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Overlapping and fragmentation in the protection and conservation of the marine environment in areas beyond national jurisdiction

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Marine areas beyond national jurisdiction (ABNJ) are under the growing threat of cumulative anthropogenic impacts including fishing, shipping, energy extraction, certain forms of marine scientific research, and the imminent deep seabed mining that prefigure a critical scenario in terms of biodiversity loss and environmental degradation. This article offers a contribution to the discussion on the best approaches to effectively implement environmental protection and conservation in ABNJ, also in the light of ongoing intergovernmental negotiations on the conclusion of an agreement implementing the United Nations Convention on the Law of the Sea on the conservation and sustainable use of biological diversity in ABNJ. The paper first analyzes the current legal gaps in the protection and conservation of ABNJ and the tools developed by some regional and universal regimes to preserve vulnerable marine ecosystems. It then presents two case studies, relating to hydrothermal vent fields of the Mid Atlantic Ridge (Lost City) and the South-West Indian Ridge (Longqi field) to discuss the fragmentation of the legal regimes applicable to ABNJ as well as the difficult cooperation among the regional, global and sectoral frameworks involved in their governance. The case studies show that a coordination mechanism, based on mutual recognition of the protection and conservation measures taken by each competent organization in a specific field, is of utmost urgency. Only a more structured system of cooperation among States and international organizations, that the new implementation agreement will hopefully develop, will allow for the identification of the most appropriate tools for the protection of a given marine area from the cumulative impacts of human activities.

KEYWORDS

United Nations Convention on the Law of the Sea (UNCLOS), biodiversity beyond national jurisdiction (BBNJ), International Seabed Authority (ISA), marine protected areas (MPAs), area-based management tools (ABMTs), bottom fishing, marine scientific research (MSR), regional environmental management plan (REMP)

1 Introduction

The ocean covers 71% of the surface of the Earth, of which, marine areas beyond national jurisdiction (ABNJ) represent 54% of the seabed (the Area) and 64% of the ocean's surface and nearly 95% of the ocean's volume (the High Seas). The ocean therefore represents the largest biome on Earth. Yet marine organisms represent only 2% of the total number of known animal species (Briggs, 1994), albeit showing a higher degree of biodiversity compared to terrestrial ones. Although some authors relate this occurrence to a lower magnitude of environmental variability than on land, the lack of knowledge especially in the relatively undiscovered deep sea (Mayer et al., 2018) prevents a full comparative assessment in terms of biodiversity richness and status. Despite the scarce ocean knowledge, signs of stress and rapid decline in global marine biodiversity have soon become visible at all scales (Sala and Knowlton, 2006) including species extinctions (Dulvy et al., 2003), population depletions, and habitat homogenization due to overfishing, climate change, alien species introduction and pollution (McCauley et al., 2015).

In this regard, in the 2021 report of the Second World Ocean Assessment, a pool of 300 world scientists has voiced the incumbent risks of biodiversity loss (United Nations, 2021), especially in areas beyond national jurisdiction (ABNJ, i.e. the High Seas and the seabed and subsoil beyond the limits of national jurisdiction¹). Similarly, in its 2020 State of World Fisheries and Aquaculture, the United Nations Food and Agriculture Organization reported a worrying trend towards the overexploitation of fish resources, with a consistent increase in stocks taken at biologically unsustainable levels, including in ABNJ (Food and Agriculture Organization, 2020).

The ocean is considered a new economic frontier (blue economy) as land-based resources have become fully exploited or exhausted, including food, minerals for the energy transition, novel bioactive compounds (Jouffray et al., 2020). Deep-sea marine ecosystems are facing unprecedented pressures from human activities that sum up with stresses from warming, heat waves, ocean acidification, that affect the ocean as climate regulator (Levin et al., 2015). Therefore, the numerous, intensive and cumulative anthropogenic impacts of fishing, shipping, even certain forms of marine scientific research (MSR), and the imminent deep seabed mining prefigure a critical scenario in terms of the ability of the ocean not only to sustain this pressure (Ardito and Rovere, 2022) but to continue providing those ecosystem services necessary for life on Earth (Mejjad and Rovere, 2021).

¹ These maritime zones are defined under the United Nations Convention on the Law of the Sea, but have long been recognised under international customary law too.

The international community has adopted so far several international legal instruments of a sectoral or regional character that can contribute to mitigate and possibly halt environmental degradation and biodiversity loss in the deep ocean. However, the legal framework for the sustainable use, protection, and conservation of marine biodiversity in ABNJ still remains highly fragmented and inadequate, representing one of the most debated issues of today's international law of the sea (Rothwell et al., 2017).

This article aims at identifying legal gaps and at offering a contribution to the discussion on the best approaches to respond to the urgency of seabed impacts and biodiversity loss in ABNJ, also in the light of ongoing intergovernmental negotiations on the conclusion of an agreement implementing the United Nations Convention on the Law of the Sea on the conservation and sustainable use of biological diversity in ABNJ (BBNJ agreement)².

To this end, this paper adopts a multidisciplinary approach that combines scientific evidence and legal analysis in the field of protection and conservation of marine ABNJ.

2 Legal gaps in the protection and conservation of the marine environment

The main and most important agreement in the field of the protection and preservation of the marine environment is the 1982 United Nations Convention on the Law of the Sea (UNCLOS)³. As a living instrument, the UNCLOS shall be read in the light of the evolution of customary international law on the protection of the environment and taking into account the conclusion of further sectoral and regional treaties in the field. Soft law instruments, programmatic global environmental agendas, as well as the pertinent international and national jurisprudence are also relevant for the evolutionary interpretation of the UNCLOS.

In a bid to allocate sovereignty and jurisdictional rights, the UNCLOS divides marine spaces on a horizontal and vertical

² 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, Further 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, 1 June 2022, UN. doc. A/CONF.232/2022/5.

³ United Nations Convention on the Law of the Sea, concluded on 10 December 1982, entered into force on 16 November 1994, 1833 UNTS 397 [UNCLOS].

axes. From the former point of view, it distinguishes areas within national jurisdiction, that include the territorial sea, the contiguous zone, the exclusive economic zone, and the continental shelf; and ABNJ, made up of the High Seas and the seabed and ocean floors beyond national jurisdiction the UNCLOS refers to as the Area⁴ (Andreone, 2015).

On a vertical axis, the UNCLOS differentiates, both within and beyond national jurisdiction, the legal regimes that apply to the seabed and to the suprajacent water column (Tanaka, 2019).

As far as the legal regime applicable to the Area and its mineral resources is concerned, under article 136 of the UNCLOS, they are declared the common heritage of mankind (CHMK)⁵ (Kiss, 1982). This legal principle, as implemented by Part XI of the UNCLOS, has the following legal and operational implications: a) the prohibition of any claim or exercise of sovereignty over the Area and its resources (article 137); b) all activities of exploration for and exploitation of mineral resources are to be carried out for the benefit of mankind and the revenues arising from them ought to be shared among the international community (article 140); c) the Area shall only be used for peaceful purposes (article 141); d) the Area and its resources shall be preserved in the interest of the present and future generations, consistently with the provisions of article 145 of the UNCLOS; and (e) activities in the Area shall take place through the management of an *ad hoc* international mechanism, that is the International Seabed Authority (ISA or Authority) (article 156) (Brown, 1983; Wolfrum, 1983; Joyner, 1986; Pinto, 2012).

As of today, the ISA, the organization through which States Parties manage and control activities in the Area, has concluded 31 contracts for exploration of mineral resources with 22 different operators (International Seabed Authority, 2022).

The mandate of the ISA is not limited to the issuing of exploration and exploitation licenses, as the Authority also enjoys, according to article 145 of the UNCLOS, normative powers in the field of the protection of the marine environment from harmful effects which may arise from the activities in the Area (Urdiales, 2019). Moreover, according to article 143, it is required to promote and encourage MSR and increase the ocean environment knowledge. In particular, while the Authority may also carry out MSR independently, it shall cooperate with State Parties with a view to develop research programmes for the benefit of less technologically developed States and to disseminate the results of the research⁶.

Indeed, according to article 256 of the UNCLOS, all States and international organizations have the right to conduct MSR

in the Area, in conformity with Part XI of the UNCLOS⁷. While open to all States, the conduct of MSR shall abide by some fundamental principles laid down in article 240: it shall pursue peaceful purposes, be realized through appropriate means, not interfere with other legitimate uses of the sea, and respect any regulation aimed at the protection and preservation of the marine environment⁸. Finally, in line with the constitutive elements of the CHMK, article 143 also establishes that MSR shall be carried out for the benefit of mankind as a whole⁹.

With respect to the water column, the principle of the freedom of the high seas, referred to in Part VII of the UNCLOS, applies beyond national jurisdiction¹⁰. According to article 87 of the UNCLOS, it comprises, *inter alia*, freedom of navigation, fishing and of MSR. While every State has the right to exercise such freedoms, they shall take into account the interests of other States and of the international community as a whole¹¹, including the protection of the marine environment.

The inclusion in the UNCLOS of Part XII entirely dedicated to the protection and preservation of the marine environment, which is unprecedented in the codification of the international law of the sea (Van Dyke, 2004), can be considered as a limitation to full enjoyment of the freedom of the high seas. However, the anthropogenic approach remains central to the UNCLOS (Wolfrum and Matz, 2000), whose main objective is, in fact, to ensure the orderly and pacific exploitation and use of the sea and its resources. For this reason, both Part XI and Part VII contain only limited and general provisions with respect to the protection of the marine environment and its resources (Sands and Peel, 2018). Even the subsequent adoption of two implementation agreements - in 1994 on Part XI of the UNCLOS¹² and in 1995 on the provisions of the UNCLOS relating to the conservation and management of straddling fish stocks and highly migratory fish stocks (Fish Stock Agreement)¹³ - have revealed weak and inadequate to avoid

4 UNCLOS, article 1 (1) (1).

5 While the principle of the CHMK has been proposed for application in other ABNJ, the UNCLOS is the only treaty which has operationalised it.

6 UNCLOS, article 143.

7 UNCLOS, article 256.

8 UNCLOS, article 240.

9 UNCLOS, article 143

10 UNCLOS, article 86.

11 UNCLOS, article 87.

12 Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea, concluded on 28 July 1994, entered into force on 16 November 1994, 1836 UNTS 3.

13 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, concluded on 4 August 1995, entered into force 11 December 2001, 2167 UNTS. 3.

biodiversity loss in ABNJ and still remain exploitation-oriented (Tladi, 2011).

A crucial development towards a protection approach is the United Nations General Assembly (UNGA) resolution 59/25 on sustainable fisheries¹⁴. Indeed, for the first time States and Regional Fisheries Management Organizations (RFMOs), created pursuant to article 8 of the Fish Stock Agreement, are required to consider the adoption of decisions on the prohibition of certain fishing practices (Hiddink et al., 2017), including bottom trawling, with a significant impact on vulnerable marine ecosystems (VMEs), like hydrothermal vents and seamounts¹⁵. The recommendation was reiterated in 2006, with resolution 61/105, by which the UNGA called upon States to take action immediately to protect VMEs from destructive fishing practices, ‘recognizing the immense importance and value of deep sea ecosystems and the biodiversity they contain’¹⁶.

The mentioned resolutions have the merit to highlight the linkage between fisheries and biodiversity through reducing the pressure on the most vulnerable marine areas, although they do not achieve the broader goal of the conservation of the integrity of VMEs from all anthropogenic threats. This is a *vulnus* that, as this contribution will be showing, is at risk of hampering their effective protection.

A major gap stemming from the UNCLOS is the lack of strict rules in the field of environmental protection of the Area and its biodiversity (Wolfrum, 2020). Indeed, as previously mentioned, according to article 145, only mining activities in the Area are subject to an environmental monitoring by the ISA. No other human endeavor in the Area undergoes any global environmental obligation, except for the very general provision of article 192 of the UNCLOS, according to which States have to protect and preserve the marine environment. In other terms, article 145 - and any measure the ISA adopts pursuant to this provision with a view to protect the Area - is only oriented to contrast the impacts of deep-sea mining in the areas where it is carried out, rather than to protect and preserve the Area *lato sensu*¹⁷.

This is attributable to the wrong belief - which was widespread at the time when the UNCLOS was negotiated -

that the Area resembled a dark desert, characterized by low temperatures and high pressures incompatible with plant and animal life (Glowka, 1996; Mgbeoji, 2004).

Another major gap relates to the disregarded ecosystem interaction between the water column and the seabed and subsoil and to the vertical division of the whole marine environment into distinct legal maritime zones.

The sea, unlike the air, contains the nutrients necessary for the growth of microscopic plants in the water column that, further to providing half the oxygen produced by plants on Earth (Field et al., 1998), sustain the entire marine food chain, including benthic communities attached to the seabed in close relationship with the subsoil. Although most of the ocean is aphotic, benthic communities thrive in the dark deep sea relying on food webs from the water column except for chemosynthetic communities that rely on symbiotic bacteria that provide them with energy in habitats dominated by toxic compounds such as hydrocarbons and hydrogen sulfide (e.g. Bernardino et al., 2012).

This interdependence was only in part acknowledged in the preamble of the UNCLOS, which states that ‘the problems of ocean space are closely interrelated and need to be considered as a whole’¹⁸. Some authors consider this recital a reference to the ecosystem and integrated approaches to which ocean governance should be committed (Wolfrum, 2020). However, either because of the limited knowledge of the marine environment at the time when the UNCLOS was negotiated, and as a result of the division of marine areas based on a zonal approach, the UNCLOS has been unable to provide a solid basis for the coordination among the many international instruments selectively governing the protection of ABNJ with a view to ensure that ecological units are adequately safeguarded (Tanaka, 2019).

In the light of these normative gaps and of the environmental concerns voiced by the society, the international community questioned the capacity of the existing legal and institutional frameworks to adequately protect ABNJ and to conserve their biodiversity. This marked the beginning of long debates in various international fora, and particularly at the United Nations (Papastavridis, 2020).

A turning point towards a more effective protection of such ecosystems was the decision of the UN General Assembly to convene an intergovernmental conference to conclude a third agreement implementing the UNCLOS, on the conservation and sustainable use of marine biological diversity of ABNJ (BBNJ agreement)¹⁹. The negotiations, which entered a substantive

14 United Nations General Assembly, *Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments*, 17 November 2004, A/RES/59/25 [Sustainable fisheries resolution].

15 Sustainable fisheries resolution, para. 66.

16 Sustainable fisheries resolution, para. 80.

17 For a focus on this debate, see Tanaka, 2019 and Mgbeoji, 2004.

18 UNCLOS, Preamble

19 United Nations General Assembly, 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, 24 December 2017, A/RES/72/249.

phase in 2018, focus on a package deal, identified in 2011 and to be addressed together and as a whole, consisting of marine genetic resources (MGR), including questions on the sharing of benefits, measures such as area-based management tools (ABMTs), including marine protected areas (MPAs), and environmental impact assessments, capacity-building and the transfer of marine technology (Berry, 2021).

3 Area-based management tools and marine protected areas

Pending the conclusion of the BBNJ agreement, this section aims to analyze the existing legal framework allowing for the creation of ABMTs, including MPAs in ABNJ.

Among the several approaches adopted in the last decades to implement the obligations relating to the protection of the marine environment, the creation of ABMTs was considered the most useful way to tackle the need to sustainably use biological resources and to effectively protect the marine environment on a spatial basis (Vierros et al., 2016), in compliance with the relevant international environmental law and policy principles, including the precautionary and ecosystem approaches.

