



Charting the value and limits of other effective conservation measures (OECMs) for marine conservation: A Delphi study

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ABSTRACT

Other effective conservation measures (OECMs) will play an important role in the Post-2020 Global Biodiversity Framework as a way for governments to achieve “30 × 30” (30% protection of land and oceans by 2030). However, the policy tool remains relatively new, is expanding from multiple perspectives, and requires clarification. We conducted a Delphi study – a structured technique designed to elicit the insights of a panel of experts – to chart the value and limits of OECMs for marine conservation. Results of the Delphi reveal a high degree of consensus on several core areas of this emerging policy tool. Experts agreed that OECMs can advance equitable and effective conservation. Realizing these opportunities will require strengthening local and Indigenous rights and prioritizing principles of social equity. The panel also agreed on five key challenges, ranging from ensuring that the burden to prove effectiveness does not fall to local communities to securing adequate resources to support OECMs. In contrast, no consensus was reached on how to measure the effectiveness of OECMs, highlighting the need to develop shared monitoring guidelines. Taken together, these findings outline a clear policy and research agenda to support the contributions of OECMs towards equitable, effective, and enduring conservation.

1. Introduction

This is a decisive year for global biodiversity. Parties to the Convention on Biological Diversity (CBD) are in the final stages of negotiating the Post-2020 Global Biodiversity Framework [6]. Intended to succeed where the Strategic Plan for Biodiversity 2011–2020 has fallen short [9], the stakes could not be higher [22]. Parties to the CBD are calling for transformative change to address biodiversity loss [6]. The negotiations present a unique global policy juncture to re-imagine global biodiversity goals, including the need for achieving biodiversity outcomes and equitable and effective management [9,14,31].

With other effective area-based conservation measures (OECMs) rapidly gaining attention in conservation policy, this policy tool looks set to play an important complement to protected areas in the next decade of biodiversity conservation [6,18,24]. Defined formally in 2018, an OECM is 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” [23]. OECMs are different from protected areas in that OECMs do not need to have biodiversity conservation as a primary objective to deliver the effective in-situ conservation of biodiversity [24]. This policy tool can be used to recognize new or existing management that sustains biodiversity, including, for example, areas managed by Indigenous Peoples and local communities, such as fisheries-management areas [11].

While OECMs have the potential to advance equitable and effective marine conservation [18], the concept remains relatively new and requires clarification and practical guidance. In addition, prominent global groups including the Food and Agriculture Organization (FAO) and the International Union for Conservation of Nature (IUCN) are currently negotiating OECM guidelines, meaning the concept continues to evolve from multiple perspectives [4,13,23].

Important questions remained to be answered: What are the core opportunities presented by the inclusion of OECMs in the post-2020 framework? What are the key challenges or constraints confronting OECMs in practice? How can policy-makers best identify, recognize,

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support, and report OECMs to ensure they deliver equitable and effective conservation in the long-term?

This paper aims to contribute to the negotiation, and subsequent implementation, of OECMs as a complementary tool to protected areas to meet global biodiversity objectives. Using a Delphi study, we synthesize the perspectives of 18 interdisciplinary scientists, practitioners, and policy-makers on the value and limits of OECMs for marine conservation. Results from this study indicate that there is high expert consensus on the promise of OECMs to support equitable and effective marine conservation undertaken by a more diverse set of actors. In addition, experts agreed on five key challenges that policy-makers must strive to overcome. However, no consensus was reached on how to measure the 'E' for effectiveness of OECMs. For policy-makers, results suggest that the development of shared guidance on overcoming multiple challenges, including how to measure effectiveness, is an urgent priority. We hope that this study will serve as a basis for future research and development of OECM guidelines.

2. Methods

To understand the value and limits of OECMs for marine conservation, we employed a Delphi study [28]. The Delphi study is a structured technique designed to build expert consensus on complex policy issues, which has been applied in conservation research (e.g., [32,38]). We adopted the Delphi method as the main aim of this study was to move toward consensus on the value and limits of OECMs for marine conservation, while minimizing social pressures or biases. The Delphi approach allows for anonymous collection of responses from the participants, therefore, eliminating biases such as groupthink, halo effect, egocentrism, and dominance [34]. In addition, the Delphi method is suitable in the context of this research as it can increase the understanding of less understood topics and generate new insights on emerging topics [34].

