scientific and technical body and other bodies can both benefit from and contribute to outcomes of the UN Decade of Ocean Science and other scientific initiatives (Yadav and Gjerde, 2020).

The Conference of Parties (COP) could be in a better position to ensure an impartial review and decision-making process, as it is supposed to represent the international community's interest in a healthy ocean in ABNJ. If such deci-

sions are left to individual States, there is a real risk of forum or jurisdiction shopping so that EIAs can be conducted under “flags of convenience”. There is also a need for an option for States to challenge substandard assessments. At minimum, some “backstop” mechanism under which one State or group of States can ask the Scientific and Technical Advisory Body to review an EIA, or ask the COP to review a decision to proceed with an activity that is considered to be inconsistent with the BBNJ Agreement.

Box 5: Summary of key conclusions

- Currently, established sectoral management bodies may not be well equipped or fully mandated to assess the potential effects of proposed activities on marine biodiversity or ecosystem services in ABNJ, to consider cumulative or climatic impacts or to engage proactively in public notification, consultation, independent review, and consideration of alternatives to a proposed fishery. Thus, no activity or sector should be excluded from the EIA requirements in the BBNJ Agreement.
- Common standards for environmental assessment processes can foster coordination and cooperation across sectors and regions through improved information exchange, cross-sectoral consultation, and consideration of cumulative and trans-boundary effects.
- The BBNJ Agreement can enhance coherence through its substantive standards and procedural obligations. While the current draft procedural obligations reflect emerging best practices that could provide important opportunities for meaningful consultation and public participation, the some of the draft alternatives that reflect weak and/or sector specific substantive standards could lead to inconsistent results at the regional as well as global ocean scale even within individual sectors.
- Few States have the requisite access to knowledge or expertise required to supervise or review an EIA in the remote and understudied realms in ABNJ. An internationalised EIA process that is transparent, independent and impartial, supported by enhanced scientific cooperation through a clearing-house mechanism, could help ensure a fully integrated multi-disciplinary perspective, and support collaborative arrangements that allow other States to also participate and benefit.

6. Potential role of strategic and regional environmental assessments

This section considers how SEAs and REAs can help to overcome the challenges of operating in the remote ocean where often there is insufficient or inadequate information upon which to make an informed decision. If mesopelagic fisheries or other new or expanded activities were to be considered, such assessments could play an important role in promoting a precautionary and science-based approach, addressing cumulative impacts while enhancing cooperation, coordination, coherence and capacity at the regional scale.

6.1 Strategic Environmental Assessments

A SEA is often “characterized by the goal of mainstreaming and up-streaming environmental considerations into strategic decision-making at the earliest stages of planning processes to ensure they are fully included and appropriately addressed”.¹¹⁰ With respect to EIAs, SEAs can help to overcome current challenges such as lack of baseline information, limited understanding of connectivity and ecosystem services and the constraints of the single sector approach. SEAs may further help to pre-empt conflicts between users and between uses and the marine environment. As part of a more integrated approach, SEAs could reveal potential cumulative biophysical as well as social, health and cultural effects while also taking into account climate considerations. SEAs can also be an asset to good governance by increasing stakeholder involvement, transparency, and access to good quality information.

Provisions on SEA nonetheless remain basic and some details are disputed in the draft BBNJ Agreement, due in part to a limited understanding of how SEAs might be implemented in ABNJ. Implementation may indeed be challenging in ABNJ as there is currently no practical experience, however, there is a wealth of experience concerning regional cooperation, including in relation to ABNJ, that could provide valuable lessons and inspiration (Wright et al., 2017; Wright and Rochette, 2018).

Objectives

By way of example, the objective of the EU Directive 2001/42/EC on SEA¹¹¹ is “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that...an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment”.

In the fisheries context, the Australian Environment Protection and Biodiversity Conservation Act (EPBC, 1999) requires that all Commonwealth managed fisheries with an export component undergo assessment to determine the extent to which management arrangements will ensure that the fishery is managed in an ecologically sustainable way (Warner, 2020).

¹¹⁰ UNEP/CBD/COP/11/23.

¹¹¹ Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0042>.