While no agreed definition of ABMTs exists yet, they can be described as measures designed for a geographically defined area, through which one or several sectors or activities are managed to achieve a wide variety of objectives, from the protection of specific ecological and geomorphological processes to the preservation of endangered species, to the conservation of cultural, ecological and historical sites of a recreational nature²⁰.

In line with the set management objectives, the level of protection afforded by these tools may vary considerably. Being a composite category (United Nations, 2021), ABMTs do not necessarily entail the prohibition of certain human activities, but more often promote their rational and sustainable conduct

(Frank, 2020). Indeed, the flexibility of ABMTs makes it possible to achieve a certain management and conservation goal without excessively burdening those who engage in activities that can be carried out in an environmentally sustainable way (Scovazzi, 2014). They can range from seasonal closures of marine areas to certain activities, to the creation of multipurpose MPAs, selected through scientific criteria and sometimes parts of a network (Table 1).

Despite no provision of the UNCLOS explicitly refers to ABMTs and MPAs, the power to create them, and hence their legal basis, can be found in some of its obligations. First of all, article 192 concisely establishes a general obligation for all States to protect and preserve the marine environment with no limits of application *ratione loci*, meaning that this obligation applies to all marine areas identified under the UNCLOS. Then, Article 194 (5) further requires States to take those measures necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened, or endangered species and other forms of marine life.

Furthermore, article 197 of the UNCLOS sets further key obligations for the establishment of such areas in ABNJ: the obligation to cooperate both at a procedural and a substantive level to act in good faith to this end and, at least, to participate in those fora aimed at the protection of the marine environment²¹.

As far as sustainable fisheries and marine living conservation are concerned, in 2006, with resolution 61/105 the UN plenary body requested the RFMOs not only to identify conservation areas, but also to 'immediately' take appropriate protective measures, including the closure of vulnerable sectors to bottom fishing activities²² to combat biodiversity loss from bottom trawling (Hiddink et al., 2017).

Since then, many RFMOs have adopted measures limiting bottom fishing (Caddell, 2020), especially when carried out with bottom trawls (Caddell, 2016)²³.

Several ABMTs have been established by RFMOs since the first closure established by the Northeast Atlantic Fisheries Commission (NEAFC) in 2002 in the Rockall Area, between the United Kingdom and Iceland, where bottom fishing was prohibited in the Reykjanes ridge to protect its flora and fauna (Drankier, 2012) (Figure 1A; Table 1).

20 United Nations General Assembly, *Oceans and the law of the sea – Report of the Secretary-General: Addendum*, 10 September 2007, A/62/66/Add. 2, paras. 117–118. In the last version of the BBNJ Agreement, ABMT are provisionally defined either as 'a tool, including a marine protected area, for a geographically defined area through which one or several sectors or activities are managed with the aim of achieving particular conservation and sustainable use objectives in accordance with this agreement' or as 'a tool, including a marine protected area, for a geographically designed area through which one or several sectors or activities are managed in order to achieve, in accordance with this Agreement: (a) In the case of marine protected areas, conservation objectives; (b) In the case of other area-based management tools, conservation objectives or conservation and sustainable use objectives'.

21 International Court of Justice, *North Sea Continental Shelf Cases (Germany v. Denmark; Germany v. Netherlands)*, Judgment, 20 February 1969, I. C. J. Reports 1969, p.3., para. 85.

22 Convention on the conservation and management of fishery resources in the South East Atlantic Ocean, concluded on 20 April 2001, entered into force 13 April 2003, 2221 U. N. T. S. 189

23 United Nations General Assembly, *Oceans and the law of the sea – Report of the Secretary-General: Addendum*, 10 September 2007, A/62/66/Add.2, parr. 141–174.

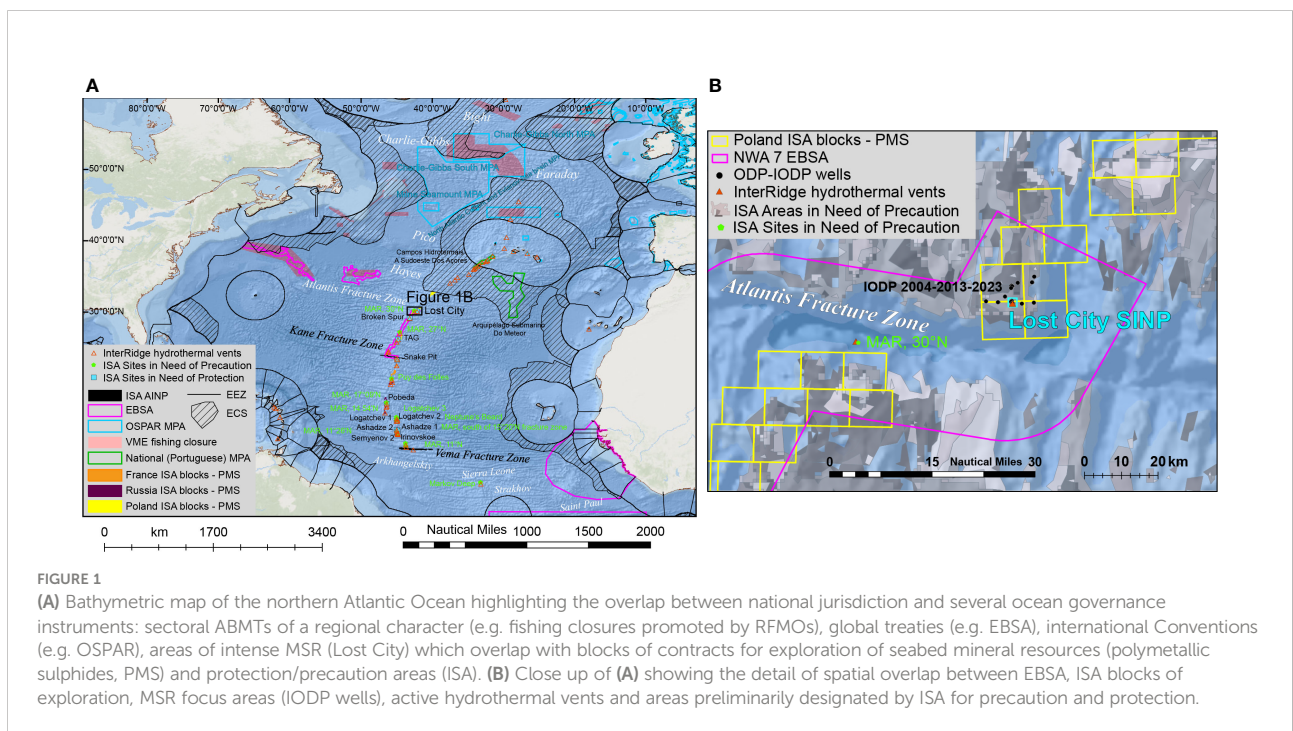
TABLE 1 List of some relevant ABMTs.

Agreement	ABMTs/MPAs	Decision	Criteria
Convention for the Protection of the Marine Environment of the North-East Atlantic	7 <i>Marine Protected Areas</i> Charlie-Gibbs South; Charlie Gibbs North; Milne Seamount Complex; Mid-Atlantic Ridge North of the Azores High Seas; Altair Seamount High Seas; Antialtair High Seas; Josephine Seamount Complex High Seas; North Atlantic Current and Evlanov Sea basin	OSPAR Decision 2010/1-2-3-4-56 24 September 2010, OSPAR 10/23/1-E, Annexes 34; 36; 38; 40; 42; 44 OSPAR Decision 2021/01 on the establishment of the North Atlantic Current and Evlanov Sea basin Marine Protected Area, 1 October 2021, OSPAR 21/13/1/Annex 23.	(a) Threatened or declining species and habitats/biotope; (b) Important species and habitats/biotope; (c) Ecological significance; (d) High natural biological diversity; (e) Representativity; (f) Sensitivity; (g) Naturalness.
Convention for the Protection of the Mediterranean Sea Against Pollution	1 <i>Specially Protected Area of Mediterranean Importance</i> (Pelagos Sanctuary)	France, Italy and the Principality of Monaco sign an Agreement related to the creation of a Sanctuary for marine mammals in the Mediterranean Sea, concluded on 25 November 1999, entered into force on 21 February 2002	(a) Uniqueness; (b) Natural representativeness; (c) Diversity; (d) Naturalness; (e) Presence of habitats that are critical to endangered, threatened, or endemic species; (f) Cultural representativeness.
Convention on the conservation of Antarctic marine living resources	2 <i>CAMLR Marine Protected Areas</i> (South Orkney Islands southern shelf; Ross Sea region)	CAMLR Commission, <i>Protection of the South Orkney Islands southern shelf</i> , 6 November 2009, Conservation Measure 91-03 (2009); CAMLR Commission, <i>Ross Sea region marine protected area</i> , 28 October 2016, Conservation Measure 91-05 (2016).	(a) Representative areas; (b) Scientific areas to assist with distinguishing between the effects of harvesting and other activities from natural ecosystem changes, as well as providing opportunities for understanding the Antarctic marine ecosystem without interference; (c) Areas potentially vulnerable to impacts by human activities; (d) Locations where important ecosystem processes are amenable to spatial protection.
International Convention for the Prevention of Pollution from Ships	<i>Special Areas</i> (Mediterranean Sea; Southern Ocean) 15 <i>Particularly Sensitive Sea Areas</i>	International Convention for the Prevention of Pollution from Ships, Annex I (oil), II (noxious substances), IV (sewage), V (garbage). Adoption: 1973 (Convention), 1978 (1978 Protocol), 1997 (Protocol - Annex VI); Entry into force: 2 October 1983 (Annexes I and II) 27 September 2003 (Annex IV), 31 December 1988 (Annex V).	(a) Preventing and minimizing pollution from ships - both accidental and from routine operations (b) Special Areas with strict controls on operational discharges are included in most VI Annexes: Oil pollution; Noxious liquid substances carried in bulk pollution; Harmful substances carried in packaged form pollution; Sewage pollution; Garbage pollution; Air pollution.
International Convention for the Regulation of Whaling	2 <i>Whale Sanctuaries</i> (Indian Ocean; Southern Ocean)	International Convention for the Regulation of Whaling, Schedule, section 7 (a); International Convention for the Regulation of Whaling, Schedule, section 7 (b).	Commercial whaling, whether by pelagic operations or from land stations, is prohibited.
Regional Fisheries Management Organisations	<i>Areas closed to fishery for VMEs</i> by NAFO NEAFC SEAFO SIOFA CCAMLR GFCM NPFC 14 <i>Benthic Protected Areas</i> by SIOFA	Conservation and Management Measures and Recommendations by each regional fishery organizations. Technical report XVII 16/02	(a) Adopt measures for bottom fishing according to UN General Assembly Resolutions on the protection of vulnerable marine ecosystems, based on the best available scientific information. (b) Follow the FAO Code of Conduct for Responsible Fisheries and any other internationally agreed

(Continued)

TABLE 1 Continued

Agreement	ABMTs/MPAs	Decision	Criteria
			standards, as appropriate. (c) Prevent significant adverse impacts of bottom fishing activities on vulnerable marine ecosystems.
United Nations Convention on the Law of the Sea – Part XI	13 Areas of Particular Environmental Interest (Clarion-Clipperton province)	International Seabed Authority Council, <i>Decision of the Council relating to an environmental management plan for the Clarion-Clipperton Zone</i> , 26 July 2012, ISBA/18/C/22; International Seabed Authority Council, <i>Decision of the Council of the International Seabed Authority relating to the review of the environmental management plan for the Clarion-Clipperton Zone</i> , 10 December 2021, ISBA/26/C/58.	(a) “Vulnerable marine ecosystems” as defined by the FAO criteria for deepsea bottom fishing in the high seas; (b) Areas representative of the full range of ecosystems, habitats, communities and species of different biogeographic regions; (c) Areas of sufficient size to protect and ensure the ecological viability and integrity of the features for which they were selected.
United Nations Convention on the Law of the Sea – Part XI	3 Areas in Need of Protection Kane Fracture Zone Vema Fracture Zone Romanche Fracture Zone 11 Sites in Need of Protection 12 Sites in Need of Precaution Areas in Need of Precaution Based on habitat suitability models (MAR province) (to be created by the ISA Council at its next session in 2023)	International Seabed Authority Council, <i>Report of the Chair of the Legal and Technical Commission</i> , 18 March 2022 ISBA/27/C/16 <i>Stakeholder consultation on the draft regional environmental management plan for the Area of the northern Mid-Atlantic Ridge with a focus on polymetallic sulphide deposits</i> 14 April 2022 https://isa.org.jm/news/draft-regional-environmental-management-plan-northern-mid-atlantic-ridge-open-consultation	a) Prevent habitat loss to maintain ecosystem viability; b) Ensure connectivity is maintained amongst populations; c) Maintain representativity of habitats at the regional scale; d) Maintain migratory corridors; e) Maintain feeding and breeding grounds; f) Maintain ecosystem function (both benthic and pelagic); g) Ensure exploitation does not exceed cumulative impacts thresholds.



Even in the framework of the activities in the Area²⁴, the ISA considered the possibility of developing ABMTs to protect the most fragile ecosystems of the ocean regions targeted for mineral exploration and exploitation. Indeed, pursuant to article 145 of the UNCLOS, in 2012 the ISA adopted the first, and so far only, regional environmental management plan (REMP) for the Clarion-Clipperton Fracture Zone²⁵, the mining province where most of the exploration licenses have been issued and where the first exploitation of polymetallic nodules could take place²⁶ (Christiansen et al., 2022).

The REMP identified nine initial marine areas of particular environmental interest (APEIs) where the exploration and exploitation of mineral resources are prohibited for five years with the objective of protecting biodiversity and ecosystem structures and functions associated with mining areas²⁷. The creation of four additional APEIs in the Clarion-Clipperton area was also decided in December 2021²⁸.

24 The International Tribunal for the Law of the Sea has defined activities in the Area in these terms: 'the expression "activities in the Area", in the context of both exploration and exploitation, includes, first of all, the recovery of minerals from the seabed and their lifting to the water surface. Activities directly connected with those mentioned in the previous paragraph such as the evacuation of water from the minerals and the preliminary separation of materials of no commercial interest, including their disposal at sea, are deemed to be covered by the expression "activities in the Area"'. International Tribunal of the Law of the Sea, Seabed Disputes Chamber, Responsibilities and obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, Advisory Opinion, 1 February 2011, I. T. L. O. S. Reports 2011 p.10, paras. 94-95.

25 International Seabed Authority Council, *Decision of the Council relating to an environmental management plan for the Clarion-Clipperton Zone*, 26 July 2012, ISBA/18/C/22.

26 The REMP is a policy document providing the actors involved in the activities in the Area with management tools aimed at supporting informed decision-making which balances resource development with conservation. It also provides a uniform mechanism to identify representative areas that require appropriate levels of protection in compliance with the Sustainable Development Goals. See United Nations General Assembly, *Transforming our world: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1.

27 International Seabed Authority Legal and Technical Commission, *Environmental Management Plan for the Clarion-Clipperton Zone*, 13 July 2011, ISBA/17/LTC/7, para. 39.

28 International Seabed Authority Council, *Decision of the Council of the International Seabed Authority relating to the review of the environmental management plan for the Clarion-Clipperton Zone*, 10 December 2021, ISBA/26/C/58.

As interest in exploration and exploitation of mineral resources has rapidly expanded in other mining areas, the ISA is also convening workshops and collecting data to compile other REMPs and identify APEIs in the Mid-Atlantic Ridge, in the Indian Ocean, as well as in the North-west Pacific and South Atlantic.²⁹

Along with ABMTs, there is no single definition of an MPA too, as many of the several treaties allowing for their creation both within and beyond national jurisdiction provide a different one.

Among the international instruments with a global character aimed at the conservation of biodiversity (Ricard, 2019), the Convention on Biological Diversity (CBD) is the sole treaty providing for a process for the designation of possible MPAs in ABNJ, through the decisions of its Conference of the Parties (CoP).

Article 2 of the CBD reflects a widely accepted definition of protected area that could well be adapted to MPAs. It is considered 'a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives'³⁰. At the core of this definition lies that MPAs enjoy special protection vis-à-vis the surrounding areas, as a result of the more stringent regulation of human activities taking place therein (Molenaar and Oude Elferink, 2002).

In the context of this designation effort, in 2008 its CoP also adopted seven scientific criteria for the identification of ecologically or biologically significant areas (EBSAs) also in the high seas and in the Area, i.e. ocean areas of recognized importance in terms of their ecological and biological characteristics for the ecosystem services they provide to humans³¹.

To date, more than 270 areas within and beyond national jurisdiction have been identified as EBSAs (Oral, 2020). However, the growing number of selected EBSAs does not amount to the establishment of as many MPAs in ABNJ (Druel, 2012; Warner, 2017). The States Parties to the CBD have, in fact, stressed that the designation of an EBSA by the CoP is 'a scientific and technical exercise' from which no legal obligation, in terms of their establishment and management, arises³². In order for EBSAs in ABNJ to become proper tools for the protection of the marine

29 International Seabed Authority Council, *Statement by the President of the Council on the work of the Council during the first part of the twenty-fourth session*, 13 March 2018, ISBA/24/C/8, para. 9.

30 Convention on Biological Diversity, concluded on 5 June 1992, entered into force on 29 December 1993, 1760 U. N. T.S. 79 [CBD], Article 2.

31 Convention on Biological Diversity, Conference of the Parties, *Marine and Coastal Biodiversity*, 9 October 2008, UNEP/CBD/COP/DEC/IX/20.

32 Convention on Biological Diversity, Conference of the Parties, *Marine and coastal biodiversity: ecologically or biologically significant marine areas*, 5 December 2012, UNEP/CBD/COP/DEC/XI/17, Annex, para. 7.

environment, it would be necessary for them to be associated with a binding conservation and management measure, which is the essence of any effective MPA³³.

In the CBD framework, MPAs are deemed to be the most effective conservation tool (Heffernan, 2018) to the extent that they offer a degree of long-term *in situ* conservation of entire ecosystems against multiple stressors in specific areas of the ocean. In particular, there is some scientific agreement that large, long-term, no-take, well enforced networks of MPAs can help protect, recover and maintain fish stocks, ecosystem resilience and habitat structure, thus providing greater ecologic and socio-economic benefits (Edgard, 2014).

4 Case studies

The two case studies presented in this paper intend to disclose some of the risks associated, in the long term, with the lack of a clear governance regarding both legal and geomorphological aspects in ABNJ, as described in the previous paragraphs. In particular, the main issues hampering an effective protection of marine ABNJ are: 1) the almost total lack of regulation of human activities in the water column against the specific legal regime for the seabed and the subsoil; 2) the fragmentation of legal regimes applicable to both domains; and, finally, 3) the difficulty of cooperation among the regional, sectoral or even universal legal frameworks involved in the governance of marine ABNJ.

In this context, when addressing the need of protecting the high seas ecosystem as a whole, the analysis of the competences and the powers of the ISA and the relevance of the regional or sectoral organizations or treaties competent in each marine space are crucial.

4.1 Lost City

The first case study focuses on an area of the Mid-Atlantic Ridge, informally known as Lost City which is completely located in ABNJ at 800 m water depth (Figures 1A, B).

The Lost City hydrothermal field is formed by actively venting relatively cool (40–75°C) carbonate chimneys that tower 60 m above the surrounding seafloor making them distinctly different from mid-ocean-ridge hot (200–400°C) sulphide hydrothermal vents, popularly known as ‘black

smokers’. The Lost City pinnacles vent alkaline fluids, rich in hydrogen and methane, and support dense microbial communities that include peridotite-hosted anaerobic thermophiles, which have been thriving life for at least the last 40,000 years (Ludwig et al., 2006). It was discovered in December 2000 during a research cruise with camera-assisted submersible dives (Kelley et al., 2001). Thereafter, several MSR expeditions, including by International Ocean Discovery Program (IODP) Expeditions (Früh-Green et al., 2018), have been prodromal for the acquisition of data on the uniqueness, relevance to the history of life on Earth, vulnerability, productivity, and biological diversity of the site, that are required under the CBD for a site to qualify as an EBSA (Figure 1B). Because of the features of this unique biotope, in 2014 the CBD highly ranked Lost City against most of these EBSA criteria³⁴ and its CoP adopted a decision recognizing that it may require enhanced conservation and management measures³⁵.

Despite the outstanding biological and geological relevance of the site, in August 2017, the ISA executive organ, the Council, - based on the recommendation of its subsidiary organ, the Legal and Technical Commission (LTC)- approved the application for a plan of work for exploration for polymetallic sulphides, submitted by the Ministry of the Environment of Poland³⁶, covering an area comprising Lost City.

Following this approval, Poland entered into a 15-years contract with the ISA for exploration, starting from 12 February 2018. The LTC recommendation, and the Council decision, did not acknowledge the previous inclusion of Lost City in the EBSA list, and did not either recognize that this particularly vulnerable and fragile site, identified through the same scientific criteria used for the selection of APEIs, deserves protection.³⁷ Indeed, the LTC only pointed out that no MPA had officially been designated in the contract area yet.

34 Convention on Biological Diversity, *Expert Workshop to Develop Options for Modifying the Description of Ecologically or Biologically Significant Marine Areas, for Describing New Areas, and for Strengthening the Scientific Credibility and Transparency of This Process*, 27 November 2017, CBD/EBSA/EM/2017/1/INF/1, p. 26.

35 Convention on Biological Diversity, Conference of the Parties, Marine and Coastal Biodiversity: Ecologically or Biologically Significant Areas (EBSAs), 17 October 2014, UNEP/CBD/COP/DEC/XII/722.

36 International Seabed Authority, Decision of the Council of the International Seabed Authority relating to an application by the Government of Poland for approval of a plan of work for exploration for polymetallic sulphides, 10 August 2017, ISBA/23/C/14.

37 International Seabed Authority Council, *Decision of the Council relating to an environmental management plan for the Clarion-Clipperton Zone*, 26 July 2012, ISBA/18/C/22.

33 Convention on Biological Diversity, *Expert Workshop to Develop Options for Modifying the Description of Ecologically or Biologically Significant Marine Areas, for Describing New Areas, and for Strengthening the Scientific Credibility and Transparency of This Process*, 27 November 2017, CBD/EBSA/EM/2017/1/INF/1, p. 14 and 30.

Only recently, the ISA, in drafting a REMP for the northern Mid-Atlantic Ridge, provided for specific management measures addressed to sites in need of protection where VMEs have been identified.³⁸ In principle, Lost City falls in this category but, with the aim of guaranteeing the security of contract tenure provided by the UNCLOS, any management and conservation measure determined under the drafted REMP will only apply to exploitation activities. In other terms, no limitation to exploration activities is foreseen, entailing the complete lack of protection of Lost City and associated VMEs in the exploration phase.

This case study offers food for thoughts from both the scientific and legal perspectives.

Firstly, it is highly controversial to what extent ISA has effectively protected vulnerable areas. Indeed, as certain types of exploration activities could result in harm to the marine environment, and considering that Lost City had been already included in the EBSA list, it appears almost unexpected that no precautionary measure had been adopted or recommended by ISA in the relevant area. This would be mandated under Regulation 33.4 on prospecting and exploration for polymetallic sulphides in the Area, which expressly entrusts the LTC to determine appropriate management measures to protect VMEs from harmful effects caused by any activity regulated by the Authority in the Area, in compliance with the precautionary approach.³⁹

The mentioned legal constraints had not necessarily implied the rejection of a plan of work for exploration, but at least the adoption of some amendments to its geographical scope to avoid impinging on Lost City. In this perspective, the case under review offers a lesson to be learned for future activities in the Area - including exploration - as it illustrates the need to include a specific provision preventing the approval of licenses in areas already identified by other competent organizations as deserving specific protection in the ISA regulatory framework.

Another relevant issue to take into consideration regards the interplay between the MSR regime and the rights granted to contractors in the areas under license with the ISA. The topic has recently attracted attention as the IODP expedition at Lost City in 2023 is fast approaching⁴⁰ (see [Figure 1B](#)).

The crucial question concerns whether any State or private entity can carry out MSR in an area already under exploration or exploitation license with the ISA. If so, it is to be ascertained what kind of MSR activities can be conducted so as not to interfere with the contractors' exercise of rights and the obligations.

Guidance in this respect is provided by article 147.1 and 147.3 of the UNCLOS. The former requires that contractors carry out their activities in the Area with reasonable regard for other activities in the marine environment, while the latter establishes that other activities in the marine environment shall be conducted with reasonable regard for exploration and exploitation in the Area.

The reciprocity clause contained in article 147 suggests that the contractors' rights do not necessarily prevail on the freedom of MSR in the Area. The balance between the two different legitimate interests shall be struck on a case-by-case basis ([Vöneky and Beck, 2017](#)).

The ISA has an important role to play in this respect. In fact, in the light of the powers attributed to the Authority, both in the conclusion of exploration and exploitation contracts and in conducting and coordinating MSR, it is best placed to ensure that all the rights and obligations are properly balanced.

The interplay between MSR and exploration contracts also stands out with respect to the protection of the marine environment. From this point of view, it is to be underlined that different standards for the protection of the marine environment are applicable to certain activities when carried out under an exploration contract or as a form of MSR. In particular, under the Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area (the Recommendations) issued by the LTC⁴¹, that contractors are required 'to observe as far as reasonably practicable'⁴², there are certain exploration activities which require a prior EIA. Instead, when conducted by researchers, the very same activities do not need to comply with such strict requirements and do not need prior authorization by the ISA. It is evident that, on the one hand, this produces an advantage for the latter, which can carry out their activities without additional

38 International Seabed Authority Council, Regional Environmental Management Plan for the Area of the northern Mid Atlantic Ridge (MAR) with a focus on polymetallic sulphides, 17 August 2022, ISBA/27/C/38.

39 International Seabed Authority Assembly, *Decision of the Assembly of the International Seabed Authority relating to the regulations on prospecting and exploration for polymetallic sulphides in the Area*, 15 November 2010, ISBA/16/A/12/Rev.1, regulation 33 (4)

40 Building Blocks of Life, Atlantis Massif International Ocean Discovery Program Expedition 399. Available at: http://iodp.tamu.edu/scienceops/expeditions/atlantis_massif_blocks_of_life.html

41 International Seabed Authority Council, Legal and Technical Commission, *Recommendations for the guidance of the contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area*, 30 March 2020, ISBA/25/LTC/6/Rev.1.

42 International Seabed Authority Assembly, *Decision of the Assembly of the International Seabed Authority relating to the regulations on prospecting and exploration for polymetallic sulphides in the Area*, 15 November 2010, ISBA/16/A/12/Rev.1, Annex IV, standard clause 13.2 (e)

burdens, but on the other it can jeopardise the protection of the Area, the ISA is called to ensure.

Even though the ISA has no general explicit competence in regulating MSR in the Area under the UNCLOS, the case under review confirms that the ISA has a central role in this respect when coordinating different and overlapping activities, including MSR.

An additional point to consider relates to the collection of baselines data, a contractual obligation for operators (Madureira et al., 2016). According to the Recommendations, throughout their activities contractors are required to collect environmental data⁴³ and to evaluate the genetic connectivity among the species found in the area⁴⁴.

In particular, during an exploration contract for polymetallic sulphides near active hydrothermal vents, like Lost City, a contractor should collect, through precision techniques and remotely piloted vehicles, a statistically significant number of samples of microorganisms⁴⁵. They should then be subject to genetic sequencing and, when possible, cultivation to enable the identification of new species⁴⁶.

These procedures resemble, at least in some of their parts, the bioprospection activities that the BBNJ agreement is now in the process of regulating and for which a benefit sharing mechanism is also under development (Rovere, 2018).

Contrary to what currently envisaged under the last version of the BBNJ agreement,⁴⁷ if the collection of this genetic material takes place in the context of mineral exploration, the information obtained through these techniques would not be included in the *ad hoc* benefit-sharing mechanism, but they would be part of the DeepData database of the ISA, accessible by the international community and aimed to increasingly collect more precise environmental protection measures by the organization⁴⁸.

43 International Seabed Authority Council, Legal and Technical Commission, *Recommendations for the guidance of the contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area*, 30 March 2020, ISBA/25/LTC/6/Rev.1, para 15 (d) (iii)

44 Ibidem, para 15 (d) (vii)

45 Ibidem, para 15 (d) (ii)

46 Ibidem, para 48.

47 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, Further 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, 1 June 2022, UN. doc. A/CONF.232/2022/5.

It should be however pointed out that the environmental data made publicly available by operators, including those related to living marine resources, is quite variable and sometimes very limited, despite this being a specific obligation under exploration contract⁴⁹.

The poor quality and quantity of environmental data disclosed by contractors is often, and even recently, discussed and complained by the Council during the analysis of exploration annual reports⁵⁰. Despite this, the ISA never adopted sanctioning measures to induce contractors to comply with their obligations in the collection of baseline data.

This limited exercise of enforcement powers by the ISA could well result in operators interested in the MGR of a certain area, rather than in the exploration activities, to conclude an exploration contract with the Authority in order to carry out legally, but outside the framework of the BBNJ agreement, bioprospection activities. This would favor the collection of information that, only incidental to the exploration activity, are instead significant for commercial developments related to MGR and which would escape the benefit sharing mechanism currently under discussion in the BBNJ agreement (Morgera, 2018).

4.2 The South-West Indian Ridge

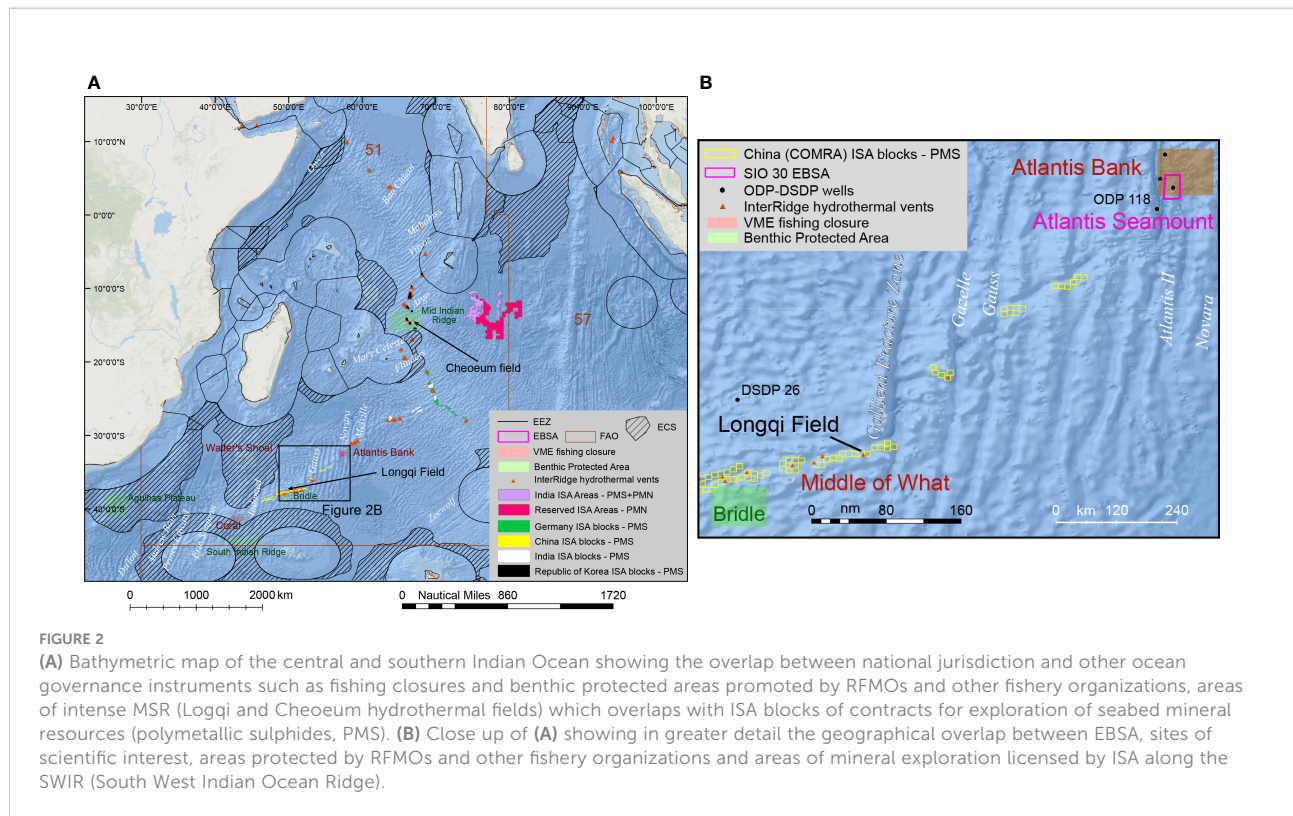
The second case study focuses on the South-West Indian Ridge (SWIR), that, in the last decades, has gained increasing strategic interest since it accommodates several anthropogenic activities, from maritime transportation to fishing, and more recently the exploration and future exploitation of polymetallic sulphides.

The existence of hydrothermal venting along the ultraslow and oblique spreading SWIR was confirmed in 1997, when four active and inactive vent sites were discovered at the Longqi vent field in 2800 m water depth (Tao et al., 2012; Figure 2A). The SWIR is of paramount importance because it is the only known route for migration of chemosynthetic deep-sea vent fauna between the Atlantic, Indian and Pacific Ocean (Copley et al., 2016). However, the understanding of vent population connectivity in the Indian Ocean is hampered by the lack of

48 The database is available at <https://data.isa.org/jm/isa/map/>

49 International Seabed Authority Council, Decision of the Council of the International Seabed Authority relating to amendments to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area and Related Matters, 22 July 2013, ISBA/19/C/17, Annex II, Section V.

50 International Seabed Authority Council, Statement by the President of the Council on the work of the Council during the second part of the twenty-seventh session Addendum, 1 August 2022, ISBA/27/C/21/Add.1, para. 36.



large-scale surveys of the seafloor with the few existing data collected through ISA mineral exploration contracts (Perez et al., 2021) (Figure 2A). Due to intense human activities in the area, newly discovered species in the Longqi field, like the scaly-foot snail *Chrysomallon squamiferum* (Chen et al., 2015), has already been listed as endangered under criteria B2ab(iii) of the IUCN Red List in 2018 (Sigwart et al., 2019).

Against the growing economic interest in bottom fishing and in pursuance of the recalled UNGA resolution on the protection of VMEs in this wide ABNJ, few initiatives for its protection have been adopted only within the framework of the CBD and of some competent RFMOs.

In 2012, the CBD COP identified several EBSAs in the region⁵¹, including the Atlantis Bank (Figures 2A, B), whose relevance depends on uniqueness or rarity, on the presence of pelagic armorhead and sensitivity to bottom trawling⁵². The latter method is widely used for deep-sea fisheries in the region, and it is intensively carried out in the proximity of seamounts - that represent hot spots for many marine species - with

deleterious consequences for both the preservation of the deep-sea features and the conservation of target and associated species (Clark et al., 2019; Van Der Griet, 2021).

In this context, already in 2006, some fisheries companies active in the area since 2000, aware of the damages produced by bottom trawling on fragile ecosystems, constituted the Southern Indian Ocean Deepsea Fishers Association (SIODFA)⁵³ with the aim to safeguard their long-term sustainable use and conservation. In particular, while they self-limited bottom trawling in some areas of the region, they also took the lead of the process for the creation of the Southern Indian Ocean Fisheries Agreement (SIOFA). Thanks to the spur of SIODFA, this agreement⁵⁴ - covering only ABNJ in the southern Part of Major Fishing Area 51 and 57 (Figure 2A)⁵⁵ - was concluded in 2006, entered into force in 2012 and now counts 10 contracting parties⁵⁶,

⁵³ The SIODFA membership includes Austral Fisheries (Pty) Ltd, Taiyo A&F Co. Ltd, Orafco Ltd and United Fame Investments, all fishing in the area since 2000.

⁵⁴ Southern Indian Ocean Fisheries Agreement, concluded on 7 July 2006, entered into force on 21 June 2012, 2835 UNTS 409. [SIOFA]

⁵⁵ SIOFA, article 3.

⁵⁶ Australia, China, Cook Island, European Union, France, Japan, Korea, Mauritius, Seychelles, Thailand

⁵¹ Convention on Biological Diversity, Conference of the Parties, Marine and Coastal Biodiversity: Ecologically or Biologically Significant Areas (EBSAs), 17 October 2014, UNEP/CBD/COP/DEC/XII/722.

⁵² For these information, consult the clearing house mechanism at <https://chm.cbd.int/database/record?documentID=204015>

one cooperating non contracting party⁵⁷ and a participating fishing entity⁵⁸.

In 2015, the SIODFA, which enjoys an accredited observer status, proposed to the Meeting of the Parties (MoP) of SIOFA the creation of 11 benthic protected areas (BPAs)⁵⁹.

Despite the MoP did not endorse the SIODFA proposal, BPAs have been *de facto* protected by self-limitations endorsed by the fishing companies belonging to the SIODFA.

Interestingly, in 2011, in the proximity of one of those BPAs, known as Bridle, where a voluntary closure to deep-sea bottom fishing by SIODFA was in place⁶⁰, a State-owned entity sponsored by China, the China Ocean Mineral Resource Research and Development Association (COMRA or the Chinese company) obtained a license for the exploration of polymetallic sulphides (Figure 2B). The Bridle BPA, a zone of knolls and ridges in almost pristine condition, previously unmapped and undescribed, partially overlaps with the contract area (Figure 2B).

In the assessment required for the recommendation of the approval of a license with the ISA, the LTC asked COMRA for assurances that the proposed exploration activities provide for the effective protection and preservation of the marine environment and that exploration installations do not cause interference in areas of intense fishing activities.

In answering the requests from the LTC, the Chinese company restated its commitment to protect benthic ecosystems⁶¹, thus complying with relevant UNCLOS provisions and with relevant UNGA, FAO and SIOFA resolutions, nevertheless ignoring the long-lasting practice of protection of VMEs put in place on a voluntary basis by SIODFA.

This second case study confirms some of the issues already dealt with in the previous one and epitomizes some specific aspects deserving further scrutiny. Indeed, even in this region of the Indian Ocean, the poor environmental protection of the seabed beyond national jurisdiction comes into play. In fact, also in this case the granting of an ISA exploration license in an area partially overlapping with a protected area impinges on environmental protection.

As both ISA and SIOFA were unable to adopt measures to safeguard the VMEs of the area, they relied upon the unilateral commitment of private entities to ensure their protection. This aspect is remarkable as it shows how private entities attempt to fill the gaps left by those international organisations, which have the main responsibility to protect the marine environment.

The consequence of such self-limitation is quite paradoxical as it implies a compression of fishing activities in absence of similar restraint for other economic activities which are equally or even more destructive of the marine environment.

