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OECMs in marine capture fisheries: Key implementation issues of governance, management, and biodiversity

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The 'Other Effective Area-based Conservation Measure' (OECM) concept was first introduced in 2010, by the Conference of the Parties of the Convention on Biological Diversity (CBD COP) in the CBD Strategic Plan for Biodiversity conservation 2011–2020. The concept acknowledged that a range of spatial measures other than protected areas were appropriate for reaching Aichi Target 11 spatial conservation coverage. The OECM definition was adopted in 2018 in CBD COP Decision 14/8, which calls on States to mainstream OECMs into economic sectors, to recognize the current biodiversity conservation benefits and co-benefits from their area-based management measures and enhance them as much as possible. In the marine capture fisheries sector, the identification of OECMs is a work in progress and the issues addressed in this paper are key implementation issues that States and fisheries authorities are or will be encountering regarding their governance, management, and biodiversity outcomes. The purpose of the paper is to draw attention to some key OECM implementation issues arising in marine capture fisheries and to suggest possible approaches to address them. The governance issues addressed relate to enabling frameworks, industrial fisheries, legitimate authorities, long-term commitments, cross-sectoral coordination and planning, and contribution to the Post-2020 Global Biodiversity Framework of the CBD. The management issues considered relate to effectiveness in achieving expected outcomes, costs and benefits of OECMs, spatial relations between OECMs and fisheries, and the role of OECMs in the Ecosystem Approach to Fisheries (EAF). Regarding the significant positive biodiversity outcomes expected from OECMs, issues relate to the type of outcomes expected, their current or intended nature, the level of evidence required, and their relationship to area-based conservation standards.

KEYWORDS

OECM, governance, biodiversity, RFMO, conservation area, area-based management tool (ABMT)

Introduction

The concept of 'Other Effective Area-based Conservation Measure' (OECM[1]) was introduced for the first time in the Aichi Biodiversity Target 11 of the Convention on the Biological Diversity (CBD) Strategic Plan for Biological Diversity 2011–2020 in relation to area-based conservation. The Target stated: "*by 2020, at least…10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider … seascapes*"[2]. The Target indicated key properties required for both protected areas and OECMs to be considered in the global area-based conservation coverage. To date, this formulation has been practically retained *verbatim* in Target 3 of the draft Post-2020 Global Biodiversity Framework, ensuring coherence and continuity in conservation efforts.

The CBD Parties identified these properties against a background of growing concerns expressed over threats to a degrading biodiversity (including from climate change); variable effectiveness of existing protected area and lack of systematic performance assessment; sluggish mainstreaming of biodiversity concerns in economic sectors, including fisheries; failure to achieve global conservation coverage targets; the lack of instruments or reluctance of many communities to establish marine protected areas (MPAs), and particularly no-take areas; slow development and gaps in spatial conservation; and lack of accounting of conservation achieved outside MPAs (Lopoukhine and Ferreira de Souza Dias, 2012:2; Visconti et al., 2019; Visconti et al., 2015; Hilborn and Sinclair, 2021).

In 2018, following a 4-year process of scientific and technical meetings and political negotiations, the CBD COP Decision 14/8 defined OECM as "*a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity*[3]*, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio–economic, and other locally relevant values*". An OECM is therefore both an "area" (as indicated in the definition) and a "conservation measure" (as explicit in its full name), within which distinct regulations apply. In this paper, we use the term OECM to refer to both the area and the controls applying within its boundaries, unless specified differently in the text. The positive outcomes of a fishery-OECM occurs inside the OECM boundary but also in the fishery and ecosystem within which it operates.

The definition inherits some fundamental properties of conservation areas specified in Target 11—such as positive biodiversity outcomes and effective management—and adds the need to demonstrate sustained governance and management systems and long-term positive outcomes. CBD Decision 14/8 gives a strong legal foundation to the OECM concept that extends beyond the CBD Strategic Plan for Biological Diversity 2011–2020[4]. Moreover, Decision 14/8 calls on States to mainstream OECMs in all relevant sectors, including through the use of either existing or new areas that would meet the OECM criteria. As such, OECMs are not a new category of spatial measures (see examples in Rice et al., 2022) but rather a specific international label, given to existing or new area-based sectoral or conservation measures that have in common that they are consistent with the required OECM properties. When identified as OECM, such measures maintain their original nature and objectives but benefit from an international recognition of the biodiversity benefits they are out in place to generate.

In addition to the OECM definition, Decision 14/8 outlined four Identification Criteria (A to D) regarding (A) the legal status of the area; (B) geolocalization, governance, and management; (C) effective and sustained contribution to biodiversity conservation, information, and monitoring; and (D) ecosystem services and other locally relevant values (see Himes-Cornell et al., 2022 for details). In addition, Decision 14/8 also provides voluntary guidance on equitable governance of OECMs and their integration in broader conservation networks and across sectors. Fairly similar criteria were adopted by IUCN for Green-listed MPAs (IUCN-WCPA, 2017). Additional elements of guidance and interpretation are available in IUCN-WCPA (2019) and, specifically for marine capture fisheries, in Rice et al. (2018) and (Garcia et al., 2020; Garcia et al., 2019). Regional, national, local, or sectoral level actions to implement OECMs may encounter additional challenges as the agreed definition, principles, criteria, and guidance elaborated at global-level "hit the water", suggesting there may be opportunities to improve the global framework as experience grows.

The formal identification of marine OECMs first began in Canada (CCFAM, 2017; Hiltz et al., 2018; Aften and Fuller, 2019) and is progressively being considered for fisheries management in more and more jurisdictions (Jorgensen et al., 2020; ICES, 2021; Shackell et al., 2021). The implications of OECMs for marine capture fisheries have been considered by various expert meetings, including one organized by CBD

1 We use "OECMs" (plural) when referring to all OECMs or to the category and OECM (singular) when referring to a single site.

2 https://www.cbd.int/sp/targets/

3 *As defined by Article 2 of the Convention on Biological Diversity and in line with the provisions of the Convention.*

4 For example, in Target 3 of the Post-2020 Global Biodiversity Framework.

(2018), the Food and Agriculture Organization (FAO), CBD and the IUCN Fisheries Expert Group (FEG) (FAO, 2019), and the International Council for the Exploration of the Sea (ICES) and FEG in 2020 (ICES, 2021). During these meetings, elements of guidance have been tested on real-world situations and progressively clarified for the application of the OECM definition, criteria, and voluntary guidance to the marine capture fisheries sector (FAO, 2019; Garcia et al., 2019; Garcia et al., 2020 and ICES, 2021). Experience is showing that often with little change to fully meet the criteria, OECMs of relevance to fisheries might either be conventional area-based fisheries management measures (ABFMs or fishery closures)[5] or traditional or modern multi-objective community-based management areas within which fisheries operate. This article focuses on the first type which we refer to as "fishery-OECMs" for convenience.

In this evolving context, this paper addresses some selected implementation issues encountered in the identification and use of OECMs in marine capture fisheries. These issues are grouped into three sections on (i) governance, including high-level policy and legal issues at national and sectoral levels, and on which all depends; (ii) management, covering a number of operational questions such as effectiveness, costs and benefits, spatial dimensions of OECM management, and the role of OECMs in the ecosystem approach to fisheries (EAF; FAO, 2003); and (iii) the past and expected biodiversity outcomes, their types, actual or intended nature, the level of evidence required, and the relation with area-based conservation standards. For each issue, we will refer briefly to the related part of the CBD Decision; the relevant elements in the fishery policy and management frameworks; and the specific actions or options available to address it.

Governance issues

Many issues need to be addressed by governance authorities to facilitate the process of identification and use of OECMs in the marine capture fisheries sector, relating to enabling frameworks, industrial fisheries, legitimate authority, long-term nature of the commitment, cross-sectoral coordination and planning, and contribution to the Post-2020 Global Biodiversity Framework (GBF).

Enabling frameworks

The quality and performance of fishery-OECM governance will depend on the existence of an appropriate overarching enabling framework allowing the fishery sector to act effectively. At the global level, CBD Decision 14/8 established the international framework enabling the identification and implementation of OECMs in all ecosystems and economic sectors, referring briefly to the policy and finance enabling frameworks (p. 5) and enabling conditions (p. 8) needed to mainstream biodiversity conservation in economic sectors and improve equity. With regard to the oceans, the OECM guidance complements the overarching legal and policy frameworks provided by the 1982 United Nations Convention on the Law of the Sea (UNCLOS), the 1992 CBD, and the 1995 United Nations Fish Stocks Agreement (UNFSA).

At the regional level, there already exist international arrangements to manage transboundary and high seas resources, including through ABFMs, in line with the UNFSA. In some cases, minimal updates of the arrangements may be needed to identify and manage OECMs and the specific *biodiversity attributes*[6] concerned. All regional fishery bodies (RFBs) and Regional Fisheries Management Organizations (RFMOs) have already adopted the EAF in which OECMs have many possible roles, and identified vulnerable marine ecosystems (VMEs)[7] which are good potential OECMs. These regional organizations can therefore be mandated by their State Parties to identify OECMs with little or no need to further update their conventions and management frameworks. However, RFBs and regional seas organizations (RSOs) could benefit from strengthened collaborations to promote effective OECMs in cross-sectoral environments.

At the national level, several governance pathways are available. Some States may prefer to review the overarching national policy, legal, and financial frameworks from the onset to speed up a harmonized OECM implementation process in all sectors. Others may decide to start the process with some pilot initiative(s), e.g., in one or a few promising fisheries, progressively discovering what forms of framework updating might be needed. Some may even take lessons learned from other sectors as potential ways to accelerate progress on OECMs in fisheries. Because of the context specificity and diversity of national jurisdictions, generalizations are inappropriate beyond stressing that many of the mainstreaming actions required in the

5 In Decision 14/8, ABFMs are defined as *formally established, spatially defined fishery management, and/or conservation measures, implemented to achieve one or more intended fishery outcomes. The outcomes of these measures are commonly related to sustainable use of the fishery. However, they can also often include protection of, or reduction of impact on, biodiversity, habitats, or ecosystem structure and function* (CBD, 2018b:15).

6 The term "attributes" is used here in the same sense as in Decision 14/8 to refer to "*communities of rare, threatened or endangered species, representative natural ecosystems, range restricted species, key biodiversity areas, areas providing critical ecosystem functions and services, areas for ecological connectivity*".

7 https://www.fao.org/in-action/vulnerable-marine-ecosystems/en/

fishery sector and described in the next sections would be facilitated if enabled by explicit but adaptive national policy frameworks giving fishery authorities the ability and incentives to engage in rolling out the process within the sector, in partnership with other sectors as appropriate. Regarding fisheries, States, individually, jointly across their respective EEZs, or as members of regional fisheries management organizations (RFMOs) in the high seas, are accustomed to implementing ABFMs, some of which may already meet the OECMs criteria or may be enhanced to do so. However, their identification and use may require updating existing legal, policy, financing, and regulatory frameworks at different levels (Garcia et al., 2019; Garcia et al., 2020; Marnewick et al., 2020: 14). In many States, the environmental authorities have firmly started the process in conservation areas under their jurisdiction, and effective collaboration will be needed to ensure the required mainstreaming in the fishery sector ABFMs.

In the marine capture fisheries sector, effective mainstreaming of OECMs may require some or all of the following enabling factors, depending on the current level of development and capacity of the sector:

- A clear legitimate authority with mandate for sectoral OECMs in both centralized and devolved management systems;
- A review and updating of the fisheries legislation to ensure that OECMs fit within the legal framework;
- A sectoral vision or policy commitment for an inclusive mainstreaming process; (iv) a specific strategy, plan, and timetable for OECM implementation in the whole sector, adopting a comprehensive or incremental approach;
- A review of the fishery sector governance systems, *inter alia* to promote and facilitate the identification of additional stakeholders (as may be required by the broader OECM objectives), recognition of their knowledge and values, and effective participation;
- The translation of international guidelines on OECMs into national guidelines, in the formats and local languages required to foster local participation; and
- Special funding mechanisms or other incentives to help start and sustain the OECM process, e.g., for capacity-building in a chronically underfunded sector.

The list is intimidating, but every enabling factor mentioned in it would be useful for any substantive new step in fisheries management, as factors enabling adaptive the whole management and not just OECMs.

An effective collaboration with fisheries stakeholders and conservation authorities has the potential to help build multidisciplinary capacity and mutual trust. Cross-sectoral collaborations to maintain or enhance OECMs may be established bilaterally in some cases but would often benefit from a national enabling framework, such as marine spatial planning (MSP), to ensure that threats to biodiversity by other sectors are addressed collectively by the respective authorities (Decision 14/8, Annex III). Finally, a sectoral audit process under independent oversight would help ensure the effective and transparent contribution of OECMs to national objectives and also strengthen mutual trust between the sector and the authority, among sectors, and with the public.

OECMs in industrial fisheries?

The CBD Decision 14/8 lists the objective requirements to be satisfied by any OECM but does not propose types of conservation areas that should be *a priori* considered OECMs or, conversely, activities or sectors that should *a priori* be considered incompatible with OECMs. Nonetheless, there is a clear reluctance in some conservation quarters to consider industrial extractive activities—including industrial fishing—as compatible with conservation in general and protected areas in particular (Day et al., 2012; Day et al., 2019)[8]. The same reluctance has been expressed by (IUCN-WCPA, 2019: 6) in relation to OECMs which, by definition, are not "protected areas".

To our knowledge, there is no agreed definition for an "industrial fishery". The criteria used to distinguish "artisanal" from "industrial" fisheries vary between countries and socioeconomic contexts (Rousseau et al., 2019). For example, in the literature, the length of vessels considered as industrial is over 7 m in Cape Verde (Knoops, 1995), over 15 m in the South Pacific islands (Gillett, 2007), around 60 m for squid jigging (https://www.fao.org/fishery/fishtech/1114/en), over 100 m for catcher/processer factory trawlers, and over 140 m for the super-giant trawlers (Tracey et al., 2013). In addition, in the European Union, the term is usually associated with vessels used in fish meal and oil (reduction) fisheries. Nonetheless, an industrial fishery[9] would usually involve small or large commercial companies, established for profit, with a large capital investment, using large vessels, and able to stay at sea for a long period of time and travel far away from their base. Capture, preservation, and processing may be integrated on board (factory ships) or through land-based facilities. Artisanal fisheries tend to have the opposite properties within a wide range of technological and other dimensions (Misund et al., 2002; Griffiths et al., 2007).

From a conservation point of view, more industrialized fisheries are considered to be associated with higher extraction rates, persistent and sequential overfishing[10], and stronger environmental impact, particularly on the bottom and in

8 Between the 2012 and 2019 versions of these MPA guidelines, the reference to industrial activities has increased eight times (from 3 to 25).

terms of bycatch. The reality is that the situation varies greatly among fisheries and regions and generalizations may often be unfair and inappropriate. It is obvious that destructive fishing practices—whether industrial or artisanal—should not be allowed inside OECMs. However, effective OECMs may very well be identified or newly established inside any type of fishery with appropriate protective regulations, enforcement, and monitoring. As a matter of fact, Decision 14/8 suggests to "*identify and prioritize the sectors most responsible for habitat fragmentation, including … fisheries … to engage them in developing strategies for mitigating the impacts on protected areas and protected area networks including OECMs…*" (Annex 1, page 4e). Therefore, the compatibility of different types of fishing activities with an OECM status should be assessed applying the CBD Criteria case by case, in context, using the best evidence available, and keeping in mind the potential environmental risks associated with the fishing activities concerned.

Legitimate authority

Some tensions exist still about who may identify or recognize and report on OECMs. Decision 14/8 stresses the importance of the wide range of governance systems under which OECMs may be identified and used, from centralized or decentralized State-driven governance, to shared governance (e.g., co-management) and community-based governance [as in the case of Indigenous Peoples and Local Communities (IPLCs)]. In Decision 14/8, the term "legitimate authority" is used (notably in Criteria B1) together with the "governance authority" and "management authority" underlining the importance of legitimacy across all levels of governance.

In marine fisheries, the only legitimate authority recognized by current international law is the State or an authority mandated or recognized by the State or established by States, at the international level (e.g., RFMOs) or the national level (e.g., national agencies, IPLC municipalities, and fishery associations). Tensions exist, however, in some countries, between the centralized State's authority and customary rights' holders (cf. Govan et al., 2019; Dominguez and Luoma, 2020), and solutions have usually been negotiated at the national level which provide for varying degrees of recognition of these rights.

Decision 14/8 establishes that the legitimate authority can report identified OECMs and their performance, if they so wish, to the World Conservation Monitoring centre (WCMC) global database (WD-OECM) for global reporting. The Decision, however, also allows reporting of OECM sites by non-State entities where specific conditions are met, but these sites are clearly distinguished from government data in the database (John Tayleur, UNEP-WCMV, personal clarification).

How to "ensure" a long-term commitment to OECMs?

Decision 14/8 requires evidence of a long-term intent to maintain the OECM to ensure the continuation of its expected outcomes without specification about the duration of the commitment. Experts participating in preliminary meetings on OECMs in fisheries (CBD, 2018a; FAO, 2019; ICES, 2021), and familiar with management processes and instruments, stated that in most of the areas they considered, there was enough circumstantial evidence of areas similar to OECMS being established and held in place for long periods of time, across many jurisdictions, to consider that, in most cases, the necessary measures would be in place for the "long term". Nevertheless, they also argued that, to inspire confidence, such a commitment should come from the high-level governance and may be demonstrated by various elements including the historical existence of the ABFM before its identification as OECM; or an explicit expression of the long-term intent of the measure, in legal and/or central policy documents and statements; and by the establishment or existence of a functional monitoring and recurrent evaluation system.

Fishery management is a long-term activity by nature, and maintenance of the resource base has been a prominent concern of sustainable development and sustainable use in responsible fisheries. This concern is explicit in the UN Fish Stocks Agreement, which aims "*to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks through effective implementation of the relevant provisions of the Convention* (Art. 2).

However, fishery measures are flexible and adaptable by design, in order to maintain a dynamic regulatory system, and rapidly adapt in case of poor performance or changing conditions. There is therefore a concern that many fishery measures may be in place over too short of a time period to provide meaningful and sustained biodiversity conservation benefits as shown, for example, by McClanahan et al. (2007). The fact is that ABFMs are generally easier to put in place than MPAs but also much easier to modify or eliminate. Two reviews have found that some ABFMs have been totally eliminated, usually when proven ineffective, but also that they have very rarely been formally assessed for effectiveness and adjusted as needed once established (Rice et al., 2018; Shackell et al., 2021).

9 The "industrial revolution" transformed the world since the 18th century through the development of capitalism, technology, machinery, and communications (Larousse online Dictionary). These elements' factors have boosted industrial fisheries development.

10 The successive overfishing of the world stocks, across time and space.

Nonetheless, the OECM potential "volatility" is seen as potentially threatening its role in long-term conservation of biodiversity. This weakness could be strengthened by explicit provisions in the adaptive management process, to require the maintenance of the OECM status (and properties) when adapting ABFMs to changing conditions.

Even if the risk of removing ABFMs is currently small, it may increase because (i) as OECMs they formally need to be recurrently assessed for performance[11], and (ii) with climate change, both ABFMS and OECMs are likely to require dynamic adjustments (Barange et al., 2018). Short-term and seasonal closures which, *a priori*, might be considered as violating the OECM long-term requirement, might in fact be good potential candidates if repeated in the long-term and have shown to maintain biodiversity benefits (IUCN-WCPA, 2019).

Contribution of OECMs to the CBD post-2020 global biodiversity framework

OECMs and MPAs were considered jointly in Target 11 on area-based conservation coverage, and there seems to be a general agreement by CBD Parties that they will play a similar role in the Post-2020 Global Biodiversity Framework (GBF)[12] under its successor Target 3. The Post-2020 GBF does not have any successor for Target 6 (specific to sustainable fisheries), but fisheries-related OECMs may contribute also to several GBF targets, including Target 5 (on sustainable, legal, and safe use of wild species), Target 9 (on most vulnerable people's nutrition, food security, livelihoods, and customary sustainable use), and possibly several other targets. Consequently, fishery OECMs illustrate the interconnections among the GBF Targets as well as the fact that single initiatives may simultaneously serve many targets. The synergetic action of spatial and non-spatial measures in fisheries, and the partial dependence of OECM's performance on measures applied in and out of the OECM, also illustrates the fact that more than one initiative may be needed to reach one target. From that perspective, OECMs have a unique potential to concretely bridge fisheries and conservation communities of practice. States could be strongly encouraged to consider fishery OECMs as one of the instruments they promote nationally and regionally, in order to more fully reflect—and increase global awareness on—their conservation efforts in the GBF.

11 Although fisheries management requires recurrent assessment of the state of stocks, and more generally of management performance, the recurrent assessment of individual ABFMs is still rare.

12 Still available only in draft when writing this article.

Management issues

An overriding and obvious requirement for OECMs to be effective is that an effective management system is active and a range of systems may exist from highly sophisticated to very traditional. Once duly identified as OECMs, their conservation objectives should be integrated in the fisheries management plan (or any informal version of that instrument) if this was not yet the case. The additional operational aspects specific to the OECM conservation functions will be simpler to address in well-managed ABFMs with good monitoring and assessment systems. A number of issues may emerge anyway in the implementation process, related to management effectiveness, costs, and benefits of OECMs mainstreaming in the sector, spatial dimensions of their management, and the role of EAF.

Management effectiveness

Management effectiveness relates to the extent to which objectives and expected outcomes are reached and maintained. Decision 14/8 recommends that the eventual collateral benefits of an ABFM be identified and reflected in the OECM objectives for future monitoring. In community-based OECMs, objectives may not be very specific, monitoring capacity may be limited, and, therefore, effectiveness may only be approximately and qualitatively assessed (i.e., using local knowledge). Effectiveness is a standard issue in both fisheries management and conservation and a strong requirement for OECMs (CBD Decision 14/8, Criteria C).

As for all ABMTs, OECM effectiveness will depend on the appropriateness of the location; the quality of resource assessments and management advice, the suitability of measures taken inside it; and the rigour of their enforcement. Effectiveness also depends on factors external to the OECM, such as the quality of fishery management[13] around it, the degree of integration of measures taken in and around the OECM, the socioeconomic conditions of the fishery, the current state of the biodiversity attributes of concern, the existence and type of subsidies, and stakeholders' engagement.

Ideally, the management effectiveness of an operational OECM might be measured against its specific stated objectives (CBD, 2018b) in its transitional and final states, and in the long term. This may be done at three levels:

- At site level, inside the OECM area, e.g., regarding amount and quality of positive biodiversity outcomes;
- At fishery level, in relation to the integration of spatial and non-spatial conservation measures within the

13 It has been shown that management effectiveness is strongly related to gross domestic product (GDP) per capita and to total landings,

fishery management plan to coordinate measures taken inside and outside the OECM including for monitoring and enforcement; and
- At network level, across the entire fishery sector, exclusive economic zone (EEZ), regional ecosystem, seascape, and conservation network.

OECMs may be established based on current or expected outcomes (CBD, 2018b), and therefore, effectiveness will measure the extent to which the original outcomes are maintained or augmented, and the expected ones materialize. Improving the probability that the fishery-OECM management will be effective may call for a variety of combinations of the following:

- Elaboration of additional regulations, e.g., to protect fishery OECMs from external negative impacts on biodiversity;
- Updating the EAF framework within which OECMs should be nested;
- Strengthening monitoring and evaluation capacity; and
- Identification of cross-sectoral issues; and (v) mobilization of international collaboration for OECMs straddling beyond national jurisdiction or located in the high seas.

More generally, management effectiveness of fishery OECMs is enhanced when they are nested within EAF. Decision 14/8 states in fact that *management of OECMs is consistent with the ecosystem approach and the precautionary approach, providing the ability to adapt to achieve biodiversity outcomes, including long-term outcomes, inter alia, the ability to manage a new threat*. Thus, identification and use of OECMs would concretely illustrate and possibly reinforce the implementation of the EAF (FAO, 2003) which, in principle, combines sustainable use and protection of biodiversity. In addition, the numerous EAF frameworks now available at national, regional, and global[14] levels and the related capacity-building efforts should greatly facilitate OECM identification and implementation. A substantial part of the information and infrastructure needed may already be available, including historical datasets, collaborations, with biodiversity agencies, and participatory management processes, as demonstrated in the ICES-FEG workshop on the North Atlantic (ICES, 2021).

OECM management effectiveness would be easier assessed if the expected biodiversity achievements were reflected in the primary and secondary objectives of the OECM and the fishery (CBD, 2018b: 13). Given its dual role for sustainability and conservation and its ecological functional relations with the whole fishery, the full (or net) effectiveness of an OECM may only be fully appreciated when the state of the biodiversity attributes of concern is assessed both inside and outside it, accounting for spillover (including production of recruits and propagules) and other interactions, and sometimes even at a distance, if key biodiversity or fishery benefits are for highly migratory species (Garcia et al., 2019; Garcia et al., 2020; Shackell et al., 2021). For factors such as connectivity and representativeness, effectiveness should be measured at the ecosystem and conservation network levels, preferably in collaboration with environmental agencies and other sectors. In particular, if there was a risk that specific biodiversity attributes of concern that were protected in the fishery were significantly impacted by other economic activities, in the OECM or in areas adjacent to it, a cross-sectoral arrangement would be necessary to jointly ensure that the expected outcome and the OECM status were not jeopardized.

Potential problems in measuring fishery OECMs' effectiveness may relate to:

- The required recurrent performance assessments of each individual OECM[15] and the related workload;
- The usual difficulty in reliably establishing the cause–effect relation between a single measure and its outcomes in complex social-ecological systems, (Garcia and Charles, 2007; Ovando et al., 2021); and
- The absence of a specific performance benchmark in Decision 14/8 about the amount of outcome that may be required to satisfy each criterion individually and in aggregate to achieve the "positive", "sustained", and "long-term" requirements of the Decision (cf. also Section 4.3).

In addition to the criteria given in Decision 14/8, and considering the budgetary limitations, effectiveness should also address "cost-effectiveness", e.g., the extent to which the outcomes have been obtained at the lowest possible cost (see below).

Costs and benefits in OECM outcomes?

Costs and benefits of management relate to management efficiency, i.e., the price that has to be paid for the expected benefits. The question is given significant importance in Decision 14/8 in relation to efficiency; assessment and monitoring; allocation and equitable sharing; and eventual compensations. As with any fishery management measure, the

reflecting the importance of the fisheries in the economy and the capacity to invest in an effective management system (Melnychuk et al., 2017).

14 http://www.fao.org/fishery/eaf-net/en; see also FAO (2021)

15 In well-managed fisheries, the recurrent assessment of the overall management performance is common practice but single ABFMs may be assessed only occasionally.

expected or perceived "benefits and "costs" of recognizing or creating an OECM and their equitable distribution among stakeholders and right-holders will influence effectiveness through attractiveness, of the benefits of and willingness for compliance. Some of these costs and benefits to the sector or to biodiversity may not be easily valued, but nevertheless can be important to consider in judging effectiveness (Table 1).

When an ABFM is recognized as an OECM, the occurring biodiversity benefits may simply be recognized, the related costs are already absorbed in current management and fishing operations, and there should be fewer cost/benefit problems. However, if additional measures are needed to enhance the ABFM biodiversity benefits, the related additional cost and its distribution will influence the decision and its outcomes. The question is particularly strategic in Small Islands Developing States (SIDS) and least-developed countries, with limited budgets and monitoring and assessment capacity. In this environment, capacity-building may be required incorporating traditional knowledge and local competences.

Spatial dimensions of OECMs

Area-based management and zoning are essential for EAF and conservation (FAO, 2003; Norse et al., 2005; Young et al., 2007). In this regard, a useful step in designing OECMs would be the delimitation of the historical fisheries footprints[16], clarifying the spatial relationship among fisheries, with other sectors, and among sectoral OECMs, within a broad conservation network. In the marine realm, zoning may, *a priori*, be horizontal or vertical depending on context consistent with Decision 14/8, which stresses the importance of the three-dimensional nature of marine and coastal ecosystems and of OECMs (in Criteria B1). This draws attention to connectivity, spatial integration, and potential overlap of OECMs with existing traditional territories. The implementation issues below, regarding horizontal and vertical zoning of OECMs and their static or dynamic nature, are not addressed explicitly in the Decision but are briefly discussed in IUCN-WCPA (2019) and Garcia et al. (2021).

ABFMs are horizontally delimited areas, on the bottom or at the surface, in which the special measures applied are typically more restrictive than in the surrounding fishing ground[17]. Fishery OECMs are ABFMs that meet the OECM criteria. Most of the issues related to horizontal dimensions of OECMs, e.g., their boundary, size, and location, are addressed in the Decision, similar to those concerning ABFMs or MPAs, and are rarely controversial. However, a few specific points may be noted. Some ABFMs may need spatial improvements to better meet the OECM criteria—for example, (i) adjustment of existing boundaries to better protect key biodiversity attributes; (ii) fusion of neighbouring or overlapping ABFMs to integrate their management and enhance the aggregated OECM performance; and (iii) additional internal zoning to more effectively protect the additional biodiversity attributes of the OECM, to distribute costs and benefits more equitably, or to accommodate cases where the OECM straddles multiple jurisdictions. Such adaptations may increase in the future as climate change continues to move biodiversity across jurisdictional boundaries (Pinsky et al., 2018).

The vertical dimension of an ABFM is practically never explicitly stated, possibly because the extension of the water column to be protected (below a surface ABFM or above a benthic one) is addressed by the gear regulations. The importance of ocean depth is stressed in Decision 14/8, but whether fishery-OECMs should or could be vertically zoned is an unresolved issue. Horizontal zoning of ABFMs and MPAs intends to focus and improve management. For similar reasons, vertical zoning might improve OECM performance. Some sort of vertical zoning is implicitly undertaken when allowing or forbidding pelagic, mesopelagic, or benthic fishing techniques in a given area. Vertical zoning exists also *de jure* over the extended continental shelf where the bottom and the water column are respectively under national and international jurisdiction. However, concerns have been expressed in relation to the potential lack of coherence of regulations across the water column or difficulties of three-dimensional monitoring and enforcement (IUCN-WCPA, 2019: box 2; Garcia et al., 2019: 31). The issue is complicated by the fact that in a dynamic ocean, the ecological connections between the surface and the bottom are not all contained in the vertical water column above the OECM bottom, and a network of OECMs at different places and depths might be more effective. There is also no reason *a priori* why a fishery OECM could not just be pelagic or benthic, demonstrating long-term biodiversity benefits at these levels. It must be stressed that Decision 14/8 requires the achievement of *positive and sustained long-term biodiversity conservation outcomes* but does not call for the protection of " *the full range of native biodiversity" as suggested in* IUCN-WCPA (2019). Therefore, pending better clarity about the intent of the CBD with regard to vertical zoning, the issue is one where the pragmatism and the flexibility provided in Decision 14/8 will be needed, balancing ecological objectives and operational realities as well as fears and opportunities, case by case.

Just as for ABFMs, OECMs' location and boundaries may *a priori* be static or dynamic. The biodiversity elements of concern may be linked to fixed bottom structures and habitats (e.g., seamounts, canyons, deltas, reefs) or to dynamic oceanographic

16 A process sometimes referred to as "ring-fencing" (Augustyn et al., 2018; https://www.sadstia.co.za/sustainability/ring-fence-initiative/)

17 Fishing may also be prohibited in and around aquaculture farms, oil and gas fields, navigation channels, wrecks, telephone cables, etc., but these measures are not ABFMs and are not considered in this paper.

TABLE 1 Potential benefits and costs of OECMs.

OECM potential benefits	OECM potential costs
Further assess, describe, and enhance current ABFM biodiversity conservation co-benefits	Added management complexity and related costs in monitoring, assessment, and enforcement
Further reduce or mitigate fisheries collateral impact on non-target species and habitats	Additional costs to the sector if some existing fishing practices are excluded or displaced
Incentive for better consideration of biodiversity outcomes in ABFM design	Raising interaction costs as the range of stakeholders increase with broader objectives
Improved connectivity of regional conservation networks of conservation measures	Risk for the sector to tarnish its image if it fails to achieve or demonstrate expected outcomes
Strengthening of EAF implementation, facilitating, eco-labelling and related potential market benefits	Less cooperation of some fishery participants if their harvest-related objectives are being lowered;
Improved likelihood of States meeting the 30% coverage target by 2030	Risk of losing part of the flexibility of fisheries management
Improved image of fisheries with the public, consumers, and civil society	
More constructive collaboration of the conservation constituency with the fisheries managers and sector	
Increased recognition and empowerment of local or shared management systems	

features (e.g., thermoclines, photic zone, upwellings, currents, gyres, and fronts). OECMs may therefore need to be static or dynamic as appropriate. Dynamic OECMs shifts may be either forecast when reliably predictable or determined in quasi real time, using move-on rules (Dunn et al., 2016). Nevertheless, the concept causes concern in parts of the biodiversity conservation community[18]. Potential difficulties include:

- Detectability of changes in the oceanographic features;
- Speed and appropriateness of management responses;
- For existing ABFMs, the fact that the ABFM targets species and the OECM broader biodiversity of concern may not move similarly;
- The applicability of the approach mainly to large-scale fisheries with sophisticated electronics, on-on-board observers, and fast management procedures; and
- The complication of tracking the OECM coverage area for global reporting.

These challenges might be addressed by:

- Not counting mobile ABFMs as OECMs, which would remove some real conservation benefits from global calculations, compromising some of the intent of the global targets;
- Considering as OECM the average area covered by high concentrations of conservation targets, disregarding interannual variations; or
- Enclosing in the OECM the entire area historically covered by the moving conservation targets, accepting to protect areas of low risk for biodiversity, decreasing economic efficiency.

The most effective and/or acceptable solution may only be determined in context. As the issue is likely to be common to many economic sectors, cross-sectoral cooperation may help finding common approaches.

Biodiversity issues

What types of biodiversity outcomes are to be considered?

It is fundamental to understand what biodiversity attributes may be protected in a fishery-OECM. The OECM definition indicates that they are expected "*to achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity…*" (emphasis added). CBD Article 2 defines the latter as "*the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings…*"(emphasis added). Decision 14/8 (Criterion C3) identified particular elements of biodiversity to be protected: e.g., communities of rare, threatened, or endangered species, representative natural ecosystems, range restricted species, key biodiversity areas, areas providing critical ecosystem functions and services, and areas necessary for ecological connectivity. Additional elements suggested by (IUCN-WCPA, 2019: box 4) include spawning and migrating aggregations; habitats important for species life stages, feeding, resting, moulting, and breeding; and food chain structure.

18 Although IUCN-WCPA (2019: box 2) agrees that in exceptional circumstances boundaries may be defined by physical features that move over time, such as riverbanks, the high-water mark, or extent of sea ice.

In the fishery sector, the Code of Conduct for Responsible Fisheries (CCRF; FAO, 1995) and the EAF (FAO, 2003) already include explicitly as objectives:

- Maintenance and recovery of target and non-target species[19], including vulnerable and protected species;
- Protection or recovery of critical, essential, or vulnerable habitats; and
- Maintenance of ecosystem structure (as reflected for example by the food-chain) (Zhou et al., 2019), acknowledging all the properties desirable under the CBD (2018) and IUCN-WCPA (2019)guidance.

Moreover, many of the measures taken, when effectively applied, may also produce other broad and not yet identified biodiversity outcomes, positive or negative and context dependent. Ideally, the full range of outcomes should be identified, and documented for any management measures, and explicitly included in OECM objectives (if positives) or addressed (if negative).

The CCRF and EAF already commit the fishery sector to take action on the elements of biodiversity that are or could be impacted by its operations, and which the sector can protect, maintain, or recover through fishery management[20]. This pragmatic selection of actually or potentially impacted biodiversity attributes as sectoral conservation targets or focal management targets[21] is comparable to guidance on MPA management effectiveness as MPA managers and stakeholders must also "*select those [biodiversity values] which should be given priority in planning, management and evaluation* and *it is impossible to individually plan for management to ensure survival of every animal species*" (Hockings et al., 2006). These elements for which activities of a sector present a risk and on which the sector should focus its conservation action may be referred to as "biodiversity attributes of concern" (Garcia et al., 2020; Garcia et al., 2019), and they should logically be the elements on which a fishery-OECM identification and performance assessment should be prioritized. There may be cases where fishing is not the threat but may be part of the solution, for example developing harvesting techniques and value chains to cull the invasive lion-fish species from coral reefs (Dahl et al., 2016).

When managing a complex set of biodiversity attributes in an OECM, ABFM, or MPA, not all outcomes of any measure will be positive for all biodiversity attributes (see also Shackell et al., 2021) and even some positive (or negative) effects might be transitory. For example, a measure increasing the abundance of top predators is likely to result also in a decrease in abundance of their prey species in that area, possibly impacting other predators' food sources and potential reproduction rate (trophic cascades). Similarly, the additional exclusion of an impacting gear from an existing ABFM (to be consistent with OECM criteria) may lead to transfer of the gear pressure outside the OECM. The resulting ecological and socioeconomic impacts might reduce the overall net benefit of the OECM. Moreover, if the seabed habitat "recovers" after excluding an impacting gear, the area may become unsuitable for species that were well adapted to its disturbed state, or it may attract communities of predators that impede recovery of populations expected to increase when the fishing pressure was removed. Approaches to address these possibilities might be to modify the OECM boundaries as suggested above (Section 3.3a) or to better harmonize the fishery regulation inside and outside the OECM. Guidance produced for protected areas also had confronted these issues and is another source of useful information to characterise, monitor, and assess biodiversity outcomes from spatial measures.

Actual or intended outcomes?

CBD Decision 14/8 states that the positive biodiversity outcomes of an OECM may be *achieved* or *expected* (Criteria C1). Therefore, the outcomes might be actual (presently occurring and verified) or intended and reasonably expected (e.g., based on simulations, scientific literature, and other information on similar sites and measures, supporting reasonable expectations). A concern could be that the provision for *intended outcomes* might be used as a loophole leading to enlisting of "paper OECMs" that do not produce and may never achieve the alleged outcomes (IUCN-WCPA, 2019:9) (see also Section 4.3). However, such "paper OECMs" would be exposed by the insistence of Decision 14/8 on long-term monitoring of OECM's effectiveness[22]. The frequency of the assessments required cannot be generalized. It is related to the time needed for the benefit to materialize, to the means available for monitoring, and it is implicitly left to States to decide. However, the WCMC reporting guide refers to an updating of States report every 5 years, which could be an incentive to update assessments and detect failing OECMs.

The Decision 14/8 allowance of "*expected outcomes*" to be accounted for in OECM identification also opens the possibility

19 UNCLOS refers to non-target species as "dependent and associated species".

20 E.g., to avoid Significant Adverse Impact (SAI) from fisheries

21 A terminology used, for example, by The Nature Conservation (TNC)

22 E.g., in relation to biodiversity outcomes, governance, equity, costs, and benefits, impacts arising from the OECM status, threats, e.g., in the OECM definition, criteria C4 on monitoring, on adaptive management,

—and may be an incentive—to upgrade existing ABFMs to improve their conservation performance, or create new OECMs, with the recurrent evaluations allowing for the verification of the time needed for the expected outcome to materialize through local ecological dynamics. The same situation happens *de facto* in any MPA and fishery stock restoration programme. Moreover, when identifying an OECM, sufficient biodiversity outcomes may already exist, and some more could be expected to emerge from implementation.

In any case, Decision 14/8 recognizes that its scientific and technical advice is to be "*applied in a flexible and on a case-by-case basis*". For example, the legitimate authority could choose to formally allow a given time for some additional intended outcomes of the OECM to materialize, beyond which the OECM must be reassessed and eventually confirmed or delisted. This time will vary according to biodiversity population parameters (e.g., short- or long-lived species), and although this is not required, States may choose to spell this out when reporting their OECMs to global bodies (UNEP-WCMC, 2019). If desired by States, OECMs not yet meeting sufficiently the required criteria (e.g., if some benefits needed more time to be ascertained and could not yet be considered even as "intended") may remain in the national inventory as "candidates", to be acted upon and monitored as a priority, but not reported in status relative to global targets, until the expected outcomes are confirmed. Moreover, with concern growing about greenwashing and "paper parks" (IUCN-WCPA, 2019:9), there may be calls for periodic transparent evaluations of the effectiveness of *any* conservation measures being reported under many provisions of the GBF, both MPAs and OECMs.

What level of evidence is required?

Decision 14/8 requires that the biodiversity outcomes be demonstrated or soundly predicted (and verified later). However, the level of evidence required to demonstrate actual or intended outcomes of OECMs is not specified in Decision 14/8. The Decision indicates only that the outcomes should be positive and maintained over the long term. Few identification criteria would lead unambiguously to a binary (yes/no) response, and most criteria may be met to some high, medium, or low degree. Considering the range of ecological and socioeconomic situations in which OECMs may be identified, an agreement on "universal" standards of evidence for each criterion and all biodiversity attributes[23] is impossible. Even in very narrow contexts, standards of evidence are complex to develop and costly and time-consuming to apply[24]. Therefore, Decision 14/8 leaves it to the legitimate authorities to determine the satisfactory level of evidence required in each case, and just as with MPAs, the OECMs identified are likely to be of variable "quality" (see Petza et al., 2019, for an illustration). It is important to stress that in most cases, demonstrating that an existing pressure has been effectively suppressed (e.g., that in a deep-sea VME a bottom-contact gear has been effectively excluded through effective enforcement) is faster and easier and more cost effective than demonstrating the biodiversity outcome of such action.

Doubts have been expressed as to whether ABFMs might really produce broader positive biodiversity outcomes than those narrowly related to the target resources. On the one hand, ABFMs have rarely been recurrently assessed for effectiveness —which appears to be extremely sensitive to context (Rice et al., 2018; Shackell et al., 2021). On the other hand, significant positive ecological effects have been observed in partially protected areas (PPAs) relative to open fished areas, suggesting that ABFMs can be valuable, particularly in areas where exclusion of all extractive activities is not a socioeconomically and politically viable option (Sciberras et al., 2013). Moreover, evidence is widespread that populations of marine fish and invertebrates often recover when fishing pressure has been reduced (e.g., Sainsbury, 1988; OECD, 1997; Murawski et al., 2000; Collie et al., 2005; Pitcher et al., 2008; Garcia and Ye, 2018) albeit not always (Shackell et al., 2021). A more complete and recent systematic analysis of the contribution of fishery ABMTs to biodiversity conservation (Himes-Cornell et al., 2022) across a broad range of spatial management showed that many of them, with primary objectives related to fisheries sustainability, do provide co-benefits for biodiversity, conservation, and sustainable development. Himes-Cornell et al. (2022) confirmed that fishery OECMs may contribute positively to biodiversity conservation, but noting that such contribution needs to be confirmed, case by case.

A concern might arise, however, because the performance of ABFMs in relation to their objectives has rarely been recurrently

and in Annexes III and IV (see also Section 3.3.1). The frequency of the assessments cannot be imposed and is left to States, but the WCMC reporting guide refers to an updating of States report every 5 years, which could be an incentive.

23 In CBD Decision 14/8, the term "attributes" is specifically referred to "*communities of rare, threatened or endangered species, representative natural ecosystems, range restricted species, key biodiversity areas, areas providing critical ecosystem functions and services, areas for ecological connectivity*".

24 https://www.msc.org/standards-and-certification/developing-our-standards?gclid=EAIaIQobChMIiaeq7-_H9AIV_QFMCh1dBQwxEAAYASAAEgLCBfD_BwE

assessed[25]. Reasons include the fact that ABFMs act "in concert" with other spatial and non-spatial measures, and there have been few incentives to disentangle the respective contributions of each management measure. In addition, in complex aquatic social-ecological systems, establishing and demonstrating causal relationships is difficult and elusive (STECF-SGMOS, 2007; Rice et al., 2018; Shackell et al., 2021), particularly when climate change is a ubiquitous and overriding driver. The complexity of standard fishery resource assessments increases significantly when conventional monitoring systems need to be upgraded and upscaled to deal with the larger range of biodiversity components of relevance in an OECM. This situation mirrors the difficulty in demonstrating management outcomes of MPAs, e.g., in Australia (MPRA, 2014; GBRMPA, 2019), in the USA (Ovando et al., 2021), and in small-scale fisheries (FAO, 2019a).

Notwithstanding these difficulties, the best scientific evidence available and traditional knowledge need to be provided and, particularly with the incentive added by OECM reporting, the quality of such assessments may improve with time. Initially, assessment of a few key biodiversity attributes may be used as indicator of broader impacts. A strong collaboration between fisheries and conservation science would also be an asset in this regard.

To limit as much as possible the risk of "paper-OECMs" while not missing opportunities to increase conservation outcomes, the tangibility of the "intended outcomes" could be supported by existing literature; modelling; experts' opinions; formal statements and reports by the legitimate authorities; management and monitoring objectives and targets explicitly set for the long term; formal setting of a maximal time for the intended outcomes to materialize; and identification of a special category of "upgradable" or "candidate" OECMs" integrated as OECMs in the fisheries management plans, with dedicated monitoring and assessment (Garcia et al., 2019; cf. Section 4.2).

Fishery-OECMs and conservation standards

Following from the issues addressed in Sections 4.1 to 4.3, three related issues emerged.

a. OECMs may lower international conservation standards?

There is a concern for the risk that fisheries-related OECMs might lower the international standards for area-based conservation established in well-managed MPAs (MacKinnon et al., 2015; Shackell et al., 2021). Certainly, fisheries sustainability, the primary objective of ABFMs, has been threatened for decades by overfishing and IUU (FAO, 2020), raising doubts about the fisheries management capacity to produce the expected biodiversity benefits of OECMs. The concern may also be related to the fact that, for similar reasons, MPAs are often in the same situation and their performance has been regularly questioned (Agardy et al., 2003; Norse et al., 2003; Dichmont et al., 2013; Spalding et al., 2013; Devillers et al., 2014; Klein et al., 2015; Visconti et al., 2015; Jones and De Santo, 2016; and Alves-Pinto et al., 2021). However, the OECM standards adopted in Decision 14/8, together with the requirement for long-term evidence of the positive biodiversity outcomes, sustained governance and management systems, and recurrent monitoring, are separately and, overall, much stronger than those required or historically applied to MPAs (Jonas et al., 2021) and, indeed, very similar to those developed in parallel for green-listed MPAs (Grorud-Colvert et al., 2021). Moreover, broad reviews show that when fisheries authorities devote increased priority to and resources for fisheries assessment and management, outcomes also improve (see case studies in Garcia and Ye, 2018). Therefore, instead of a threat to conservation standards, faithfully implemented fishery OECMs can be argued to represent a good opportunity to involve the fishery sector in the improvement of conservation areas' standards and of its own environmental performance (Garcia et al., 2019; Marnewick et al., 2020; ICES, 2021) in line with the EAF adopted 20 years ago (FAO, 2003) and still developing at different pace in different areas (Juan-Jordi et al., 2017; FAO, 2021; Reum et al., 2021).

b. OECMs may represent an enhanced international standard?

"*OECM Criteria were found to set a much higher bar for evidence of effectiveness in delivering biodiversity conservation benefits (for identification as well as performance reassessment) than is set for designated MPAs*" (ICES, 2020: 27), particularly regarding governance, management, and the burden of proof about positive long-term biodiversity outcomes (CBD, 2018b: Criteria B2, B3, C1 and C2). By comparison, there are no internationally agreed performance criteria for MPAs and the only evidence apparently required is that they are legally designated. As a matter of fact, the process leading to Decision 14/8 and its very detailed set of criteria and principles for OECMs may have set, *de facto*, an upgraded international standard for all conservation areas (Jonas et al., 2021) and the recently developed criteria for the IUCN Green List of Protected and conserved Areas are already largely aligned with them[26].

c. OECMs as a biodiversity conservation label

In relation to the above, it appears to not be clear yet to all concerned that OECMs are not a new type of area-based

25 Also, the same can be said of MPAs.

26 https://iucngreenlist.org/standard/components-criteria/.

measure like MPAs, PSSAs, LMMAs, and ABFMs (Rice et al., 2022). The OECM concept recognizes common biodiversity-related properties in a large range of conservation areas, belonging to existing types, created under different jurisdictions, with their distinctive features and objectives. When recognized as OECM, a closed area does not change either type, function, or specific name. The North Atlantic Haddock box, for example, which is an ABFM protecting Haddock recruitment, would remain what it is, with its name, within its ABFM category, with perhaps additional measures to enhance broader conservation outcomes. It is important to stress that it is not the category of area (e.g., MMA, LMMA, EBSA, or ABFM) that gets the OECM label but the specific, geographically delimited site. However, its recognition as an OECM would provide it with an additional "conservation label" allowing it to be counted against international conservation targets. There should therefore be no fear national or regional fishery authorities that the OECM process might deflect priority attention from their "own" measures.

If not accompanied by additional measures, this labelling, in itself, may not improve global marine biodiversity, but it is a good incentive in that direction and reduces the likelihood that the measure be negatively altered in the future. In addition, it materializes the fact that sustainable use is an integral part of conservation as foreseen in the 1980 World Conservation Strategy (IUCN-UNEP-WWF, 1980) and triggers new conversations across sectors and with civil society about the place of sectoral efforts in conservation.

Conclusions and discussion

Many of the issues likely to be encountered with the mainstreaming of OECMs in marine capture fisheries are likely common to many economic sectors operating in the oceans, particularly those sectors that directly impact biodiversity. Some aspects of these issues, however, are particularly important in marine capture fisheries, given how widespread they are in the world's ocean and the peculiarities of this environment compared to terrestrial ones (e.g., relative opacity, variability, complexity of ecological processes and food chains, hydrodynamics, diversity of interconnected ecosystems, resource mobility, importance of the water mass, complex jurisdictional framework).

Many of these issues, however, are already met in conventional marine fisheries assessment and when using conventional ABFMs. Consequently, in many fisheries, OECMs could be implemented through existing management systems, adding to them if necessary to maintain and enhance biodiversity benefits in the long term. Considering how slowly Target 11 was approached in the last decade, boosting the identification of OECMs in marine fisheries is probably one of the best ways for States to meet their "30x30" commitment for conservation coverage in the ocean ecosystems at an affordable political, financial, and social cost, while still improving biodiversity outcomes. In the high seas, the role of RFMOs and RSOs is primordial.

Notwithstanding, the value of developing fisheries-specific guidelines for mainstreaming OECMs in capture fisheries in the ocean, but certainly also inland, is clear. If well adapted to the range of contexts in which they will apply, they will help in ensuring the correct direction, cost effectiveness, and coherence of the action, providing a "translation" of Decision 14/8 with clarifications and interpretations specifically for the sector (FAO, 2019; Garcia et al., 2019; ICES, 2021). For example, OECM guidance may need specific provisions for small-scale and large-scale fisheries; in densely populated coastal areas; in the high seas; and under multiple jurisdictions. These issues will be taken into account by FAO following the mandate given by its Members at the 34th Committee on Fisheries to develop such guidelines for fisheries in the near future.

Other issues not yet fully addressed and sometimes not even explicitly mentioned in publications or meetings may emerge in the near future. For example, it may already be time to start thinking about the need and ways to dynamically adapt OECM parameters to climate change as species will continue to move, including across jurisdictional boundaries (Pinsky et al., 2018). It might also be important to consider the potential role of OECMs in the context of Payments for Ecosystem Services (PES) or "green banks" as already done for forests, as well as nature-based solutions (NbS), keeping in mind the controversies about this concept.

Mainstreaming OECMs in marine capture fisheries is a golden opportunity for an increased and more effective collaboration between authorities respectively in charge of fisheries and biodiversity conservation, at national, regional, and global levels (e.g., between FAO, IUCN, CBD, and other partners). The OECM identification process has started slowly, in a few leading States, but for its smooth, fast enough, and correct evolution, there is a need for more rapidly shared learning, empowered coastal communities, and stronger management partnerships and capacity-building, particularly in developing countries. Once OECMs are finally recognized, their management and recurrent performance assessment will be the real challenge if the potential they offer to reduce collateral impact, improving conservation and fostering sustainable use, is to be realized. As such, together with other ABMTs, fisheries-related OECMs will contribute to the 100% recognition, protection, and sustainable use of IPLC land and territories (CBD, 2019), as well as to the 2020 commitment of the High Level Panel For a Sustainable Economy to achieve 100% sustainable ocean management in EEZs, by 2025 (https://

oceanpanel.org/14-world-leaders-commit-100-percent-sustainable-ocean-management-solve-global-challenges/).

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SG lead the paper conception, elaboration and finalization. All authors contributed to the article and approved the submitted version.

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