Trigger

The EU SEA Directive triggers a SEA where there is the potential for a “significant effect on the marine environment”. According to the CBD Voluntary Guidelines,¹¹² a SEA would be appropriate when a plan, policy or programme could affect marine ecosystems and their components directly (e.g., increasing mortality, habitat loss or increasing pollution) or indirectly (e.g., habitat fragmentation, introduction of alien species, diseases). In the BBNJ context, where new activities and technologies may emerge prior to being regulated (such as mesopelagic fisheries), SEAs could also be particularly useful for centralizing and ensuring access to the best available information and knowledge.

Stages

The stages of a SEA process include: an initial determination of the scope of an environmental report (current status and trends, pressures as well as the environmental risks and other concerns involved in the proposed new policy, plan, programme or activity); preparation of the report; consultations and participation of the public; and the taking into account of the environmental report and the results of the public participation and consultations in decision-making; and monitoring and evaluation. Some of these stages are reflected in the definition of SEA in the draft BBNJ Agreement.¹¹³

Tools for SEAs

According to the CBD Voluntary Guidelines,¹¹⁴ the SEA process involves a “family of tools that identifies and addresses the environmental consequences and stakeholder concerns in the development of policies, plans, programmes and other high-level initiatives”. These include tools to predict environmental and socio-economic

effects, tools to ensure full participation of stakeholders, and tools for analysing and comparing options (OECD, 2006). A further element in any SEA process is ongoing monitoring of the implementation of particular policies, plans and programmes to determine any adverse unforeseen environmental or health effects so as to undertake remediation (Warner, 2020; Warner et al., 2018).

Coordination of the SEA process

The draft BBNJ Agreement currently envisages that it would be the responsibility of “States Parties, individually or in cooperation with other States Parties,” to ensure that a SEA is carried out.¹¹⁵ However, the implementation of SEAs is likely to require a high degree of collaboration between individual States Parties and global and regional organizations with ABNJ responsibilities. An individual State Party or even a small group of States Parties may lack the capacity, expertise, or authority to coordinate such a process. Alternative options could be to charge the COP with the responsibility to coordinate SEAs. The COP could then have the option of devolving authority to the Scientific and Technical Body, to an existing body, or to an ad hoc coordination mechanism.¹¹⁶ The Scientific and Technical Body could be charged with further developing the framework.

Regional benefits

SEAs can further foster regional-scale cooperation to deliver global ambitions in a way that EIAs cannot, as EIAs are often limited to a specific sector, location, and time. SEA processes broaden the spatial and temporal range of environmental assessment to cover multiple sectors or geographic areas to inform decision-making on a long-term basis (Warner, 2020). The conduct of a SEA for a specific region can help to

¹¹² CBD decision XI/18, Voluntary Guidelines contained in UNEP/CBD/COP/11/23 <https://www.cbd.int/doc/meetings/cop/cop-11/official/cop-11-23-en.pdf>

¹¹³ Articles 1.13 & 28.

¹¹⁴ CBD decision XI/18, Voluntary Guidelines contained in UNEP/CBD/COP/11/23 <https://www.cbd.int/doc/meetings/cop/cop-11/official/cop-11-23-en.pdf>

¹¹⁵ Article 28.

¹¹⁶ E.g. The COP could constitute an ad hoc committee that include States who may have a particular interest or stake in the outcome.

forge a shared environmental economic and social vision for the region at an early stage in decision-making that enables a “proper consideration of alternatives and cumulative impacts as well as engaging those affected by proposed developments” (Zou, 2019). SEAs in marine regions can thus provide important background information for project based EIAs and future area-based management tools (ABMTs) such as the existence of ecologically or biologically significant marine areas (EBSAs)¹¹⁷ and VMEs¹¹⁸ and patterns of multi-sectoral use in the region to inform any future spatial planning (Warner, 2020).

6.2 Regional Environmental Assessments

Even where the best available scientific information is applied to an EIA or SEA, large data gaps and uncertainties may persist. As evidenced by the challenges of applying SEAFO’s exploratory fisheries protocol to an activity that the protocol is not intended to cover, reliance on one governmental agency’s knowledge base about potential impacts may not be sufficient to ensure informed decision-making.