We identified expert panelists using a non-probability sampling method [41]. We invited all twenty-six members of the Coastal Outcomes working group (<https://snappartnership.net/teams/coastal-outcomes/>), funded under the Science for Nature and People Partnership (SNAPP) program, to participate in the study via email. We purposefully recruited participants via the SNAPP Coastal Outcomes working group to elicit expertiz from a highly diverse group of marine conservation actors. More than half of the expert panel is comprised of marine conservation policymakers and practitioners, who work for some of the world's leading international conservation and development organizations, including the Food and Agriculture Organization (FAO), the International Union for the Conservation of Nature (IUCN), Wildlife Conservation Society, and RARE. The remainder of the panel is comprised of interdisciplinary academics with training in a broad range of marine and coastal disciplines, including marine ecology, conservation biology, geography, resource management, and sustainability science, among others. Members of the expert group work in Africa, South-East Asia, North America, the Caribbean, and Europe. Together, the panel holds decades of experience in engaging with the ecological, social, and institutional factors that shape marine conservation processes and outcomes. The expert panels have authored hundreds of publications on marine conservation, demonstrating their knowledge and experience over the years. In total, 18 experts participated in this study. The literature indicates that between 10 and 15 experts are recommended for Delphi studies [34]. As the rounds progressed, the number of participants dropped, which is commonly observed in Delphi studies [34]. In this study, 14 experts participated in Round 2, while Round 3 recorded participation from 8 experts.

The experts participated in three rounds of the Delphi study hosted by the Qualtrics survey platform (<https://www.qualtrics.com/>). Despite a growing literature on OECMs [1,10,11], key questions remain regarding the opportunities and challenges associated with the identification, recognition, reporting, and supporting of OECMs, particularly

in the context of marine conservation. To elicit specialist perspectives on these areas, experts were asked to respond to three open-ended questions in Round 1:

1. What are the key opportunities created by the recognition of marine OECMs as counting towards Convention on Biological Diversity (CBD) percent area targets?
2. What are the key challenges associated with the implementation of marine OECMs?
3. How should the "effectiveness" of marine OECMs be evaluated and reported, and by whom?

Responses to the survey were recorded anonymously and coded. The coding process involved open and axial coding, where similar responses were grouped together as themes emerged and assigning labels or codes [42]. Inter-researcher verification added rigor to the qualitative analysis.

Through this process, we developed a list of 65 statements in response to the three research questions.

In Round 2 of the Delphi study, experts were asked to establish the importance of the statements identified in the first round on a 5-point Likert scale. A central part of Delphi data analysis involves the movement toward consensus and the retention of items in the subsequent round. Following other published Delphi studies [35], we used a 75% cut-off criterion, which indicates that more than 75% of experts 'agreed' or 'strongly agreed' with a statement. Only statements that met the 75% cut-off criterion were retained for Round 3.

Round 3 of the Delphi process sought to move toward consensus on the importance of each retained statement. In the final round, members of the expert panel were asked to evaluate the level of importance that they assigned to each statement in Round 2, reflect upon the importance, and decide whether they would like to retain their original response or adjust it.

3. Results

In Round 1, experts generated a list of 28 key opportunities created by the recognition of marine OECMs. Of the opportunities identified, 20 were unique and retained for ranking in Rounds 2 and 3. By Round 3, consensus was achieved for 60% ($n = 12/20$) of the key opportunities (Fig. 1; Table S1). According to the expert panel, marine OECMs can promote more *equitable* and *effective* marine conservation. Opportunities with consensus include:

- 1) The recognition and inclusion of existing local marine management (e.g., locally managed marine areas (LMMAs), community-based resource management (CBRM)),
- 2) The recognition and inclusion of more diverse forms of conservation,
- 3) Increased support for OECMs by national governments,
- 4) Increased collaboration between conservation, fisheries, local, and Indigenous actors,
- 5) Strengthened customary tenure rights,
- 6) More holistic assessment of the full extent of marine conservation efforts,
- 7) Increased access to conservation resources (e.g., funding, enforcement),
- 8) The achievement of conservation outcomes in areas outside of MPAs,
- 9) Greater engagement of fisheries departments in conservation,
- 10) The inclusion of new actors in marine conservation,
- 11) Sharing of the costs and benefits of conservation across a wider group of actors, and
- 12) Greater balance between achieving biodiversity benefits and human well-being.