Moreover, this case brings again into play the only limited application of the principle of due regard provided by article 147 UNCLOS and of the other provisions of the convention applicable to the high seas as well as the Fish Stock Agreement. Despite SIOFA was created to implement the Fish Stock Agreement in the part it prescribes the creation of RFMOs, no conservation measure for the living resources of the area was adopted by its MoP. By the same token, the COMRA exploration contract was issued by the ISA just few months before the entry into force of SIOFA and of the creation of an EBSA in the area. While, formally speaking, the ISA exploration license was issued in the absence of any SIOFA or CBD conservation measure, from a substantial point of view it was certainly aware of the SIODFA voluntary self-restraint in the contract area, which it should have taken into account.

5 Conclusion

The issues discussed in the previous paragraphs, and in particular the analysis of the two case studies, allow to draw some conclusive remarks.

As shown in the case studies, many human activities are carried out in areas beyond national jurisdiction and they often overlap each other, resulting in a number of conflicts of use and threats to the marine environment. In this context, several factors hindering the establishment and effectiveness of ABMTs and MPAs that are tools for the protection of the marine environment and its biodiversity have been highlighted. Two of them are particularly relevant. On the one hand, the non-universal application of the treaties that allow for the establishment of ABMTs in the areas under analysis which are only binding upon their parties. On the other hand, the non-cross-sectoral nature of the protection and conservation measures adopted under these treaties.

A concrete example of cooperation trying to overcome the latter issue, despite only on a regional and sectoral basis, relates to the Collective arrangement between the OSPAR Commission and the NEAFC⁶². Its main objective is to promote the exchange of information on the activities of each organization and on the adopted conservation and management measures, with the aim

57 Comoros

58 Chinese Taipei

59 Southern Indian Ocean Fisheries Agreement Scientific Committee, Southern Indian Ocean Deepsea Fishers Association (SIODFA) Benthic Protected Areas in the Southern Indian Ocean, February 2016, SC-01-INFO-15.

60 By way of example, on a voluntary basis, Japan prohibited its vessels to fish in those BPA recognised by SIODFA as deserving protection

61 International Seabed Authority Council, Report and Recommendation to the Council of the International Seabed Authority relating to an application for approval of a plan of work for exploration for polymetallic sulphides by the China Ocean Mineral Resources Research and Development Association, 8 July 2011, ISBA/17/C/11, para. 29.

62 The text of the Agreement is available at ospar.org/documents?v=33030 [Accessed on October 12, 2022]

of coordinating the ABMTs and promoting the protection of ABNJ of the North-East Atlantic (Figure 1A). Initial contacts between OSPAR, NEAFC and the ISA started in 2008 and mainly related to the proposed creation of the Charlie Gibbs MPA in an area beyond national jurisdiction of the North-East Atlantic Ocean (Figure 1A). As the only organization having a mandate on the exploration and exploitation activities of the Area and on the protection of the marine environment from their harmful effects, the States Parties to OSPAR advanced to the ISA a proposal for a collective agreement. However, in 2015 some ISA Council members considered it premature to proceed towards a formal coordination with other international organizations and opposed to the conclusion of the agreement. Contrary to the original expectation to involve all the international organizations with a mandate in ABNJ in the region, the Collective agreement was only concluded between OSPAR and NEAFC. Despite this, since their first joint meeting in 2015, the ISA has participated to the work as an observer, highlighting the recognized relevance of a joint action for the protection of marine ecosystems.

The Collective arrangement is just an example to highlight the desirability of promoting cooperation among organizations and conventional regimes on a regular and even permanent basis. In this scenario, a more structured system of cooperation among States and international organizations is crucial as it would allow for the identification of the most appropriate tools for the protection and preservation of a certain geographical area from the cumulative impacts of human activities at sea. A globally accepted system to create universal ABMTs including cross-sectoral MPAs that extends, at the same time, to the high seas and the Area and that relates to the numerous human activities that may take place in the same areas, is highly desirable to counter the existing piecemeal approach. This can be achieved through the ongoing negotiation process for the BBNJ agreement, provided that it will be given sufficient room to allow for coordination between the existing specialized organizations and frameworks and for the creation of new ABMTs and MPAs by its CoP.

Finally, this research has highlighted the relevance of ISA to proactively exercise in the Area powers and functions in the field of protection of the marine environment and coordination among different human activities taking place in ABNJ, including MSR. This is an important element to take into account when considering the role that the ISA could play in the framework of the new BBNJ agreement, with respect to some of its parts, like those concerned with MGR and the creation of cross-sectoral ABMTs.

Data availability statement

The dataset generated and analyzed for this study is derived from the integration of several sources and databases including:

EEZ: Flanders Marine Institute (2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Accessed online on August 2022: <https://www.marineregions.org/>. <https://doi.org/10.14284/386> ECS claimed by States: UNEP Grid-Arendal. Accessed online on August 2022: <http://continentalshef.org/onestopdatashop/6350.aspx>. FAO Fishing Areas. Accessed online on August 2022: https://data.apps.fao.org/map/catalog/static/search?any=FAO_AREAS_CWP&fast=index. Underwater features names: the GEBCO Gazetteer of undersea feature names. Accessed online on August 2022: <https://www.ngdc.noaa.gov/gazetteer/>. Hydrothermal vents: InterRidge Vents Database ver. 3.4. Accessed online on August 2022: <https://vents-data.interridge.org/>. MPA: UNEP-WCMC and IUCN (2021), Protected Planet: The World Database on Protected Areas (WDPA) and World Database on Other Effective Area-based Conservation Measures (WD-OECM). Accessed online on August 2022: <https://www.protectedplanet.net/en/thematic-areas/marine-protected-areas>. OSPAR MPA: Marine Protected Areas (OSPAR) Global view. Accessed online on August 2022: <https://carto.mpa.ospar.org/fr/1/ospar.map> and OSPAR 21/13/1, Annex 23 on the establishment of the North Atlantic Current and Evlanov Sea basin Marine Protected Area. Accessed online on August 2022: <https://www.ospar.org/documents?v=46308>. EBSA: Convention on Biological Diversity, CHM version 2022.25.0. Accessed online on August 2022: <https://chm.cbd.int/database/record?documentID=204107>. <https://chm.cbd.int/database/record?documentID=200105>. <https://chm.cbd.int/database/record?documentID=204068>. <https://chm.cbd.int/database/record?documentID=204106>. IODP: drilled holes. Accessed online on August 2022: <https://www.iodp.org/resources/maps-and-kml-tools>. VME NEAFC: Fishing closures. Recommendation 10:2021 to amend Recommendation 19:2014 on the Protection of Vulnerable Marine Ecosystems in the NEAFC Regulatory Area, as amended. Accessed online on August 2022: <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC201787/>. VME and Benthic Protected Areas SIOFA/SIODFA: CMM 2020/01 Conservation and Management Measure for the Interim Management of Bottom Fishing in the Agreement Area (Interim Management of Bottom Fishing). Accessed online on August 2022: https://www.apsoi.org/sites/default/files/documents/cmm/CMM%202020_01%20Interim%20Bottom%20Fishing%20Measures_0.pdf. VME NAFO: Fishing closures. Northwest Atlantic Fisheries Organization Conservation and Enforcement Measures 2020. <https://www.nafo.int/Data/GIS#>. Accessible as online visualization map at: <http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html>. ISA exploration contract areas: PMN and PMS shapefiles. Accessed online on August 2022: <https://www.isa.org.jm/minerals/maps>. ISA protection measures (AINP, SINP): Draft REMP for the area of the northern Mid-Atlantic Ridge with a focus on polymetallic sulphide deposits. Accessed online on August 2022: <https://isa.org.jm/news/draft-regional-environmental-management-plan-northern-mid-atlantic-ridge-open-consultation>.

Author contributions

All the authors equally contributed to writing, reviewing and editing of the manuscript. MR conceived, planned and realized the figures and the table and their captions. GAR conceived and realized the table. All authors contributed to the article and approved the submitted version.

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