REAs are the broadest tier that may serve to collate and synthesize the best available information about a region, as well as identify information gaps and research priorities. Access to information, consultation, participation, transparency, accountability, and precaution are all required elements for best practice environmental assessments. An REA could be particularly useful prior to taking decisions regarding a new type of activity or development that may have regional- or global-scale implication, as well as for assessing the status of ongoing activities. The harvest of lanternfish (Myctophid) fish stocks from the mesopelagic realm may be one such example – when scaled up, exploitation has

the potential for significant impacts on the food web and the biological pump for carbon sequestration, as well as other ecosystem services (Choy et al., 2017; Jin et al., 2020; St. John et al., 2016).

In the context of a lanternfish fishery, the EIA, SEA and REA processes would add to our understanding of the fishery, moving beyond a relatively limited EIAs approach to an SEA that considers a broader range of services that mesopelagic fishes are likely responsible for. An REAs could then capture the broad spatial scales needed for any stock-type assessments in mid-water. It would also be important to understand oceanographic conditions, relevant sea-floor topography, and diel migrations.

REAs are also advised for assessing, anticipating and informing responses to the impacts of rising environmental pressures due to climate change-related effects and other human and environmental changes. It can further enable States to incorporate temporal and spatial dynamics that take into account changes in the vertical and horizontal distribution of biodiversity on a seasonal basis, and increasingly, due to climate change (Ortuño Crespo et al., 2020; Payne et al., 2019; Pentz et al., 2018; Pinsky et al., 2018).

As part of a tiered approach to EAs, REAs can streamline subsequent EIA and SEA processes by making information relevant to screening, scoping and consideration of effects and alternatives easily accessible and digestible.

Objective

Achieve a coherent environmental assessment framework for activities in ABNJ including through regional environmental assessments, strategic environmental assessments and environmental impact assessments.

¹¹⁷ Convention on Biological Diversity (CBD), Ecologically or Biologically Significant Areas (EBSAs), <https://www.cbd.int/ebsa/>

¹¹⁸ Food and Agricultural Organization (FAO), *Vulnerable Marine Ecosystems (VMEs)*, <http://www.fao.org/in-action/vulnerable-marine-ecosystems/en/>

Trigger

REAs could be triggered wherever there is significant development or environmental pressure. REAs will become an increasingly important tool as climate-related changes alter ocean biology, chemistry and even physics.

Stages

Regional assessments can include descriptions of the existing biological, chemical, physical, and historical characteristics; identification of sensitive habitats and areas; identification of areas of human activities; analyses of ecosystem conditions; and assessments, forecasts, and modelling of cumulative impacts (Caldow et al., 2015; IOPTF, 2010).

Tools

Baseline studies and sampling remain fundamental, while standard monitoring and assessment tools that could be applied to REAs include long term ocean observation networks, buoys and autonomous surface and underwater vehicles. These tools can increasingly be complemented by recent advances that are increasing the feasibility and reducing the costs of monitoring and assessing the health and status of large ocean areas (Borja et al., 2016). As noted by Borja et al. (2016) and others, there are four promising approaches that can be combined in novel ways:

- **Acoustic sampling and monitoring devices** can be used to determine the biomass and abundance of the mesopelagic fauna including their depth distributions and migratory behaviours (Proud et al., 2018). Bioacoustics on saildrones provide valuable large-scale, quasi-synoptic coverage of mesopelagic systems (De Robertis et al., 2019)
- **Remote sensing** from satellites has recently been extended to monitor phytoplankton, including its size structure, composition, and functionality, and to monitor harmful algal

blooms as well as sargassum influxes (Ody et al., 2019; Wang et al., 2019). Any at-sea net sampling and/or acoustic survey should be accompanied by remote sensing characterization of mesoscale oceanographic features, as the latter represents the environmental “habitat” in which pelagic populations naturally vary.

- **Biophysical and ecological modelling** tools can increase spatial extrapolation of environmental variables and predict spatial distribution patterns of different ecosystem components (Borja et al. 2016). Ecological modelling is increasingly used to understand and ultimately predict the consequences of anthropogenic and climate-driven changes in the natural environment on the distribution, composition and structure of marine ecosystems. These techniques are just now being applied to mesopelagic ecosystems.
- **Genomic tools** may prove a cost-effective complement to net sampling in order to assess community biodiversity, understand food webs and trophic interactions, detect invasive species, and understand connectivity. It is critical to note that genetic techniques require an accurate reference library with museum-curated vouchers for calibration. These genomic tools are already being applied to reveal new insights about mesopelagic communities (LaCapra, 2019).