Consensus around other effective area-based conservation measures (OECMs)

Responses of an expert group through a Delphi analysis

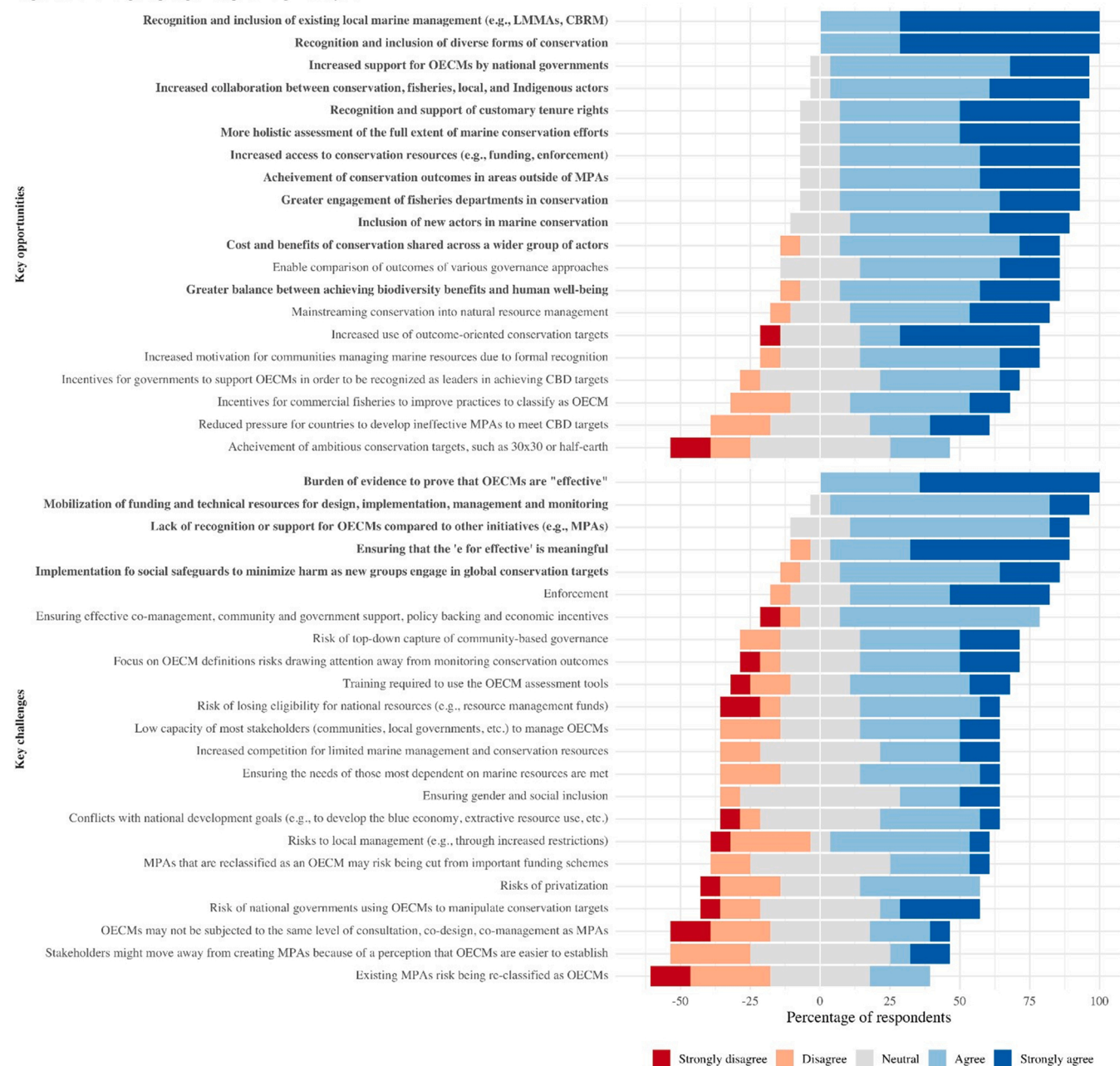


Fig. 1. Perspectives of a panel of international marine experts (n = 18) on key opportunities and challenges associated with identifying, recognizing, reporting, and supporting marine OECMs. Bold font signifies statements for which consensus was reached (defined as >75% of experts ‘agreeing’ or ‘strongly agreeing’).

Next, experts identified 32 key challenges associated with marine OECMs. Of the challenges identified, 23 were unique and retained for ranking in Rounds 2 and 3. By Round 3, consensus was achieved for 22% (n = 5/23) of the key challenges (Fig. 1; Table S2). According to the expert panel, key challenges for marine OECMs include:

- 1) Assuring that the burden to prove effectiveness does not fall to already under-resourced local and Indigenous communities,
- 2) Mobilizing sufficient resources to support the recognition and reporting of OECMs,
- 3) The relative lack of understanding of OECMs in comparison to protected areas,
- 4) Ensuring that OECMs are not misused to reduce marine conservation regulations, and

- 5) Ensuring social safeguards to minimize harm to new groups’ livelihoods, cultures, and norms as they engage with global conservation targets.

Panelists identified 13 approaches for evaluating the effectiveness of marine OECMs, all of which were unique and retained for ranking. No consensus was achieved on how to evaluate marine OECMs (Fig. 2; Table S3). The range of proposed evaluation approaches included a range of ecological indicators (e.g., fish biomass and coral cover) and social indicators (e.g., local support and equity in the management of the area). Experts also highlight the importance of using quantitative and qualitative data, drawing on expert opinion and empirical data, and integrating multiple knowledge sources to evaluate the effectiveness of marine OECMs.

Consensus around other effective area-based conservation measures (OECMs)

Responses of an expert group through a Delphi analysis

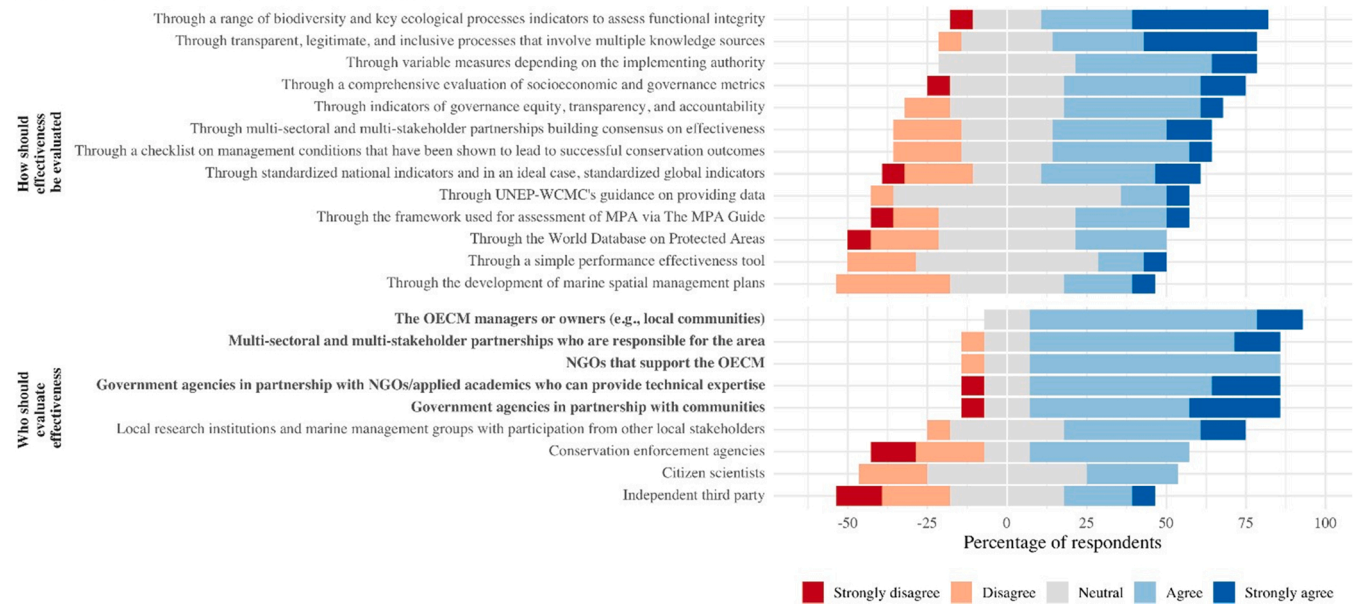


Fig. 2. Perspectives of a panel of international marine experts (n = 18) on how to measure the ‘E’ for effectiveness of OECMs and who should be responsible for measuring effectiveness. Bold font signifies statements for which consensus was reached (defined as >75% of experts ‘agreeing’ or ‘strongly agreeing’).

Finally, experts identified 9 actors, or groups of actors, who should be responsible for evaluating the effectiveness of marine OECMs. All nine were all retained due to their uniqueness. By Round 3, consensus was achieved for 56% (n = 5/9) of the actors who should be responsible for evaluating the effectiveness of marine OECMs (Fig. 2; Table S4). The panel agreed that OECMs should be evaluated by:

- 1) The OECMs’ managers or owners (e.g., local communities),
- 2) Multi-sectoral and multi-stakeholder partnerships,
- 3) NGOs that support OECMs,
- 4) Government agencies in partnership with NGOs and/or applied academics with technical expertise, and
- 5) Government agencies in partnership with communities.

4. Discussion

Our goal in this paper is to assist Parties to the CBD in interpreting and operationalising Decision 14/8 and to contribute to a growing body of best practice around OECMs [11,18,25]. Three key results arose from our Delphi study of experts, which have important implications for conservation policy and practice. First, we found consensus on twelve opportunities that OECMs present to promote equitable and effective conservation. Second, the conservation experts reached consensus on several key challenges for operationalizing the OECM policy tool. Third, no consensus was reached on how to measure the ‘E’ for effectiveness of OECMs. We discuss each finding here in turn.

First, our results suggest that OECMs offer multiple and significant opportunities to support equitable conservation. Perhaps most importantly, experts in this study agreed that the OECM tool provides opportunities to recognize existing and diverse forms of local management as part of global conservation efforts. To realize this potential, the processes for recognizing OECM must strengthen local governance systems, including tenure rights, rather than displace or erode them [18]. Indeed, much of the world’s biodiversity is found within Indigenous territories (ceded and unceded), and guaranteeing Indigenous rights of self-determination on these lands is essential [14].

Respecting human rights and upholding local and Indigenous values, knowledge, and institutions are increasingly recognized as crucial to

global conservation efforts [24]. Strengthening local and customary rights will require new policy guidelines advocating for rights-based conservation approaches. Their development can draw on existing guidelines, such as ‘Conservation with Justice’ [17] and ‘The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries’ [12,39].

Supporting diverse, inclusive, and equitable marine conservation through OECMs will also require that the conservation community prioritize social equity [37] across its three key dimensions of recognition (e.g., [30]), distribution (e.g., [19]) and procedure (e.g., [36]). Formal commitments to social equity now characterize most major conservation policies and conventions (e.g., [5]). Yet, a long history of displacement and exclusion in the name of conservation indicates there is still much work to be done to mainstream equity in marine conservation [2,3]. To ensure that policy commitments to equity translate into practice, global policy organizations, like the CBD and IUCN, should ensure that policy frameworks, including the Post-2020 Biodiversity Framework, include considerations of social equity, provide guidance to national governments and other groups to operationalize equity principles [20], and include indicators of equity in monitoring and evaluation (e.g., [33,44]).

Experts in this study also agreed that marine OECMs present important opportunities to support effective biodiversity conservation. Our study highlights the potential for OECMs to attract increased support and resources for marine conservation. For example, fisheries co-management or community-based fisheries management initiatives could apply for conservation funding that may have been previously unavailable to them. Experts also agreed that OECMs could contribute to more holistic assessments of the full extent of marine conservation efforts. In this way, OECMs, which by definition must be effective [24], present an opportunity to refocus targets around conservation outcomes as opposed to percent coverage targets [18]. Finally, experts highlighted the opportunity for OECMs to support the achievement of effective conservation in areas outside of marine protected areas. This finding aligns with the extensive literature demonstrating the importance of drawing on diverse management strategies to realize marine biodiversity outcomes [8].

Our second key finding highlights five core challenges that policy-makers and the conservation community should strive to overcome. First, experts agreed that the burden to demonstrate effectiveness

presents a significant challenge. Ensuring that this responsibility does not fall to local communities will require innovative methods. Mobilizing big data could be used to complement - and to alleviate the burden of - local and resource intensive monitoring [26]. For example, remote sensing data can be used to measure changes in marine biodiversity [27].

However, technological monitoring methods are also resource intensive and might be inequitable accessible to countries that do not have the resources to deploy them [15]. A cost-sharing mechanism should be explicitly integrated into the post-2020 framework [15]. For example, nationally determined contributions (NDCs) in the Paris Agreement could serve as a model for equitable distribution of the responsibility for monitoring effectiveness, where wealthy nations shoulder the majority of the costs.

Experts highlighted the need to mobilize sufficient financial and staff resources to support marine OECMs as a second key challenge. Avoiding resource shortfalls is critical because the ecological outcomes of MPAs are often hindered by inadequate budget and staff resources [16]. Averting this challenge will require increased investments in marine conservation [18], potentially looking beyond traditional conservation funders to support from international development agencies and multi-lateral development banks, among others.

A third key challenge is the lack of awareness about OECMs in comparison to protected areas. To help mainstream the concept, policy-makers should include OECMs in other global environmental agreements, such as the Sustainable Development Goals (SDGs) and the UN treaty on marine biodiversity for the high seas [18]. The draft monitoring framework for the Post-2020 Biodiversity Framework, which documents the linkages between the Post-2020 Framework and the SDGs, is a welcome start in this direction [7].

Fourth, experts in this study raised the concern that countries could purposefully manipulate OECMs to meet quantitative area-based targets in the Post-2020 Global Biodiversity Framework [1,40]. Canada, for example, has been criticized for providing insufficient evidence of the conservation effectiveness of more than 50 fisheries closures that were classified as OECMs [29]. Policy-makers can help avoid this risk by prioritizing the development of guidelines for measuring effectiveness.

A fifth challenge identified by the expert panel is the need for social safeguards to prevent harm to local and Indigenous communities as they engage with global conservation targets. This reflects a key concern currently being voiced about OECMs, that they could lead to land or sea grabs by external actors [18], as has sometimes been the case with protected areas (e.g., [21]). As noted previously, new policy guidelines will be required to ensure that OECMs strengthen local governance, secure tenure rights, and do not erode self-determination through imposition of external worldviews via global conservation frameworks [18].

Finally, while Delphi experts reached consensus on *who* should monitor effectiveness (including local managers, governments, NGOs and partnerships among them), experts reached no consensus on *how* to measure effectiveness. This finding suggests there is much work for the global conservation community on monitoring and evaluation of OECM outcomes. For example, developing shared guidelines to measure effectiveness of OECMs through monitoring will be essential to ensure that sites deliver conservation outcomes [43]. The Global Database on Protected Area Management Effectiveness (GD-PAME) was developed as the official repository for reporting effectiveness to the CBD, yet it currently only contains data on whether an assessment of management effectiveness has been undertaken, with no information about other critical variables such as financial or staff capacity or biodiversity outcomes [15,16]. Combining remote sensing data and field observations to measure biodiversity outcomes could be a useful way to share the burden of monitoring between local communities and national or international organizations [15].

Importantly, experts agreed that multiple actors need to engage in evaluation, highlighting the need for transdisciplinary knowledge co-

production to develop evaluation processes and for collaborative approaches to undertaking evaluation [18].

We employed a Delphi study to generate consensus around the value and limits of OECMs in marine conservation. Before concluding the article, we would like to highlight several limitations of this approach. First, one of the limitations of Delphi studies is the relatively small sample size [34]. This study, for example, synthesized the perspectives of 18 experts. Going forward, we recommend that similar studies be conducted with other expert groups to incorporate broader perspectives on the role of OECMs in marine conservation. A second limitation of applying the Delphi method for conservation research is that the consensus-based nature of the approach can lead to a diluted version of the preferred option(s). As the Delphi rounds progress, members of the group may inadvertently align with the majority viewpoint [34]. In addition, future studies might consider face-to-face discussion after anonymous iteration since this process can lead to greater accountability and corroboration of study outcomes [34].

5. Conclusion

As we enter what is arguably the most important decade for biodiversity conservation, supporting equitable and effective protected and conserved areas is essential. Drafts of the Post-2020 Biodiversity Framework suggest that OECMs will play an increasingly important role, along side protected areas, in the conservation toolkit going forward. In this context, understanding the value and limits of OECMs for conservation is timely and important. We find that experts agree on the value of OECMs for promoting equitable and effective marine conservation. Realizing these opportunities will require strengthening local and Indigenous rights and prioritizing principles of social equity, particularly to ensure appropriate consent for OECM recognition. Second, experts agreed on five key challenges for OECMs, ranging from ensuring that the burden to prove effectiveness does not fall to local communities to securing adequate financial and human resources to support OECMs. Finally, no consensus was reached on *how* to measure the 'E' for effectiveness, suggesting that concerted efforts to develop shared or common set of guidelines for measuring the effectiveness of OECMs is a priority for the conservation community. Taken together, these findings outline a clear policy and research agenda to support the contributions of OECMs towards equitable, effective, and enduring conservation in a post-2020 world.

CRedit authorship contribution statement

Bani Maini: Conceptualization, Methodology, Formal analysis, Writing – original draft. **Jessica L. Blythe:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Emily S. Darling:** Conceptualization, Software, Visualization, Writing – review & editing. **Georgina G. Gurney:** Conceptualization, Writing – review & editing.

Data availability

Data will be made available on request.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.marpol.2022.105350](https://doi.org/10.1016/j.marpol.2022.105350).

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