



# A Contrast of Criteria for Special Places Important for Biodiversity Outcomes

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### Specialty section:

This article was submitted to  
Marine Conservation and  
Sustainability,  
a section of the journal  
Frontiers in Marine Science

Received: 03 April 2022

Accepted: 24 May 2022

Published: 23 June 2022

### Citation:

Rice J, Friedman K, Garcia S, Govan H  
and Himes-Cornell A (2022) A  
Contrast of Criteria for Special Places  
Important for Biodiversity Outcomes.  
*Front. Mar. Sci.* 9:912031.  
doi: 10.3389/fmars.2022.912031

This paper contrasts seven spatial biodiversity conservation area designations by six different bodies: Other Effective Area-Based Conservation Measures (OECMs), and the Ecologically and Biologically Significant Areas (EBSAs) of the Convention on Biological Diversity (CBD); the Vulnerable Marine Ecosystems (VMEs) of the Food And Agriculture Organization (FAO); the Key Biodiversity Areas (KBAs) under criteria developed by the IUCN; the Areas of Particular Environmental Interest (APEIs) of the International Seabed Authority (ISA); the Particularly Sensitive Sea Areas (PSSAs) of the International Maritime Organization (IMO); and the Locally Managed Marine Areas (LMMAs) used by small island States in the Pacific Ocean; on five themes: biological and ecological features, functions served by areas receiving these labels, governance, threats and pressures, and other considerations. The seven different labels for such areas were generally similar in the biological and ecological criteria to be met, and the functions typically served by these areas. Differences among the labels increased when considering governance, threat and pressures, and other considerations. Implications of these similarities and differences for policy development and outcomes are discussed. Performance reviews of the various labels under these themes could provide insight into both the effectiveness of the provisions in the Agreements and Decisions and how evidence is acquired and used to inform their application, allowing improvements to each approach to learn from experiences with other labels.

**Keywords:** EBSA, OECM, LMMMA, APEI, PSSA, VME, criteria, biodiversity

## INTRODUCTION

Over recent decades, there has been increasing recognition of the importance of enhancing the priority given to conservation of places that have special importance for biodiversity (Lopoukhine and Ferreira de Souza Dias, 2012; Ovando et al., 2021). Various types of biodiversity features may contribute to an area's prioritization for enhanced risk aversion in management, including the presence of rare or vulnerable species (Walsh et al., 2013; Mamo et al., 2020), exceptional structural complexity and/or diversity of habitat features (Airoldi et al., 2008; Lipcius et al., 2019), critical

functional significance such as the role of the areas as a migration corridor (Boulton et al., 2016; Lederhouse and Link, 2016), or simply by being in a comparatively undisturbed state (Bryan et al., 2011; Bax et al., 2016). Particular sites may be proposed as a priority for enhanced risk aversion due to even a single one of these types of features, but the features also may occur in a variety of combinations.

The value of targeting conservation measures on Special Places<sup>1</sup> has been widely recognized by States, and other authorities responsible for conservation or protection of biodiversity, other authorities responsible for managing sectors that use or impact on biodiversity, and by interest groups focused on such conservation and/or management concerns. Each interest group may suggest and each jurisdictional authority may put in place a variety of spatial and non-spatial measures informed by the context of their historical engagement, each one using tools developed and refined within their respective mandates and competencies to increase the likelihood that these Special Places do indeed receive enhanced conservation and protection (FAO, 2011; Clark et al., 2020; Henriksen, 2020; O'Leary et al., 2020). Many of the papers in this special issue illustrate specific cases of such measures and actions taken.

Authorities and interest groups often communicate with each other about their spatially based plans and approaches. Individual experts associated with the various jurisdictions and interest groups often attend multi-disciplinary workshops and meetings of multilateral agreements and Conventions (Gjerde and Breide, 2003; FAO, 2007; CBD, 2018). Nevertheless, there is a tendency for each jurisdiction to adopt and implement strategies for management and conservation of biodiversity that are built around their customary practices, again at least partially justified by the need to respect their specific mandates and competencies, demonstrate transparency and accountability in their decisions and actions, and to make best use of their diverse expertise, experience, and capacity.

These processes of adopting and revising measures tend to be incremental and evolutionary, such that many different jurisdictional authorities and global conservation interest groups that have developed their own definitions, criteria and standards for identifying and acting as custodians for areas that warrant the application of enhanced conservation action also adopt their own measures to provide the desired level of enhanced protection (Maestro et al., 2019). Again, many papers in this special issue give specific cases of these jurisdiction-specific choices and how they are applied in practice.

This review and analysis focuses on a broad range of approaches, including Other Effective Area-Based Conservation Measures (OECMs), and the Ecologically and Biologically Significant Areas (EBSAs) of the Convention on Biological Diversity (CBD); the Vulnerable Marine Ecosystems (VMEs) codified by the Food And Agriculture Organization (FAO); the Key Biodiversity Areas (KBAs) using the criteria developed by the IUCN; the Areas of Particular Environmental Interest (APEIs) of the International Seabed Authority (ISA); the Particularly Sensitive Sea Areas (PSSAs) of the International Maritime Organization (IMO); and the Locally Managed Marine Areas (LMMAs) used by small island States in the Pacific Ocean.

The names and acronyms used by each source are collectively referred to as “labels” in this paper.

The similarities in origin and subsequent translation into policy and practice summarized above means that spatially-based conservation of Special Places<sup>1</sup> have potential similarities among jurisdictions. However, there can be differences among jurisdictions in several aspects of the identification and conservation of their respective Special Places. These differences can be described to exist in:

- The types of features whose presence are or are not included as criteria for Special Places;
- The functions the Special Places are supposed to provide for nature and for people;
- The governance processes relevant to their identification and management of the Special Places, and
- How potential threats to the biodiversity features are managed.

There also can be differences among jurisdictions in how similar criteria, functions and measures may be framed, even when the definitions and their intents may seem to be similar.

Moreover, development and adoption of these criteria and measures for identifying and protecting their Special Places has occurred at different times for various jurisdictions (**Table 1**). This means jurisdictions coming to the task later may have learned from and built on the efforts of other jurisdictions undertaking the task earlier. Also as experience with a particular set of criteria grows and lessons from other sets of criteria accumulate, various experts and sometimes a jurisdiction itself may reinterpret criteria already adopted, to take the additional knowledge and experience into account (<https://www.cbd.int/ebsa/about>).

This parallel, but asynchronous, development of definitions and criteria for Special Places among jurisdictions and global interest groups has also created opportunities for experts from one jurisdiction or interest group to assert particular relationships exist between their criteria and measures with those of other jurisdictions (Nelson and Burnside, 2019; Harvey et al., 2021). This is facilitated when original international agreements leave room for flexible implementation of their provisions in different social, economic and environmental contexts. In addition, multiple interest groups or perspectives with different backgrounds may independently interpret the intent and application of the criteria adopted by other jurisdictions according to their own approaches, culture, and preferences. This may result in multiple guidance documents for some sets of criteria being produced, as has happened for example, with OECMs, where multiple groups have provided guidance on the application of the criteria included in Decision 14/8 of the CBD, (see Garcia et al. this special issue).

As presented above and in **Table 1**, the proliferation of descriptor names (‘labels’) of areas that warrant and are

<sup>1</sup>For this manuscript, the term “Special Places” will be used when referring collectively to all the individual cases which have been found to meet the criteria used by one or more of the jurisdictions. When single specific cases are being referred to, the terms “site” or “area” will be used.

intended to receive enhanced biodiversity conservation can be confusing. Different claims made by different experts regarding the similarities and differences of the intent and actions (taken or not taken) by different jurisdictions or interest groups (Zupan et al., 2018; Galparsoro and Borja, 2021) can both confuse and set up barriers to cooperation on biodiversity conservation and sustainable use, that can delay progress on making use of area-based management measures, or in achieving their stated goals (e.g. UN Environment Program, 2021).

The present work is limited in scope to looking at the specific definitions/criteria and associated functions for labels that were officially adopted by key marine jurisdictions or associated governance processes, to see how much overlap actually occurs, and where major differences, if any, may be found. Throughout the paper, the text in jurisdictional Agreements or their equivalents are being compared, but not the Special Places themselves. Comparisons include cases where there was explicit linkage in the agreed language of particular governance and management actions to particular types of Special Places, in cases where such linkages are made. This scope is necessary for two reasons. First, it is not feasible to systematically track how completely each jurisdiction or interest group has actually applied the specific definitions and criteria it has adopted, so it is only the definitions/criteria themselves that can be taken as reflecting the

will of the Parties to the jurisdiction or adherents to the interest group. Second, there are sometimes numerous subsequent reinterpretations and critiques of each set of criteria. Often these actions are undertaken by small groups of experts and have neither explicit endorsement nor binding status relative to the full jurisdiction or interest group that originally adopted the criteria (e.g. Clark et al., 2014; Morato et al., 2018; Johnson and Kenchington, 2019). Consequently, this paper only considers the original Decisions or their governance equivalents. To avoid having the text be read as comparing the areas themselves rather than the jurisdictional Agreements or their equivalents, this paper will refer to contrasting the labels that are used by the various approaches, and not contrasting the collections of Special Places to which the labels have been attached.

## METHODS

We identified six Intergovernmental Organizations or global non-governmental organizations (NGOs) as using definition/criterion-based designations of areas considered special enough to warrant enhanced conservation and management actions for protection of biodiversity. For each organization, we identified the respective authority's Conference of Parties Decision or

**TABLE 1 |** Interpretation of scores used in **Tables 2–6** and sources of the foundation documents for each of the labels.

Scores assigned:

N - Necessary: The property must be present for an area to receive a positive status designation. However other factors could be relevant for any status determination. Consequently the absence of this property justifies a negative status determination, but its presence alone may not ensure a positive determination.

S - Sufficient: The property is not essential for a positive status determination, but if present, it is sufficient to justify a positive status determination even if other factors are absent.

C - Considered: The property is neither necessary nor sufficient for a positive status determination. However, it is relevant and its presence (or absence) influences the determination of status, along with the presence or absence of other properties. Positive or negative status determinations are based on a judgement of the aggregate mix of properties present and absent in the area.

U - Undesirable: The presence of the property reduces but does not negate the likelihood of a positive status determination.

P - Prohibitive: If present, the property would require a negative status determination.

D = Desirable - The property is not essential but suitability for positive status designation is enhanced if the property is present.

I = Inferred - The property is not explicitly mentioned in the Decision or Guidance Document, but logically would have to be present to allow the presence of other properties that contribute to a positive status determination.

For ALL scorings in the tables, a "+" sign next to a score indicates that a provision of a Decision refers explicitly to the property or contains a phrase that experts would readily interpret as referring to that property. Absence of a + sign means the Decision communicates the intended status for the property clearly but the language used in the Decision does not include the exact phrase or a close cognate in any specific provision.

Empty cells in the tables indicate that the Decision is silent on the topic. No guidance is provided on whether the property is desirable or undesirable, and its presence or absence does not logically make other relevant factors exceptionally more or less likely to be present. A potential cost of increasing numbers of empty cells in a table is that that status decisions of the corresponding jurisdiction are based on fewer and fewer properties of each site.

Sources of document(s) scored for each label.

OECM (Other effective area-based conservation measures) - Decision Adopted By The

Conference of the Parties to the Convention on Biological Diversity: 14/8. Protected areas and other effective area-based conservation measures. Annex III - Scientific and Technical Advice on Other Effective Area-Based Conservation Measures. <https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-08-en.pdf>

VME (Vulnerable marine ecosystem)- FAO VME Criteria As defined in the International Guidelines for the Management of Deep-sea Fisheries in the High Seas (FAO, 2009). <https://www.fao.org/in-action/vulnerable-marine-ecosystems/criteria/en/>

EBSA (Ecologically and biologically significant area) - CBD COP 9 Decision IX/20. Marine and coastal biodiversity. Annex I Scientific Criteria For Identifying Ecologically Or Biologically Significant Marine Areas In Need Of Protection In Open-Ocean Waters And Deep-Sea Habitats <https://www.cbd.int/decision/cop/?id=11663>

KBA (Key biodiversity area) - IUCN Guidelines for using A global standard for the identification of Key Biodiversity Areas: version 1.1. <https://portals.iucn.org/library/node/49131>

APEI (Areas of particular environmental interest) International Seabed Authority - Areas of Particular Environmental Interest (or "Protected Areas") for Ecosystem-based Management of the Clarion-Clipperton Zone: Rationale and Recommendations to the International Seabed Authority. <https://www.isa.org.jm/files/documents/EN/Workshops/2010/Pres/SMITH.pdf>

PSSA (Particularly sensitive sea areas) - International Maritime Organization A.982 (24) Revised guidelines for the identification and designation of Particularly Sensitive Sea Areas (PSSAs) <https://www.imo.org/en/OurWork/Environment/Pages/PSSAs.aspx>

LMMA (Locally marine managed areas) - LMMA Learning Center Guidance document. <https://lmmanetwork.org/learning-centre/>

comparable binding policy action taken by the appropriate governance body. **Table 1** presents links to these sources.

Within each source document, we extracted the definition/criteria and expected functions of the Special Places that were adopted as guidance and standards when determining which areas were appropriate to include in their list of Special Places. In cases when governance or management actions were necessary or expected when an area was assessed to meet criteria and added to its list of Special Places, we tabulated those actions. All tabulations used the exact phrases in the 'Decision' language and/or governance bodies foundational documents.

Once the initial tabulations were complete, we evaluated them for commonality and differences in intent among five themes for the definitions/criteria and actions. This demanded some degree of subjectivity in scoring, given that phrasings were not standardized among the initial documents, and jurisdictions differed in preference for either terse Decisions that necessarily incorporated somewhat generic language and broad provisions, to those that used high specificity in Decisions with much more disaggregated criteria and detail in associated provisions. To facilitate the comparisons among labels, we tabulated jurisdictional treatments of five themes (**Tables 2–6**). The themes for comparison were, i) biological and ecological criteria used to identify Special Places (**Table 2**); ii) functions the Special Places are expected to serve for nature and/or for people (**Table 3**); iii) governance processes appropriate for determining and managing the Special Places (**Table 4**); iv) threats that were specified as requiring special management in the Special Places (**Table 5**); and v) any other relevant Considerations that might be explicit in the Decisions or comparable sources (**Table 6**). These themed tables constitute the core results for this review and analysis. Each label comprises a separate column in each table, allowing comparisons across rows for each of the five themes, so it would be possible to show:

- Similarities amongst labels: Properties that are referenced in explicit and similar ways by most labels;
- Ambiguity amongst labels: Properties that leave broad scope for interpretation when jurisdictions apply them, so different jurisdictions might reach different decisions when considering the same evidence;

- Differences amongst labels: Properties that appear to be mentioned in some foundation documents but are not present in others; and
- Properties that are present but referenced in substantially different ways across labels.

Scoring the language used in the Decisions was relatively straightforward in most cases. However, some scores were not appropriate for some tables, because of the nature of the property being scored. The tables differentiate among cases when there are:

- Strong similarities: Nearly the exact words of the property in the row being scored were in a provision of the Decision or foundation document (Score with a +);
- Complementarity: The row property appears clearly intended by Decision or foundation document, but the exact phrasing of the respective row was not used (Score without a +); or
- Inferred complementarity: When the specific property of the table row was not referenced in the Decision or foundation document, but logically would have to be present for other provisions in the Decision to have a required status [Score of I (= Inferred) in the tables].

**Table 1** presents a full explanation of each score for each theme.

These results will not prevent debates among various jurisdictions, interest groups, and perspectives about what types of aquatic areas deserve enhanced efforts at conservation of biodiversity and the types of measures that might be appropriate for specific Special Places. However, they may provide an objective basis of common information that can inform such discussions, and clarify when extrapolation of properties from one label to another may be appropriate, or not.

## RESULTS

Substantial commonalities (similarities and complementarities) and some noteworthy differences among both labels and the individual properties of Special Places emerge across the five themes examined in this review. These are presented singly first (**Tables 2–6**), and then the implications of the amalgamated findings are explored in the Discussion section.

**TABLE 2** | Biological and Ecological Properties tabulated by explicitness and clarity of inclusion in the foundation documents for each acronym. Scores and abbreviations explained in **Table 1**.

Bio-Ecological Properties	OECM	VME	EBSA	KBA	APEI	PSSA	LMMA
Biodiversity values present (generically)	N+	I	S+	S+	S+	N_N+	
Importance to threatened or endangered species	C+	S+	S+	S+	S+	I	
Importance to threatened or endangered habitats	I	S+	S+	S+	S	S	
Rarity of species or habitats	C+	S+	S+	S+	C	S+	
Importance to specific life history stages/processes		S+	S+	S+		S+	
Representative biodiversity	C+		S	S	N+	S+	
High Productivity Areas		I	S+	I		S+	I
Vulnerability of area considered	C+	S+	S+	I	N+	N=	N=
Ecosystem functions and services	C+	C+	C	C		S	I
Regional biogeographic importance	I		I	I	N	S	

The \* for LMMA indicates scoring in all tables was based on presence or absence of community based practices comparable to the processes or actions used in top-down governance to deliver the intent or outcome of the property.

**TABLE 3** | Functions intended to be served by either the area or the measures used, tabulated by explicitness and clarity of inclusion in the foundation documents for each acronym.

Functions served by the area or measures used	OECM	VME	EBSA	KBA	APEI	PSSA	LMMA
Provide conservation benefit	N+	N	N+	N	N=	N	N
Opportunity for long term biodiversity conservation	N+	N	N	N	I		N+
Incentive for positive actions	N+	I	N	I	I	I	N
Connectivity	C+		C+	C	C+	I	
Resilience	C+	I	S+	S	C	I	I
Contribute to Equity	C+						N+
Protect Representative Ecosystems/biota	C+		C	C+	N+	D	I
Mainstream biodiversity into relevant sectors	N+	I	I	I	I	N	I
Contribute to landscape scale conservation	C+	I	S	S	N	C	I
Intact ecosystems valued	I		I	S	S	C	C
Contribute to other Targets than conservation	C+		I	C	C	C	C+
Support decision-making for other purposes	C+		I	C		C	C+
Facilitate dispersal of animal populations			C		N		
Increase well-being of nearby people	C+					S	N+
Promote recovery if required by population or ecosystem	N+	N	S				N
Serve as reference zone for impact assessments				I	S	C	

Scores and abbreviations explained in **Table 1**.

## Biological and Ecological Features

Commonalities are well represented in the biological and ecological features theme (**Table 2**). All labels have the presence of substantial biodiversity values as a necessary, and often sufficient, condition for positive status determination. Although this is only implied in the VME Decision, the list of specific biodiversity properties listed as individually sufficient for a positive VME status determination make the “Implied” a sound endorsement of having high biodiversity values. Listing of possible specific justifications for a positive status determination for any of the labels shows almost universal

agreement on high priority features of biodiversity. Importance for Specific Life History Features, High Productivity areas, and areas of Regional Biographic Importance are only implied or not referenced explicitly in slightly more cases than the other biological and ecological features. However, this could reflect a lesser degree of splitting ecological properties rather than differing intent, because areas of high productivity or important to specific life history functions of particular species are likely also be rated highly when applying other selection criteria that are explicit in the label-specific Decisions. Areas regionally important for biodiversity are also areas likely to be

**TABLE 4** | Governance properties and processes tabulated by explicitness and clarity of inclusion in the foundation documents for each acronym.

Governance properties and processes	OECM	VME	EBSA	KBA	APEI	PSSA	LMMA
Governance supports processes to identify and document biodiversity features	N+	N+	D	I		N+	N
Governance supports processes to identify and document social and cultural features	N+		D			N+	N
Inclusive governance processes	N+		D		N	N+	N+
IPLC self-regulation and consent	N+		N			D	N+
Accommodate multiple levels of legitimate governance processes	N+		N+	I	N	N+	N
Use best available science	N+	I	N	I	I	N	
Use other knowledge systems (Indigenous Peoples and Local Communities)	N+		N	I		N+	N+
Status relative to MPAs specified	N+		D	D			
Management plan or system exists/in development	N+	N+			N+	N+	N+
Management integrated inside and outside area	N+	I			N+	N	N
Monitoring systems in place	N+	I		C	N	I	I
Assessment/feedback processes in place	N+	N		C	I	I	N
Processes respect cultural practices	I	P	I		I	I	N+
Communities involved in monitoring and evaluation	D+			I			N+
Monitoring of social processes and benefits	D+					I	I
Processes to ensure periodic reviews and reevaluations	I	I	I	I	I	N+	I
Dependent Community values respected	N+		I		I	D	N+
Site vulnerability assessed and considered		I	C	C		N+	

Scores and abbreviations explained in **Table 1**.

**TABLE 5** | Management of threats and pressures occurring in or necessary to be implemented in the areas, tabulated by explicitness and clarity of inclusion in the foundation documents for each acronym.

Threats and Pressures (Managed or present)	OECM	VME	EBSA	KBA	APEI	PSSA	LMMA
Opportunities to remove or reduce pressures/ threats	N+	N+	D	D	N	N	N
Consistent with Precautionary principle and/or Ecosystem approach	N+	I	N+		N		O
Management effectiveness established (absolute or comparative)	N+	I				N+	I
Measures to support some biodiversity features don't degrade others	N+					D	I
Only specific activities excluded or managed tightly	N+	N=		U	N+	N+	
Specific measures identified for specific purposes	N+	N+		U	N+	N+	I
Contribute to/strengthen spatial networks	D+		D	D	D		
Consistent with existing legislation	N+		N+			N+	N
Positioned to avoid conflicts where possible		P			N	N	I
Jurisdiction has the legal competence to apply or require the measures	N+	I	N		N+	N+	N+

Scores and abbreviations explained in **Table 1**.

considered important for high overall biodiversity value (row 1, **Table 2**) and for having representative biodiversity, so few are likely to be overlooked in sound applications of labels lacking an explicit “regional significance” criterion.

Two columns (labels) stand out from a general endorsement of most criteria as comparatively appropriate for positive status determination: APEIs and LMMAs. The APEI guidance gives habitat features much more explicit importance than population and local ecological community features. As the reference documents make clear, the APEI criteria emphasize features most likely to be available in assessments. This is consistent with the data and information sparseness in many parts of the deep ocean where deep-sea mining concessions have been awarded or are being considered. On each spatial scale from local to hundreds of km<sup>2</sup>, habitat features are more tractable to delineate than species composition or dynamics of the populations in these deep-sea areas, although again they are likely to be positively correlated (Hewitt et al., 2008; Vassallo et al., 2020).

LMMA determinations do not explicitly recognize most of the biological and ecological features given priority by the other labels. This possibly reflects the very different governance status of LMMAs; Inherent in the concept of LMMAs are the use of local community knowledge and the right of communities to identify features of nature important to their well-being (Gilchrist et al., 2020). There is ample evidence that when efforts of communities in the LMMA network to identify areas of importance are acknowledged and supported, communities are well aware of the value of areas of high productivity, representative biodiversity, special habitat features, and the life histories of key species in the ecosystems, and give such areas careful consideration in planning their activities in the LMMAs (Govan et al., 2009; Cinner et al., 2012; Cohen et al., 2014; Kawaka et al., 2017; Gilchrist et al., 2020). When contrasted with other labels, this does leave a potential weakness in areas identified as warranting enhanced risk aversion in management, as areas important to globally or regionally rare or endangered species and habitats are not explicitly prioritized.

**TABLE 6** | Other considerations addressed in the foundation documents for each acronym, tabulated by explicitness and clarity of inclusion in the foundation documents for each label.

Other Considerations	OECM	VME	EBSA	KBA	APEI	PSSA	LMMA
Ability to adapt to future changes/new threats	N+		I	B	N+	D	N
Effectiveness demonstrated to be comparable to or better than effectiveness of alternative approaches						N+	
Coverage of areas evaluated and found adequate to achieve objectives for the area		N+	I	D	N+	N	N+
Size and boundaries are specified	N+	N+	N	I	N+	N+	N+
Baseline data are available	D+	I	D	I	N	N	I
Benchmarks identified for species and/or ecosystems		I	D	D		N	I
Coverage optimizes benefits				I	N+	I	I
Use of buffer zones considered		D+			N+	N	I
Replication of areas within network					N+		
Guidance on what to do when regulations are violated		N+				N+	I
Documentation of basis for status decisions required and made available	N+	N+	I	I	N	N+	I
Impacts on other uses and activities considered			I	D		N+	N
Take account of implementation capacity	I	P				N+	N+
Intents of designation specified and breadth appropriate for effective conservation	I			U	N	N	I
Other measures to support their effectiveness	N+	I		D		D	D+

Scores and abbreviations explained in **Table 1**.

## Functions Served by Areas Receiving Enhanced Risk Aversion in Management

When the functions served by areas receiving enhanced risk aversion in management are considered (**Table 3**), many more features are optional in the sense that they can contribute to a positive decision if present, but their absence does not reduce likelihood of a positive decision if other appropriate features are present. Also functions served, often are implied but not explicit. Our review also found larger differences among the labels in how such functions are considered. All labels include provision for some form of conservation benefits as necessary for positive status determinations. For all but PSSAs, there must be an expectation that the benefits will persist for the long-term. The reason for absence of reference to long-term consequences for PSSAs cannot be resolved without more in-depth investigation. It might merely reflect that the determination of areas as PSSAs focuses on avoiding accidents such as ship strikes and spills, which are inherently episodic, rather than on avoidance of impacts of shipping on the seabed, which is already inherent in safe navigation, and optimal positioning of built infrastructure that alters marine habitats. Shipping does require substantial built infrastructure in near-coastal areas, but many tools and regulatory frameworks already are available for such coastal infrastructure (c.f. Ports & Harbors <https://www.iaphworldports.org/pandh/>), and PSSA determination might be considered to provide few incremental benefits on managing associated threats to biodiversity. However, there could be additional considerations in play, and study of the dynamics of PSSA identification processes might be needed to clarify the reasons why PSSAs do not require expectation of long-term conservation benefits.

Considering additional functions intended to be served by the various Special Places, most of the labels acknowledge at least three quarters of the specific functions in **Table 3**, with VMEs and APEIs as the marked outliers. The UN Decision at the root of VMEs does not discuss ecosystem or socio-economic functions of areas designated as VMEs, although the text that sets the standard of VMEs not being exposed to “significant adverse impacts” does not restrict the relevant impacts solely to impacts on structural properties of marine seabed to the exclusion of functions served by the structures. Consequently, such impacts are not excluded from consideration in VME status determinations. For APEIs, the functions not mentioned or inferred in the Guidance are partly related to roles of APEIs in governance of deep-sea mining and partly related to ecological functions often being particularly difficult to document in the deep-sea areas where APEI determination is undertaken. However, even though decisions regarding most other labels do acknowledge or imply it is appropriate to consider most of the functions listed in **Table 3**, in barely a third of the labels are the presence of individual functions necessary or sufficient for positive status determination. This is in marked contrast with the Biological and Ecological Features theme, where ‘Necessary’ and ‘Sufficient’ scores outnumbered ‘Considered’ or ‘Implied’ by more than 3 to 1.

A few functions were rarely addressed explicitly in the foundational agreements of the assessed labels. This included

functions of the area for population dynamics (facilitate dispersal and promote recovery of depleted populations), which could have been considered to have been addressed adequately by more generic functions that were included. Other functions sometimes missing concerned either roles in governance (support decision-making, facilitate achievement of other objectives, serve as assessment benchmarks); where documents establishing VMES and APEIs, in particular, do not call for functions directly supporting decision-making, or human well-being. Those functions, in particular, stand out as a major difference of OECMs and LMMAs relative to all the other labels, as both the latter give particularly high priority to areas contributing to human community well-being and to equity, at least at the scale of those whose livelihoods would be directly affected by the management measures applied in the area. The absence of mention of equity and human well-being in the other foundational documents highlight one important way that labels can differ in important considerations, and are not just all minor variants of a commonly shared vision of Special Places.

## Governance

The largest number of factors that were common and distinct enough to score were related to Governance, which was also addressed in quite different ways among the labels (**Table 4**). Here four of the seven foundational documents (for OECMs, EBSAs, PSSAs and LMMAs) included substantial guidance or standards for governance processes. The documents typically specified that processes had to be supported (and developed if necessary) for identifying and documenting biodiversity, other environmental, social, and economic features of candidate Special Places and for managing those that are accepted (even when the bodies selecting and applying the management measures may not be the bodies making the decision on status relative to the label); and that these processes have to be inclusive, participatory and take into account legitimate roles of multiple levels of governance (and government). For areas to be identified and managed under any of these labels, arguably such processes must exist. Therefore, the fact that some jurisdictions nevertheless spelled out substantial guidance on them in the foundation documents may reflect the importance these jurisdictions attach to how Special Places are identified, gain acceptance and managed for enhanced biodiversity conservation, not just which areas are chosen.

There are very few noteworthy differences among the subset of labels that do lay out expectations for governance. The absence of any clear calls for best available science for LMMAs is consistent with the community-based focus of LMMAs, and the concomitant requirement that regardless of how little or much “science” is available, community knowledge should be prominent in status determinations for LMMAs, and that community values must be respected. This emphasis on community-based governance processes in LMMAs carries on for several other governance features, including support for processes that document social and cultural values of areas under consideration, and takes those values and community

knowledge and capacities into account in management, monitoring and evaluation of the biodiversity in LMMAs.

The EBSA Decision has substantial guidance on governance aspects for their determination, but is silent on how management should be governed once an EBSA is recognized. This is consistent with an intent by the CBD to ensure EBSAs are determined to appropriate standards, but also acknowledge the rights of many different jurisdictions and governance processes in applying the provisions of the Decision. On the other hand, the Decision for VMEs lays out several expectations for how jurisdictions are to avoid serious adverse impacts on VMEs, but does not instruct Regional Fisheries Management Organizations (RFMOs) and other fisheries bodies (e.g., national fisheries authorities) how to undertake site determinations.

The foundation documents for KBAs and APEIs have markedly little content on governance. For APEIs this could be because the International Seabed Authority is the only authority likely to identify APEIs, and its existing governance processes were taken into account by those developing the APEU guidance. This is in marked contrast to PSSAs, which has among the most numerous ‘Necessary’ and ‘Desirable’ governance features, possibly reflecting the desire for great clarity in how authorities, at levels from national to individual cities, are expected to implement PSSAs both within national jurisdictions and where flag carriers operate on the high seas. In contrast, the document first establishing the concept of KBAs intended them to be a general tool for conservation of biodiversity, bringing areas important to biodiversity to the attention of a range of governance process. It was expected that a wide range of both jurisdictions and independent expert groups might preform the case by case site determinations and subsequent management. Guidance on appropriate governance processes can be found in supporting documents (IUCN, 2016), but governance processes themselves are not intrinsic to the KBA related foundational documentation.

A few of the individual scorings under Governance do warrant attention. One of the few P (prohibited) scores was given for Processes Respect Cultural Practices under VMEs. The Decision and Annex are explicit that application of the VME standards is not optional for jurisdictions, and areas that are found to meet the criteria must receive the necessary policy and management measures. Together, those two provisions impede the ability of jurisdictions to allow cultural preferences and dislikes from influencing the processes or outcomes in substantial ways. Only the OECM guidance has determining status relative to Marine Protected Areas as a necessary part of the governance processes. That reflects the intent of OECMs to be a complement to MPAs in larger scale marine conservation efforts, but for reporting relative to Aichi Biodiversity Target 11 and its GBF successors, areas with a range of properties can be reported as one or the other (MPAs or OECMs), but not both.

## Presence and Management of Threats and Pressures

The foundation documents for the labels differ most in how threats and their management influence the status

determinations (**Table 5**), although all consider it necessary or at least desirable to remove or reduce pressures on biodiversity in the area associated with the label. The labels vary substantially in their expectations for site vulnerability to be assessed and considered in status designation. Whether or not the absence of priority for site vulnerability is a weakness depends on how that absence affects implementation by the relevant jurisdictions. Should a jurisdiction manage specific pressures, and also use vulnerability of a site to those pressures as a major consideration in status determination, at least challenges could arise. Such an approach could be challenged as a weakness in the evaluation, leaving currently unthreatened sites unprotected, and vulnerable to harm from new pressures or pressures displaced from other areas. Challenges could escalate if jurisdictions were to require vulnerability assessments, with the conscious intent to ensure that areas meeting other criteria but not currently threatened are excluded from positive status determination. Such circumstances could trigger debates between perspectives concerned about vulnerability to potential future threats, and perspectives concerned about status designations incurring high opportunity costs for possible future benefits that might never be realized.

OECMs stand out on threats and their management as having all but one of the scored factors as necessary or at least desirable, consistent with OECM status determination based on evidence of both biodiversity features and that major threats to biodiversity are identified and managed effectively to provide long-term *in situ* benefits to biodiversity. The only other labels that come close to OECMs in terms of expectations about threat management are APEIs and PSSAs — The jurisdictions using each Ecologically address specific potential threats respectively (deep-sea mining and marine transportation) and are similar to OECMs in prioritizing evidence that measures are in place, are effective, and are within the competence of the jurisdictions that must apply the measures. Standards of evidence that threats are identified and managed effectively are at least much less complete, if not weaker, for EBSAs, KBAs and VMEs. VME evaluations do make it necessary to identify threats that bottom fishing may pose to biodiversity within the VME and take measures to avoid harm, but say little about the standard of evidence needed nor about how VME status decisions might be affected, either positively or negatively, by activities other than fishing in the same areas. In fact, they are specifically discouraged from taking into account the potential consequences of positive status decisions on fisheries operations and other extractive uses.

At the other extreme, positive EBSA status determinations only expect the determination and subsequent management to be consistent with the precautionary approach, and whatever legislation and competencies are held by the jurisdictions in which the EBSA is located. The foundational documents for KBAs are nearly silent on management of threats, beyond actually discouraging the initial status determination from explicit consideration of threats individually, or matching of specific management measures to identified threats. As with governance, the initial steps in KBA status determination focus tightly on biodiversity properties present and outcomes desired



with an implicit expectation that other documents by relevant sectors will provide potential guidance on how best to achieve the desired outcomes in relation to threats. LMMA guidance actually does take potential threats into consideration, but again, from a community-based perspective. The planning and management processes applied by appropriately empowered communities must have many of the features of the jurisdictions that oversee the other labels, given that the communities are striving to provide the outcomes that are priorities for them, specifically to counter recognized threats and pressures. One issue of importance is that only OECMs and PSSAs actually require evidence that the management of the threats is effective (or likely to be effective) and does not just shift harmful biodiversity impacts to other species or habitats, although for LMMA status determinations and management to proceed, those threats would have to be managed effectively as well.

## Other Considerations

The final amalgamation of Other Considerations (**Table 6**) was developed to encompass factors that did not fit readily and exclusively into one of the other tables. Some were provisions that were reasonable to consider among the full set of other labels but were not mentioned or implied elsewhere; for example i) effectiveness demonstrated to be comparable to or better than effectiveness of alternative approaches, and ii) replication of areas within larger networks of areas receiving enhanced conservation efforts. Other considerations were that information used in status determinations should be documented and made publicly available, and the boundaries and baseline status of biodiversity inside the boundaries to be specified, which might apply to information needed in any of the other themes. All but OECMs and APEIs called for or strongly implied benchmarks for successful conservation to be identified.

Several factors were expected or implied by all but a single one of the six labels: VME documents being silent on ability to adapt the management to future threats, and documents for OECMs being silent on the need to determine whether the area included in the boundaries was sufficient to meet the goals of the area receiving protection. In the case of VMEs, the requirement that VMEs be protected from significant adverse impacts can be interpreted as expecting management to adapt should, for example, new gears be adopted by deep-sea fisheries. In the OECM case, the fact that evidence of likely effectiveness is necessary for a positive status determination *de facto* should mean the area is large enough to support the desired biodiversity outcomes. However, in neither case is the body conducting the status determination actually tasked to do the specific evaluations necessary to document the flexibility of responses (VMEs) or adequacy of the area to provide the range of biodiversity outcomes expected from a well-managed area.

In fact, although demonstrating that the coverage of the area receiving a positive status determination is optimal, use of buffer zones around the core areas, having pre-identified responses to possible transgressions of the management measure, and taking implementation capacity into account when making status determinations might be widely useful but are called for or strongly implied in half or fewer of the labels. Reasoning

behind this could be varied, but acknowledges that the status of in area assets, especially mobile assets, is linked to factors active over scales larger than the likely area of designation, and therefore is potentially out of the full control of the authority. VME status determinations, in particular, are an obligation of jurisdictions managing deep-sea fisheries. If areas which meet the criteria are found, the jurisdiction must either have the capacity to manage the fisheries to prevent serious adverse impacts or not authorize the fishery to occur. The guidance associated with KBA identification similarly discourages specifying the specific intent and scope of conservation measures implemented in a KBA, encouraging a focus on the biodiversity properties that make the area important, and leaving consideration of management needs and actions for later steps in the conservation planning process.

Given the diverse range and nature of the Other Considerations, comparisons of numbers of the various scores across the labels is unlikely to provide novel insights. However, consistent with the degree of detail found for PSSAs in the other tables, and the number of properties that are implied as present in community-based governance processes at the heart of LMMAs, both PSSAs explicitly and LMMAs by implication do address all or nearly all the factors captured in the table.

## DISCUSSION

An informative pattern emerges through this comparative review of labels (**Tables 2–6**). Starting with the Biological and Ecological Features that can be used to justify positive status determinations, there are few substantive differences among those labels assessed. Even the properties that are not acknowledged as criteria for every label — specifically value for specific life history functions and areas of high productivity — are likely to also characterize areas with properties that meet other criteria, making such attributes implicit if not explicit. Moreover, many of the properties in the table are treated as ‘Necessary’ or ‘Sufficient’ for positive status determination by most or all of the labels. Even the approach for LMMAs, of allowing communities to base their priorities on community values, is likely to result in attaching high importance to areas that possess many of the properties in **Table 2**. This is reassuring from a conservation perspective, because, when different sectors apply spatial approaches to addressing their biodiversity impacts, areas with important biological or ecological features are likely to be identified as priorities by jurisdictions associated with any of the labels.

Similarity and complementarity across the theme of biological and ecological features provides an opening for efforts to integrate and catalyze management actions across sectors leading their own form of Special Place management. Examples of this include cases of collaboration of ENGOs with local communities that has resulted in rare or endangered species or habitats also being given special consideration in many LMMA initiatives, which bridges even the possible gap in similar bio-ecological priorities across the labels (e.g., Mills et al., 2011; Gilchrist et al., 2020). However, such collaborations may not be universally appropriate strategies, if

funding and human resources brought in by the NGOs are used to promote the organization's own priorities ahead of a community concerns for livelihoods, food security and cultural practices as part of their interest in biodiversity conservation.

Differences do appear when considering the functions that the various forms of Special Places are supposed to serve. There are relatively few differences among labels in the ecosystem and population dynamics functions used as criteria. The exceptions are the VME and APEI status determinations, which do not focus on population and ecological functions, possibly as they are difficult to document in the deep-sea areas for which both labels were developed. The differences among labels are much more pronounced when considering functions the Special Places provide for humanity. Only LMMAs and OECMs treat functional significance to people of comparable importance to ecosystems. The contributions to decision-making from positive status determinations for particular places is at most a secondary consideration in most labels, if it is mentioned at all in the foundation documents. This is an important point as equity for people has been identified as a critical property for achieving robust and lasting compliance in prosecution of biodiversity conservation initiatives (Jonas et al., 2020; Bennett et al., 2021)

Differences become much larger in how both governance and threat management are treated among labels. Many of the differences in how governance and threat management are treated may reflect differences in the competencies of the jurisdictions that developed the respective foundational documentation. However, this is an incomplete explanation for the sources of the differences. The guidance on governance and threat management in the foundation documents is most explicit and detailed for OECMs and PSSAs, even though OECMs were intended to be used by any jurisdiction and PSSAs were intended very specifically for authorities managing marine shipping. A possible explanation of the comparatively greater guidance on governance and threat management is that for OECMs, the jurisdictional bodies likely to apply the criteria identify areas warranting greater risk aversion may not be the bodies that adopt and apply the spatial conservation measures. This hypothesis requires further investigation, but could be a consideration of broader relevance than just spatial approaches to conservation.

The Other Considerations most closely related to properties of individual sites being evaluated, such as having adequate coverage of the ecosystem features intended to receive enhanced protection, clearly delineated boundaries, baseline data and benchmarks, are all present in some way in at least 2/3 of the labels. In contrast, the majority of properties of the processes intended to conduct the evaluations and management are much less universally addressed in the foundation documents of labels.

Even in cases where the differences among labels can be justified, they nevertheless might have consequences for actions by jurisdictions and associated outcomes. The actions and outcomes following a positive status determination could either be required to commence as rapidly as feasible, or the positive determinations could trigger prolonged, polarized, and contested consultation and decision processes that might delay actions by jurisdictions (Johnson et al., 2014; De Santo, 2017; Kubota and Kusumoto, 2020; Shiono et al., 2021). More systematic studies that

follow the nature and timetable of governance and management actions triggered by positive and by negative status determinations would be valuable in making most effective use of these approaches to providing enhanced conservation for Special Places.

Although interesting and possibly informative, these patterns amongst properties of labels need to be interpreted with caution. A lack of scores in cells does not necessarily mean that the property is not present in some way. Rather it indicates that every jurisdiction choosing to implement each label, from local to global, has greater freedom to interpret the label according to the institutional and sometimes human cultures involved in the implementation. The absence of a specific property in the list of criteria could simply reflect an institutional culture that already has such features imbedded in its business-as-usual approach and may consider it unnecessary to specify the same features in individual decisions of the institution. On the other hand, the absence of specific properties in the criteria could reflect inability of the jurisdiction to find consensus on the property. This suggests the property could be contentious well beyond its role in identifying Special Places. Either possibility could be a factor in fewer of the foundation documents making reference to properties like specifying management responses if regulations in a Special Place are violated, and taking impacts on other uses of the area into account in status determinations.

Some properties that are widespread as best practices in most jurisdictions, such as assessing the adequacy of the area to receive enhanced protection and institutional transparency through providing complete documentation of decisions (Richards et al., 1996; Gaymer et al., 2014; Bull et al., 2017; DiGregorio et al., 2020; Owusu et al., 2020). They are either explicitly included or strongly implied in most of the label foundation documents. We are seeing that whatever the causes of the differences in attention to properties among the approaches, the relevant jurisdictions gain experience as individual cases are evaluated. This experience is often consolidated into updated additional guidance, and that guidance can become at least as influential on practices as the initial Agreement or Decision was when the label was first adopted. Many other contributions in this volume illustrate cases of such developments in label applications as experience with each label grows.

This may be another aspect where this review has found that there is no "best way" to set criteria intended to result in consistent outcomes. Failing to specify in guidance documents properties that the originating body already has established as routine best practices for its activities can leave concerning voids, if other bodies with their own institutional practices critically assess the approaches of others, or if they adopt and apply criteria without contextual understanding. However, embedding substantial detail in guidance means that the guidance needs to be regularly updated to keep up with evolving practices and growing knowledge. Cases in the literature illustrate both the value of 'learning by doing' as advocated by the Addis Adaba Practical Principle 4 <https://www.cbd.int/doc/publications/addis-gdlen.pdf> and others (see Knight et al., 2006; Grantham et al., 2010; Roux et al., 2016) and the risk that when expectations are not laid out clearly, differing perspectives can produce differing guidance on implementation

of a single label (IUCN, 2019). This can allow partisanship that the initial Agreement or Decision was intended to resolve to resurface at each opportunity for implementation. Our finding that even the need for evidence, let alone the standard that evidence would have to meet, varies substantially across approaches. The foundation documents for the various labels differ greatly in how they treat the matter of what can constitute evidence, highlighting opportunities for both the divisions that Agreements and related documents were intended to resolve to resurface and for new sources of disunity to surface.

The evolution of practice using each label highlights the value of occasional performance reviews not just of individual areas undergoing status determinations under any label, but also of the foundational Agreements or Decisions. Performance reviews can provide insight into both the effectiveness of the provisions in the Agreements and Decisions and how evidence is acquired and used to inform their application. These performance reviews, considering the themes reviewed here, could facilitate learning from a broader range of experiences with area-based conservation measures, and lead to proposals for revisions or augmentation of provisions to address shortcoming in performance of each label. Any Party to the original agreement has scope to voluntarily improve its practices within the interpretational “space” provided in the original Agreement. However, for revised or additional provisions to also be incorporated into Agreements and Decisions, whether binding or voluntary, they must also be adopted in a Plenary or other appropriate institutional process, not just promoted by experts or Parties with experience to share.

## CONCLUSIONS

Looking at the patterns this review and assessment consolidated across jurisdictions, one of the initial concerns of this paper can be addressed directly. If one specific area is found to meet the biological and ecological criteria of its jurisdictional body, it is likely that it would be consistent with the corresponding criteria for any of the other jurisdictions as well, sometimes on the basis of exactly the same properties and in other cases possibly in combination with additional biological and ecological features. That relative legitimacy of generalization among labels largely, but not wholly, extends to the functions served by the area being evaluated. This is often valid for ecological and population functions, but less often for social and economic functions. However, it is in the Governance and Threat Management and Other Considerations (issues that speak to modes of implementation) that differences among labels are more prominent. Consequently, when a specific area is found to meet the criteria for any single label, it should be viewed as particularly appropriate for evaluation by jurisdictions using the other labels. However, the differences among labels in all the other factors mean that generalization of the status determination from one label to others is less likely to be legitimate without case-by-case consideration of the full range

of biological, ecological, social, economic and governance factors against the jurisdiction-specific standards.

The differences emerging from comparison among labels also highlight opportunities to strengthen individual Decisions and Agreements. Adding provisions approved by the respective Plenary (or comparable body) where empty cells occur in the tables might improve performance of all the labels, and their interplay, whereas at present additional considerations are explicitly called for in only a few of them. Candidates to consider include factors such as:

- Assessing optimality of coverage of the area and effectiveness of measures implemented in the areas;
- Seeking measures that do not just displace conservation challenges to areas outside the Special Places (often less able to meet them);
- Use of buffer zones around the core areas;
- Having pre-identified responses to possible violations of the enhanced measures; and
- Taking implementation, assessment and management capacity into account when making status determinations.

The distinct features of the LMMA guidance in each table are a noteworthy source of contrasts with the other labels that could be sources of additional provisions to improve practices. Although LMMAs do not explicitly prioritize areas important for globally or regionally rare or endangered species and habitats, they do acknowledge that local communities often have deep familiarity with the ecosystems on which they have depended often for many generations (<https://ipbes.net/indigenous-localknowledge>). OECMs also stand out as a label that deals fairly comprehensively with all the considerations reviewed.

Ensuring that areas are used and managed in ways consistent with local community or sectoral knowledge might be a strong foundation for positive biodiversity outcomes, as well as strong or improved well-being of the human communities dependent on those area, whether top-down governance dominates or communities are recognized and supported as needed for effective self-governance. In addition, when ENGOs and other interests form partnerships with local communities, such partnerships can use the financial and capacity-building potential of the ENGOs to support projects that benefit the most threatened biodiversity factors in ways in harmony with community practices and values.

If the inter-community dialogue is grounded in transparency and equity, such combination of interests may generate positive outcomes from all perspectives, rather than imposing the trade-offs featured in the narratives of many of the label documents. This would also address the conspicuous absence of the mention of equity and human well-being in most or all the other originating Agreements and Decisions. Even if equity is the only priority property to be adopted as a binding goal by the jurisdictions that are sources of the other labels, it would be a meaningful step towards an overarching objective already globally endorsed in the UN Universal Declaration of Human Rights (<https://www.un.org/en/aboutus/universal-declaration-of-human-rights>), the CBD and

SDGs, and many other overarching agreements. However it is a property conspicuously lacking in the determination and management of areas in need of enhanced conservation and sustainability of use of biodiversity.

## DATA AVAILABILITY STATEMENT

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

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## AUTHOR CONTRIBUTIONS

JR coordinated preparation of the manuscript, and the bulk of initial drafting. All co-authors participated in selecting the documents to be used as original sources for each type of area identification, selection of properties to evaluate, and scoring of the various types of spatial conservation and management approaches against the selected properties. All authors edited the draft manuscript through multiple cycles of improvements. All authors contributed to the article and approved the submitted version.

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