Coordination of the REA process

REAs would benefit from some high-level global oversight to provide support, encourage participation, and to enable comparison and interoperability between regions, but could also be designed and implemented as a regional level cooperative initiative with relevant bodies and instruments (based on a mandate from the BBNJ Agreement COP). REAs could thus involve potentially affected coastal States, flag States, other interested States, existing bodies such as RFMOs, the IMO and regional seas organizations, as well as the wider scientific community,

other sectors and civil society. A collaborative REA process could be supported by the compilation and sharing of the underlying data, as well as provide the platform for further collaborative activities based on a common understanding of baseline conditions and trends. To ensure legitimacy and buy in, it would be important to follow best practice standards (see Section 3.4).¹¹⁹

Regional benefits

REAs can advance the scientific basis for regional-scale implementation of the BBNJ Agreement. The process of conducting an REA can galvanize cross-sectoral cooperation to compile and assess information from multiple sectors and disciplines, thereby ensuring all stakeholders have a far more sophisticated understanding of what is known and any knowledge gaps that might need to be filled in order to make informed decisions. By improving knowledge of status, trends and drivers of change, REA can thereby enable planning ahead, avoiding conflicts, support ABMTs and cross-sectoral marine spatial planning processes, as well as streamline EIA processes. They can further contribute to good governance by facilitating public engagement, including by regional institutions, and provide a basis for public scrutiny.

REAs could further strengthen and enhance cooperation in marine scientific research and the development and transfer of marine technology as envisaged. This may also entail an additional obligation to conduct further research as needed to address the major gaps and uncertainties, and to collaborate more broadly in environmental assessments (as already required by UNCLOS).

Capacity

Regional environmental assessments can identify capacity needs for strengthening ecosystem-based management and the Ecosystem Approach to Fisheries and thereby provide the basis to address them through the appropriate capacity building and training programme(s). This could include building and supporting capacity for scientific monitoring of the ecosystem and its resources (including data collection, compliance monitoring and reporting to support science-based decision-making and implementation) as well as building capacity for adaptive, solutions-based ecosystem and fisheries management and institutional support. Environmental assessments could also provide a mechanism to support equitable and sustainable use and development of MGR as many tools and technologies related to MGRs are key to understanding, managing and sustaining ocean health. Training and equipment to use these tools could be made an explicit part of the benefit sharing and capacity building and technology transfer elements on the BBNJ Agreement, thereby helping to fulfil existing UNCLOS obligations (Harden-Davies and Gjerd, 2019).

¹¹⁹ A Regional environmental assessment has already been developed to guide future deep seabed mining activities as part of a Regional Environmental Management Plan for the Mid-Atlantic Ridge. However, such a single sector efforts can lack many of the cross-sectoral, consultative and cooperative elements required to reflect best environmental practice (Doelle and Sander, 2020; Jones et al., 2016) and may miss key ecological components not within the expertise of any one selected expert. For example, the Regional Environmental Assessment for the Mid Atlantic Ridge prepared for the International Seabed Authority's workshop did not examine the important role of gelatinous prey and predators in the mesopelagic ecosystem that may also be affected by deep seabed mining. Participation in the workshop was also limited: invitees had to possess either: 1. Good knowledge of and/or experience in implementing the legal, policy and management frameworks for the activities in the Area with a focus on polymetallic sulphide deposits; and 2. Expertise and experience in environmental protection and biodiversity conservation in mid-ocean ridges as well as polymetallic sulphide resource exploration (see <https://www.isa.org.jm/files/files/documents/REMP-NMAR-a.pdf>). Civil society observers and other ocean users are not entitled to attend even though the workshop would address key areas of environmental policy and impact other users.

7. Concluding reflections

An effective tiered system of environmental assessments can support integrated ecosystem-based management in ABNJ.

The accelerating effects of climate change on the ocean are of increasing concern and need to be reflected in all levels of management. Ocean warming, heat waves, deoxygenation, ocean acidification and shifts in currents and productivity (IPCC, 2019) are creating further demands for proactive measures to build ecosystem resilience and restore integrity on top of accelerating direct human impacts. International bodies and agreements will increasingly need to incorporate climate change considerations into management decisions. Marine resources that are also an important carbon sink will need to be given further consideration to their value in mitigating climate change as a global good as opposed to one-time consumptive use.

RFMOs will need to improve their assessment of climate vulnerability of targeted species, bycatch and ecological indicators, just as other sectors will benefit from broader consideration of climate vulnerabilities and cumulative impacts. The BBNJ Agreement can help provide overarching principles as well as EIA and other frameworks for decision-making with the objective of building further climate resilience.

The case study on mesopelagic fisheries reveals the importance of not excluding any type of activity or sector from the BBNJ Agreement, of ensuring a high level of uniform standards to implement the general principles under the agreement to better build resilience to climate change, to consider all potential and cumulative impacts, and inject precaution into management and decision-making processes. It further underscores the importance for ensuring broad based consultations beyond a single sector to embrace other sources of knowledge and values.

To safeguard biodiversity in the high seas and deep sea in ABNJ, the BBNJ Agreement will need to address both individual projects and larger development plans and policies. Strategic environmental assessments are an important complement to EIAs as they can ensure that environmental considerations inform and are integrated into such strategic decision-making in support of environmentally sound and sustainable development. SEA enable broad transparent and inclusive consultation and participation, provide a system-wide perspective, and facilitate early comparisons of alternatives and strategies, which serves to reduce risk to both industry and environment.

Regional environmental assessments, accompanied by ongoing observation and marine scientific research, will be fundamental to implementing many of the goals and objectives of the BBNJ Agreement. Regional environmental assessments can enhance collaboration by enabling the collective identification of key environmental priorities and projects in ABNJ. Collaboration in research can enhance the capacity and access to technology for scientists from developing and developed countries, which in turn can lift institutional capacities for informed decision-making.

In short, effective environmental assessment processes are essential to good governance, as they increase stakeholder involvement, transparency, accountability and access to good quality information. Such elements can ensure that decision-makers are able to demonstrate they are acting in accordance with the objectives of the process or can be held accountable when they are not. Best practice environmental assessments also help to underscore the reality that all effects are cumulative, and that any reduction in the resilience of natural systems will constrain what we can do in the future.

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ViSdP

Prof. Dr. Mark G. Lawrence, Managing Scientific Director

January 2021



About the STRONG High Seas project

The STRONG High Seas project is a five-year project that aims to strengthen regional ocean governance for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction. Working with the Secretariat of the Comisión Permanente del Pacífico Sur (CPPS; Permanent Commission for the South Pacific) and the Secretariat of the West and Central Africa Regional Seas Programme (Abidjan Convention), the project will develop and propose targeted measures to support the coordinated development of integrated and ecosystem-based management approaches for ocean governance in areas beyond national jurisdiction (ABNJ). In this project, we carry out trans-disciplinary scientific assessments to provide decision-makers, both in the target regions and globally, with improved knowledge and

under- standing on high seas biodiversity. We engage with stakeholders from governments, private sector, scientists and civil society to support the design of integrated, cross-sectoral approaches for the conservation and sustainable use of biodiversity in the Southeast Atlantic and Southeast Pacific. We then facilitate the timely delivery of these proposed approaches for potential adoption into the relevant regional policy processes. To enable an interregional exchange, we further ensure dialogue with relevant stakeholders in other marine regions. To this end, we set up a regional stakeholder platform to facilitate joint learning and develop a community of practice. Finally, we explore links and opportunities for regional governance in a new international and legally-binding instrument on marine biodiversity in the high seas.

Project duration: June 2017 – May 2022

Coordinator: Institute for Advanced Sustainability Studies (IASS)

Implementing partners: BirdLife International, Institute for Sustainable Development and International Relations (IDDRI), International Ocean Institute (IOI), Universidad Católica del Norte, WWF Colombia, WWF Germany

Regional partners: Secretariat of the Comisión Permanente del Pacífico Sur (CPPS), Secretariat of the Abidjan Convention

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Partners of the STRONG High Seas project:

