Report of the Global Ocean Biodiversity Initiative international workshop on ecologically or biologically significant marine areas (EBSAs) in areas beyond national jurisdiction

6-9 November 2022
Santa Cruz, California

Supported by:

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IKI INTERNATIONAL CLIMATE INITIATIVE

GOBI Global Ocean Biodiversity Initiative

based on a decision of
the German Bundestag

This report is a summary of the international workshop on Ecologically or Biologically Significant Marine Areas (EBSAs) in Areas Beyond National Jurisdiction (ABNJ), convened by the workshop Report of the Global Ocean Biodiversity Initiative (GOBI) in Santa Cruz, California on 6-9 November 2022.

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Introduction

1. The Convention on Biological Diversity has spent a decade (2011-2021) describing special places in the ocean[1]. An overview presentation by Prof. Daniel Dunn (University of Queensland) explained the origin and drivers of the Convention on Biological Diversity (CBD) process for describing ecologically or biologically significant marine areas (EBSA), its scope and how the process has evolved over time. Application of the EBSA criteria, including considerations and examples for each criterion, was set out by Jesse Cleary (Duke University). This underlined that assessment of an area against the criteria is relative to other areas in the general region under consideration, no thresholds are applied, the exercise is scale-dependent, and areas may meet multiple criteria. Over the ten-year period of application a spatial typology has also evolved, adding precision to EBSA definitions and helping to clarify what tools and technologies may be needed to monitor the ecological condition and human uses at these sites[2].

2. The genesis of the EBSA process and EBSAs in ABNJ within the current CBD EBSA portfolio was presented by Prof. Daniel Dunn based on a 2019 review document[3] and subsequent additional analyses. Geographic gaps were highlighted: of the 321 EBSAs described, 10.3% are solely in ABNJ and 22.3% have at least some area in ABNJ. However, the 10% in ABNJ make up 34.5% of the total area covered by EBSAs globally, and the 22% with at least some area in ABNJ make up 85.7% of the total EBSA area. Notwithstanding this analysis confirming that most EBSAs in ABNJ are large, the size of EBSAs in ABNJ can be deceptive as they sometimes cover large dynamic features (i.e. only part of the area is significant at any one time). Similarly, although there is a high proportion of dynamic or ephemeral EBSA descriptions, major gaps remain – both for biogeographic regions and by ecosystem type. EBSAs described within single or multiple national jurisdictions could be subject to appropriate management measures but management opportunities are very limited for ABNJ, where existing governance of biodiversity conservation is currently piecemeal, patchy and incomplete.

3. While much of ABNJ is under-explored and under-sampled, Regional EBSA Workshops have been supported by data reports (compiled by technical teams appointed by CBD Secretariat – MGEL Duke University and CSIRO Australia) supplemented by additional data, maps and scientific references provided by workshop participants. Jesse Cleary presented an overview of relevant data

[1] Secretariat of the Convention on Biological Diversity (2021) Special Places in the Ocean: A Decade of Identifying Ecologically or Biologically Significant Marine Areas. 68 pages. https://www.cbd.int/marine/ebsa/booklet-ebsa-impact-en.pdf

[2] Johnson et al. (2018) Reviewing the EBSA process: Improving on success. *Marine Policy*. DOI: 10.1016/j.marpol.2017.11.014

[3] Dunn DC, J Cleary, S Deland, C Barrio Frojan, G Ortuno Crespo, C Curtice, V Gunn, CY Kot, DE Johnson, PN Halpin (2019) A Review of Ecologically or Biologically Significant Marine Areas (EBSAs). Commissioned report to the Secretariat of the Convention on Biological Diversity.

sources (data sources and map products) and explained that in CBD-sponsored workshops technical teams provide live GIS support to help the scientific and regional experts with workshop mapping needs such as boundary creation or revision, as well as providing access to a dataset archive from previous workshops.

4. This international workshop, convened by the Global Ocean Biodiversity Initiative (GOBI)[4], provided an opportunity to undertake an independent expert review of EBSAs in ABNJ. It was not a CBD workshop and experts attended (in person and online) by invitation. The premise for the workshop was that expert opinion on opportunities for updating information on features in the deep sea is important, and consideration should be given to new areas that may meet the EBSA criteria if new targets for protected areas and the conservation and sustainable use of biodiversity beyond national jurisdiction are to be met. This should be informed by best available science, and options to take the process forward should be explored. Using standard EBSA templates and the EBSA criteria to frame discussions, the workshop collectively scoped and considered examples of potential new areas in ABNJ that may meet the EBSA criteria.

Opportunities

5. The workshop supported the need for continuous updating of EBSA descriptions, noting reasons cited at the CBD 2017 Berlin 'EBSA next steps' meeting[5]. These included where new data have become available; new regional expertise and knowledge has been identified; new analysis methods have been identified; new EBSA classifications or categories have been promulgated; sufficient time has passed that an update appears to be prudent, or if the area has experienced significant environmental change. As an example, this logic prompted a review of the **Sargasso Sea** EBSA, 10 years on from when it was originally described at the 2012 CBD Regional EBSA Workshop for the Wider Caribbean[6]. David Freestone (Sargasso Sea Commission) provided a summary of the new analysis, confirming that the Sargasso Sea continues to meet the seven EBSA criteria, and the categories awarded by the CBD in 2012 are still valid. Whilst the algae species *S. fluitans* and *S. natans* can no longer be regarded as rare or unique to the Sargasso Sea, the wider definition of unique or rare (endemic species, habitat or communities) still holds true. The North Atlantic gyre with its central oligotrophic water mass and *Sargassum* communities remains intact – and it may be that if the causes of the present mass blooms are brought under control (for example by reducing terrestrial run-off), the *Sargassum*-based ecosystem within the Sargasso Sea will remain unique and iconic.

6. The **Costa Rica Thermal Dome** was reconsidered as an example where new information supports description of a much wider persistent dynamic area, with seasonably variable boundaries, under the EBSA criteria. Originally entitled the 'Upwelling of Papagayo and adjacent areas EBSA' by the Eastern Tropical and Temperate Pacific CBD Regional EBSA Workshop in 2012, a more extensive area (with a core of 55,000km^2 and a maximum extent of approximately 1,515,000 km^2) would incorporate new information deriving from processes defining Important Marine Mammal Areas (IMMAs) and Important Shark and Ray Areas (ISRAs). Pronounced and regular upwelling leads to high levels of productivity and provides a unique offshore habitat for marine megafauna in the Eastern

[4] Johnson et al. (2018) The Global Ocean Biodiversity Initiative: Promoting scientific support for global ocean governance. *Aquatic Conservation*. DOI: 10.1002/aqc.3024

[5] Convention on Biological Diversity (2017) Report of the expert workshop to develop options for modifying the description of ecologically or biologically significant marine areas, for describing new areas, and for strengthening the scientific credibility and transparency of this process Berlin, 5-8 December 2017. www.cbd.int/doc/c/6ac0/03a0/d4179dfc152efaeefd81d35e/ebsa-em-2017-01-03-en.pdf

[6] Roe et al. (2022) The Sargasso Sea High Seas EBSA after ten years: Is it still relevant and how has it helped conservation efforts? *Frontiers in Marine Science*. DOI: 10.3389/fmars.2022.821182

Tropical Pacific. In particular, endangered blue whales migrate to the area to feed and reproduce, and the area is an important reproduction area for vulnerable silky sharks. Large aggregations of striped dolphins, common dolphins and pygmy beaked whales and sharks and rays including thresher sharks, hammerhead sharks and mobula rays have been observed, and the Dome generally supports a high diversity of marine megafauna (10 marine mammals are regularly present in the area in addition to the four mentioned above, as well as 18 species of sharks and rays, of which 16 species are threatened). This new information would support a re-evaluation of two criteria (biological diversity and naturalness) for which no information was previously available in a new enlarged area. Further research is needed to establish bentho-pelagic associations and the relevance of El Nino/Southern Oscillation phases.

7. The CBD North Pacific Regional EBSA Workshop held in 2013 noted that datasets for the North Pacific that could inform future efforts to evaluate this region using the EBSA criteria were not available to the workshop. The same workshop also noted the on-going work of the North Pacific Marine Science Organization (PICES) to better understand critical processes in the North Pacific. An area not previously considered is the **Shatsky Rise**, one of the largest oceanic plateaus in the North-West Pacific. In terms of uniqueness, attention was given to a new type of loriciferan larvae (a phylum of minute animals living in marine sediments)[7] and new fossil species of ostracods discovered on this feature. However, it is uncertain whether confidence in rarity is genuine or a reflection of under-sampling. The potential for genetic information to inform the EBSA process was also discussed, and the Japanese national EBSA process includes representativeness or typicality as an eighth criterion, which was also relevant in this case. Future scientific cruises could target this area.

8. The abyssal plain is generally under-represented in the EBSA portfolio. The **Clarion Clipperton Zone** in the central Pacific is one area where research has been accelerated by scientific efforts to inform the International Seabed Authority.[8] In this area, seafloor polymetallic nodule fields form a unique mosaic habitat with the nodules acting as a keystone structures, increasing local seabed complexity. Species richness is substantial, with some of the most biodiverse benthic assemblages (across all size classes) in the abyss and deep-ocean. The deepest dwelling known species of incirrate octopus associates with nodules, brooding eggs on the stalks of dead sponges attached to nodules in water depths of >4000 m. It is difficult to highlight any one specific area within the CCZ as evidence suggests rare species dominate diversity for nearly all faunal size classes/groups sampled, but species ranges are well resolved. The broader CCZ region encompasses multiple habitat types and benthic communities vary in their composition and abundance at different spatial scales. Additionally, threatened endangered or declining species of turtle, cetaceans, sharks and seabirds are known to frequent the area. The workshop did not have time to source any evidence of benthopelagic coupling (although there is evidence of large aggregations of fish at abyssal depths) or to discuss the merits of whether the whole CCZ or a mosaic of representative areas (perhaps based on nodule density) might achieve the strongest justification in terms of spatial scale against the EBSA criteria and in comparison to nodule fields elsewhere.

9. Working groups had an extensive discussion about seamounts, recognising that these features can exhibit a higher diversity relative to adjacent areas, but disagreeing about how to establish a relative level of significance (i.e. importance of the whole complex versus that of discrete parts). Three groups of seamounts in the Pacific Ocean, not previously described as EBSAs, were considered as follows:

a. **Musician Seamounts**: A chain of some 25 seamounts located north of Hawaii that was highlighted as an area for future consideration by the CBD North Pacific Regional Workshop

[7] Neves & Mobjerg (2014) A new type of loriciferan larva (Shira larva) from the deep sea of Shatsky Rise, Pacific Ocean. *Organisms Diversity & Evolution*. DOI: 10.1007/s13127-013-0160-4

[8] International Seabed Authority (2019) Deep CCZ Biodiversity Synthesis Workshop, Friday Harbor, Washington, USA, 1-4 October 2019. 206 pages.

in 2013. These seamounts are some of the oldest structures in the central Pacific. New information, gathered as part of the NOAA *Okeanos Explorer* high-resolution visual survey in 2017, provides some evidence of dense coral aggregations, possibly serving as a pool of genetic diversity for deep-sea coral populations around the Hawaiian Islands. These populations included high densities of large octocorals, especially bamboo corals, known to be fragile and extremely long-lived (hence highly vulnerable species). The seamounts are also thought to be a refuge for transient fish populations.

b. **NW Pacific Seamounts**: Comprising three groups of tall seamounts (Marcus Wake, Magellan and Marshall), it was suggested that the density and age of these features is exceptional, thus likely supporting rare long-lived and specialised species. The cluster of multiple seamount chains, rising from the East-Marianas Deep (one of the deepest areas in the world), includes very biodiverse habitats (high habitat heterogeneity), with potential for isolated metapopulations and aggregations of pelagic predators, many of which are threatened or endangered. Research questions remain about connectivity, ocean circulation and species distribution. All or part of the complex may qualify against the EBSA criteria.

c. **Foundation Seamounts**: A 1400 km-long, east–west oriented chain comprising over 60 seamount features in the South Pacific set in three discrete geological sections. The seamount chain is isolated east–west from other Pacific Island chains but with links to the Antarctic. As a consequence very high and proven endemism for key species (uniqueness) and very restricted distribution within and between seamounts (importance for life history) specifically meet EBSA criteria. The very localised endemism (3 seamounts only) of a species of rock lobster demonstrates a unique ecology. Evidence supporting these assessments was drawn from exploratory trap fishing data. Different options influencing the spatial scale of any new EBSA were postulated: limiting the EBSA to known endemic taxa seamounts; expanding the area to encompass other habitat types and uncertainty in distribution, or broadening to a 'network' concept of habitats and areas.

10. **Hydrothermal vent fields on the Indian Ocean Ridges**, not currently described as EBSAs, were considered both individually and collectively. Recent study of biogeographic patterns of vent fauna on the Carlsberg Ridge would likely support a new EBSA description[9]. On the SW Indian Ridge, Longqi – a black smoker located on an ultraslow spreading centre – is a site of intensive scientific study. Together with Duanqiao it is faunistically distinct from sites on the Central Indian Ridge and biogeographically distinct from Scotia Arc and southern Mid-Atlantic Ridge vent faunas[10,11]. Key species include the scaly-foot and peltospirid gastropods with endosymbionts as well as a yeti crab species and mussels. On the Central Indian Ridge, Kairei is the first hydrothermal vent site discovered in this part of the Indian Ocean, revealing potentially a new biogeographic province. The site is dominated by shrimp[12], hairy gastropods and it is the discovery locale of the scaly-foot gastropod[13].

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[9] Zhou et al. (2022) Delineating biogeographic regions in Indian Ocean deep-sea vents and implications for conservation. *Diversity and Distributions*. DOI: 10.1111/ddi.13535.

[10] Zhou et al. (2018) Characterisation of vent fauna at three hydrothermal vent fields on the Southwest Indian Ridge: implications for biogeography and interannual dynamics on ultraslow-spreading ridges. *Deep Sea Research Part I*. DOI: 10.1016/j.dsr.2018.05.001

[11] Copley et al. (2016) Ecology and biogeography of megafauna and macrofauna at the first known deep-sea hydrothermal vents on the ultraslow-spreading Southwest Indian Ridge. *Scientific Reports*. DOI: 10.1038/srep39158

[12] Watabe & Hashimoto (2002) A new species of the genus Rimicaris (Alvinocarididae; Caridea; Decapoda) from the active hydrothermal vent field "Kairei Field" on the Central Indian Ridge, the Indian Ocean. *Zoological Science*. DOI: 10.2108/zsj.19.1167

[13] Van Dover et al. (2001) Biogeography and ecological setting of Indian Ocean hydrothermal vents. *Science*. DOI: 10.1126/science.1064574

Further work is needed to determine whether three EBSA descriptions (based on genetic differentiation) or one all-encompassing EBSA description would be most appropriate.

11. Finally, the workshop considered opportunities to describe EBSAs in two regions not yet included as part of the CBD Regional Workshop coverage, namely the SW Atlantic and the Southern Ocean. Littoral States to the SW Atlantic prefer to await the outcome of the BBNJ negotiations to inform area-based management tools. In the Southern Ocean, the Antarctic Treaty System is a separate process. However, given the role of EBSAs is to inform competent international organisations, whoever they may be, and that ABNJ is by definition outside of the direct mandate of littoral governments, the workshop decided it made no sense for this scientific and technical exercise to ignore any critically important and information-rich region. Hence the ecological and biological significance of three case study areas in ABNJ were discussed as follows:

a. **The SW Atlantic Sub-tropical Convergence Zone** was suggested as a western continuation of a similar feature described as an EBSA by the CBD SE Atlantic Regional EBSA Workshop in 2013. This dynamic, high productivity feature is driven by the confluence of the warm southward-flowing Brazilian current and the cold northward-flowing Malvinas current that then generates eastward-flowing productivity, supporting high productivity of fish and squid and associated marine mammal populations.

b. **The Ross Sea including the Scott Islands and Iselin Bank** was selected as one of the most productive areas of the Southern Ocean and identified as an IMMA during a dedicated regional workshop for the Extended Southern Ocean (Brest, 2018)[14]. These sizeable IMMAs could inform an EBSA, scoring high in every EBSA criterion and coincident with the Ross Sea Region Marine Protected Area (except for the Iselin Bank due to high fishing pressure) designated by the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) in October 2016. The Workshop also noted other factors contributing to ecological or biological significance including the presence of unique fish and invertebrate species, seabirds and a deep-sea hydrothermal vent in this area.

c. **The Antarctic Peninsula**: an exemplar of a network of 18 Important Bird and Biodiversity Areas identified as foraging areas for three species of penguin (some 3 million birds), and supporting three of the most threatened groups of seabirds (albatross, petrels and penguins) informed by recently published papers presenting analysis of tracking data using a modified foraging radius approach. Analysis suggested high scores for special importance for life-history stages of species and biological productivity EBSA criteria (tightly coupled to seasonal phytoplankton blooms). Consideration was also given to the human threats to these birds from overfishing and climate change.

[14] https://www.marinemammalhabitat.org/download/final-report-of-the-regional-workshop-for-the-extended-southern-ocean-important.marine-mammal-areas/

Challenges

12. The exercise to review existing EBSAs in ABNJ and scope new possibilities also highlighted several key challenges (in no particular order) as follows:

Scientific challenges

a. **Scale**: EBSAs are described at a very wide range of spatial scales, which is linked to variable definitions of the scale of scientific objectives above. EBSAs are not always described at the level of detail relevant for some potential end uses/users. EBSAs can serve as a spatial index and geographic focus into deeper levels of information. EBSAs in ABNJ generally describe extensive features. Ultimately EBSA information should be used wherever possible to raise awareness and frame conservation and sustainable use actions in ABNJ.

b. **Data deficits and expressing uncertainty (evidence vs assumptions)**: In ABNJ there are grave data deficits that will need to be filled for a systematic assessment of potential new EBSAs. For example, better understanding why megafauna aggregate in some areas rather than others to provide an insight into what features are actually important for those species, and what role low-level trophic species and oceanographic variables have in distribution patterns of other larger animals. Acknowledgement and quantification of uncertainty in some data products is a longstanding need and gap in marine spatial data. New technologies will allow us to be smarter with our sampling strategies, but alternative data streams are also likely important. For example, more accessible fisheries data are needed for the High Seas – can we make better use of fleets or Regional Fisheries Management Organisations? Proprietary data could be important but it is often hard to discover and access. Despite this, workshops where participants have overcome challenges of data accessibility and availability have confirmed information gathering/sharing as a strength of the EBSA process, promoting the use of appropriate analogues and proxies for certain ecological characteristics, and developing predictive habitat modelling.

c. **Are some features not as significant as initially thought?** The slow pace of deep-sea discovery and/or incomplete information may result in some features being described as significant, which later proves to not be the case. A continuous process should evaluate whether features are over-valued or not, recognising that information may be incomplete at the time of description.

d. **Under-represented features or species groups**: Charismatic species may be too dominant in EBSA descriptions, perhaps reflecting the expertise present at the workshop. However, the possible umbrella and/or flagship value of these should not be forgotten. Ultimately detailed information in the EBSA descriptions is key to identifying confidence in how complete or broad the underlying data and information are. Accounting for functional groups and ecosystem services may be helpful in developing broader EBSA portfolios.

e. **Linking with other knowledge systems**: Greater effort is needed to ensure all knowledge systems are identified and included in the process. This needs to include Indigenous knowledge systems as well as Western science. Industry engagement opportunities should be also be maximised.

f. **Criterion Definition:** A technical challenge discussed at the workshop was whether the productivity criterion is appropriate for the deep sea. Productivity as a general term can relate also to concepts of abundance and biomass. High standing stock with very slow recovery times should score highly for biomass rather than productivity, and perhaps for EBSAs in ABNJ there should be an option to use either.

g. **Missing expertise**: The nomination of experts by Parties to Regional Workshops has limited the number of deep-sea scientists engaged with the EBSA process to date. This may need to be re-thought, potentially incorporating a virtual or hybrid workshop format, to achieve more comprehensive coverage of ABNJ. More interaction between the EBSA process and GOOS/DOOS could help balance expertise. Taxonomists could be more involved in some situations. For example, in the CCZ 70-90% of species collected are new to science and a further 25-75% of species remain to be collected at any sampled site. Appropriate expertise to understand ecological or biological significance at different depths is also important in ABNJ. Thus far, involvement of pelagic expertise in the EBSA process has been particularly limited. Expertise in traditional knowledge could also be strengthened at future workshops. Furthermore, the concentration of scientific talent in more economically developed countries to the detriment of less economically developed countries needs to be addressed (e.g. by creating a global fund).

Governance challenges

h. **Political and jurisdictional concerns**: These have frustrated the uptake (and perhaps scientific credibility) of the EBSA process. Discussions within CBD about how to keep EBSA descriptions up to date and incorporate work under other processes remain unresolved. Ratification of the BBNJ Treaty should bring more certainty for ABNJ, but some issues are complex - such as extended continental shelf submissions or tensions between regional and global mandates.

i. **Governance gaps:** Some parts of ABNJ have no regional organisations with management competence (e.g. incomplete Regional Sea Organisation or Regional Fisheries Management Organisation coverage), therefore there is no management body to take note of EBSAs in these regions.

Procedural challenges

j. **Lack of clarity about what an EBSA is, what it is for and relevant scientific objectives**: The emphasis to date has been on compiling and evaluating scientific knowledge rather than addressing management implications. Whilst we shouldn't allow the process to handicap the science it is important to appreciate that process can provide context for science (i.e. explain what we are doing the science for). Does it matter who is going to use EBSA descriptions in ABNJ? Should that influence how they are identified? Clarity is needed to achieve the increased ambition of the Kunming-Montreal Global Biodiversity Framework and to recognise other intergovernmental processes that are conducting complementary exercises to identify important areas (VMEs, PSSAs).

k. **Funding challenges:** Future workshops and updating exercises (whatever form they may take) will need new funding. This links to an associated resource challenge, namely inequity in ability (capacity) to move forward, with a trend for more economically developed countries to attract scientific talent that does not return to less developed countries (i.e. 'science colonialism'). Many have expertise to contribute but do not have the possibility to study locations in ABNJ because of lack of infrastructure (research vessels, ship time allocation, equipment for mesopelagic and deep sea observing).

Improving the utility of EBSAs (with particular reference to ABNJ)

13. The workshop discussed how EBSAs in ABNJ (but also more generally) can be made more user friendly. These included:

a. **Opportunities to change/update information:** Lessons can be learned from how EBSA information has been used (or not used) in national processes. Gaps have also arisen as unintended consequences of how boundaries were described and delineated by the CBD Regional EBSA Workshops.

b. **Naturalness as a relevant criterion in ABNJ:** It is relevant to underline that a spectrum of high seas sites need protection including those that are currently exposed to limited impacts.

c. **Better engagement with/from competent international bodies**: To date, FAO have engaged strongly (participating and sharing data) but individual RFMOs less so (with the exception of NAFO) and limited engagement from ISA and IMO;

d. **Different visualisation products:** Opportunities to innovate such as producing maps relevant to specific criteria or overlaying EBSA descriptions with other taxa-based area descriptions (e.g. IBAs, IMMAs, ISRAs) and KBAs.

e. **Using EBSA information gaps to inform best places for future surveys**: In planning research (e.g. as part of Challenger 150) and taking advantage of other ways to strengthen the information base, such as fostering application of new technologies (e.g. satellite technology, eDNA) and making use of platforms of opportunity.

f. **Identifying appropriate management measures**: Work with relevant States to identify and propose relevant measures within EBSAs in ABNJ as well as reaching out to other relevant stakeholders.

g. **Factor in climate change**: Views were expressed on whether this should be a new criterion[15] or part of network criteria. On balance, the majority view was that sites cannot be considered in isolation (and we need to consider impacts across depths). There is value in undertaking a projection of climate impacts on existing EBSAs using different scenarios, recognising tropicalisation, expansion of deoxygenation and the effects of acidification, noting that climate change can be positive for some EBSAs and that climate refugia can represent a flip side of vulnerability (i.e. an indication of stability under climate change).

h. **An informed discussion on expert-driven vs systematic conservation approaches**: The use of EBSAs was originally linked to the development of a representative network of MPAs (CBD, 2008). How this can develop warrants further discussion. Could this inform global-scale marine spatial planning? What provinces do existing areas cover? Are descriptions inadequate to do this? Can we merge expert vs systematic processes?

i. **Better access to EBSA information and transparency:** To be useful the CBD Repository and Information Sharing Mechanism need to contain actionable and open data (with filters for species/features and overlapping relevant bodies) that can be easily downloaded. Thus, for example, metadata of shape files could be improved to allow download of a 'package'. A data portal allowing easier consultation and extraction of data would also help as would incorporation of EBSAs in other relevant portals such as NaturalEarth. The information

[15] Johnson & Kenchington (2019) Should potential for climate change refugia be mainstreamed into the criteria for describing EBSAs? *Conservation Letters*. DOI: 10.1111/conl.12634

gathering process could also be more open including, for example, automated notifications to relevant Parties and competent international organisations with a timeframe to comment.

j. **Raising awareness**: The value of EBSAs has not generally been realised in raising public awareness. The workshop discussed ways to increase NGO involvement – recognition that EBSAs can be incorporated into conservation actions. How can we involve more NGO groups in the process and facilitate their use of EBSA information? This links to ocean literacy and creating public awareness of the marine environment and finding a way to entice today's youth into the study of ocean science.

Threats to EBSAs in ABNJ

14. To date, the CBD EBSA process has not considered threats. However, the workshop felt it important in terms of advancing actionable science to reflect on threats to EBSAs in ABNJ as a way of identifying those EBSAs most at risk (i.e. for which management measures should be considered urgently). These included fisheries, climate change, deep-sea mining, maritime traffic, pollution, governance/legislative inertia and mesopelagic fishing.

15. Piers Dunstan (CSIRO, Australia) presented a qualitative ecosystem model approach as a useful start to risk assessment. The model describes key ecosystem components, the pressures on the system and likely impacts if they occur. This was illustrated with examples for the Southwest Indian Ocean Ridge and Northwest Pacific Seamounts. Response predictions of these benthic ecosystems to cumulative impacts illustrated that different hazards will impact different EBSAs in different ways, hence a case-by-case assessment is likely appropriate.

16. As an exploratory exercise, a subjective ranking – considering both current and future threats – was undertaken for the examples of potential new EBSAs in ABNJ that provided the focus for this workshop. This approach has been formalised in a recently published global horizon scan of issues impacting marine and coastal biodiversity conservation[16]. It could be the subject of a future workshop. Consideration was given to the evidence needed to support such an assessment such as bycatch reports and vulnerability assessments.

17. Potential future threats discussed included governance issues (such as the Ross Sea sunset clause or failure to ratify BBNJ), changing distributions of commercial fish species (moving activity into areas that currently have a limited fishing footprint), and mesopelagic fishing prospects.

Options for taking this work forward

18. Acknowledging that the workshop never intended to make a comprehensive assessment of EBSAs in ABNJ, a number of suggestions emerged for further work to inform scientific understanding and help strengthen the EBSA portfolio:

- Systematic analyses, which may be more objective and transparent (e.g. quantitative numerical evaluation of criteria for a region on 1-degree grids as undertaken for E-SE Asia[17]

[16] Herbert-Read et al. (2022) A global horizon scan of issues impacting marine and coastal biodiversity conservation. *Nature Ecology & Evolution*. DOI: 10.1038/s41559-022-01812-0

[17] Yamakita et al. (2017) Identification of important marine areas using ecologically or biologically significant marine area (EBSA) criteria in the East to Southeast Asia region and comparison with existing registered areas for the purpose of conservation. *Marine Policy*. DOI: 10.1016/j.marpol.2017.03.040

and further interrogation of BirdLife tracking data to show 'heat map' density of track locations outside existing EBSAs for selected species).

- Thematic reviews for selected features or species groups that could be both systematic[18] and expert-driven (e.g. GOBI presentation to CBD SBSTTA 24 by Cindy van Dover and Elisabetta Menini suggesting that, on the basis of new science, all active deep-sea hydrothermal vent ecosystems qualify as special places against the EBSA criteria).

- Analysis of World Seafloor Geomorphology (GRID-Arendal) to scope features that could support EBSAs such as canyons, fracture zones, trenches etc.

- Follow-up of recent scientific surveys (e.g. EAF Nansen research cruises in 2022 to the Guinea Seamount Chain and Sierra Leone Rise in the Atlantic).

19. On the basis of these deliberations, recognising that the EBSA process in ABNJ is currently not in tune with the speed/rate of environmental change and biodiversity loss, the workshop concluded that, subject to a Decision by CBD Conference of the Parties and available funding, and in the context of implementing the BBNJ Treaty, CBD could consider one or more of the following options:

a. Substantially improve access to EBSA information to enable it to be used more widely. The information gathering process could also be more open, including automated notification to relevant authorities/parties providing a limited time period for comment.

b. Commission an independent scientific review of EBSAs in ABNJ to evaluate consistency and address some of the challenges identified by this workshop. This could take into account any voluntary guidelines on peer-review process for the identification of areas meeting EBSA criteria and other relevant compatible / complementary scientific criteria, and include a threats/risk assessment exercise on the EBSA portfolio.

c. Encourage submission of templates of candidate EBSAs in ABNJ (such as those considered as working documents for this workshop) to the Information Sharing Mechanism, thus providing a further resource for States and competent international organisations. This would be compatible with the Information Sharing Mechanism containing 'other relevant scientific and technical information and other forms of knowledge related to areas described as meeting the EBSA criteria' (as currently drafted in SBSTTA 24 crp 4 Annex II, 2d).

d. Consider a second round of regional workshops, perhaps with consolidated regions and a brief to give particular thought to ABNJ, within an expedited timeframe.

e. Explore the merits of thematic global review workshops (perhaps in collaboration with the Convention on the Conservation of Migratory Species of Wild Animals), giving an opportunity for greater transparency and opportunities to address issues of scale, strength of evidence and consistency between regions.

f. Task the EBSA Informal Advisory Group to champion EBSAs in ABNJ and raise awareness, including facilitating engagement with other UN Agencies.

[18] Clark et al. (2014) Identifying Ecologically or Biologically Significant Areas (EBSA): A systematic method and its application to seamounts in the South Pacific Ocean. *Ocean & Coastal Management*. DOI: 10.1016/j.ocecoaman.2014.01.016

Postscript note

20. The (second official part of the) 15th Conference of the Parties to the CBD took place from 7-19 December 2022 (shortly after the EBSAs in ABNJ Workshop). Three Decisions specific to EBSAs and the CBD's marine and coastal biodiversity portfolio were adopted as follows:

i. CBD/COP/15/L.13: finalised the North-East Atlantic Ocean and adjacent areas EBSA Workshop results, adding a further 17 EBSAs to the CBD Repository (now 338 EBSAs);

ii. CBD/COP/15/L.14: reflects that the COP failed to resolve the issue on modalities to amend and/or describe new EBSAs in different jurisdictions. The Decision requests the Secretariat to convene expert workshops; develop draft ToR for a 'relevant expert advisory body'; and develop voluntary guidelines on peer review processes for the description of areas meeting the criteria for EBSAs for consideration by SBSTTA prior to COP16; and

iii. CBD/COP/15/L.15: provides an explicit link to relevant assessments and highlights the critical importance of the marine environment to the Kunming-Montreal Global Biodiversity Framework, making specific reference to marine spatial planning, other effective conservation measures and the BBNJ Implementing Agreement upon its adoption.

21. The EBSAs in ABNJ Workshop, the subject of this report, is also relevant to the central outcome of COP15, namely the Kunming-Montreal Global Biodiversity Framework (GBF) (Decision CBD/COP/15/L.25 and associated supporting Decisions). In addition to relevant Goals and Targets of the GBF and its Monitoring Framework, of particular relevance are Decision CBD/COP/15/L.28 on capacity-building and technical and scientific cooperation in implementing the GBF and Decision CBD/COP/15/L.32 on knowledge management inviting *"biodiversity-related conventions organizations, and others supporting the generation, discovery, capture, management and use of biodiversity-related data, information and knowledge to contribute to the CBD Clearing-House Mechanism (CHM), to promote and facilitate collaboration among them with a view to making biodiversity-related data, information and knowledge more readily available and accessible for biodiversity planning, policy and decision-making, implementation, monitoring, reporting and review."*

Annex 1: Workshop programme

Sunday 6 November 2022	
13:00	Participants arrive, light lunch
14:00 - 14:30	Welcome, introductions *David Johnson, GOBI Coordinator*
14:30 - 14:45	Introduction to scope and objectives of the workshop; links to other processes (post-2020 GBF, BBNJ, ISA REMPs) and potential to feed into CBD COP15 *David Johnson, GOBI Coordinator*
14:45 - 15:15	The EBSA process and ABNJ *Daniel Dunn, University of Queensland*
15:15 - 15:35	Applying the EBSA criteria *Pat Halpin/Jesse Cleary, Marine Geospatial Ecology Lab, Duke University*
15:35 - 16:05	Coffee break
16:05 - 16:30	Review and critique of existing EBSAs in ABNJ *Daniel Dunn, University of Queensland*
16:30 - 16:55	Overview of data available to support the EBSA process, data gaps, proxies and analogues *Jesse Cleary, Marine Geospatial Ecology Lab, Duke University*
16:55 - 17:30	Discussion / Q&A
18:30	Informal evening discussion session (in person only; venue TBC)

Monday 7 November 2022	
08:45	Participants arrive, coffee
09:00 - 10:30	Presentation and discussion of draft EBSA templates (to highlight what each proposal is exemplifying as well as making a sound scientific case against the EBSA criteria) *Presenters: lead authors of EBSA templates. Order TBC*
10:30 - 11:00	Coffee break
11:00 - 12:45	Presentation and discussion of draft EBSA templates - continued *Presenters: lead authors of EBSA templates. Order TBC*
12:45 - 14:00	Lunch break
14:00 - 15:30	Presentation and discussion of draft EBSA templates - continued *Presenters: lead authors of EBSA templates. Order TBC*
15:30 - 16:00	Coffee break
16:00 - 17:30	Reflection on features/habitats of significance and deep-sea challenges (*facilitated by David Johnson*):

Tuesday 8 November 2022	
08:45	Participants arrive, coffee
09:00 - 10:30	Consolidation and refining of EBSA templates - working in groups as appropriate

10:30 - 11:00	Coffee break
11:00 - 12:45	Consolidation and refining of EBSA templates - working in groups as appropriate (continued)
12:45 - 14:00	Lunch
14:00 - 15:30	Stock take, reflection and discussion
15:30 - 16:00	Coffee break
16:00 - 17:00	Discussion (continued)
19:00	Workshop dinner (venue TBC)

Wednesday 9 November 2022	
08:45	Participants arrive, coffee
09:00 - 10:30	Summary presentation of results and discussion of scientific and governance limitations *Presenters TBD*
10:30 - 11:00	Coffee break
11:00 - 12:45	Threats to biodiversity in ABNJ: consideration for EBSA descriptions *Piers Dunstan, CSIRO* Discussion
12:45 - 14:00	Lunch
14:00 - 15:00	Options for CBD (e.g. full ABNJ workshop; species specific thematic workshops for data-rich taxa; a technical report to BBNJ highlighting candidate ABMTs; etc.) *David Johnson, GOBI Coordinator*
15:00 - 15:30	Future steps; wrap-up *David Johnson, GOBI Coordinator*

Annex 2: List of workshop participants

Name	Affiliation	Participation
David Johnson (Chair)	Seascape / GOBI Secretariat	In person
Vikki Gunn (organiser)	Seascape / GOBI Secretariat	In person
Chris Barrio	Seascape / GOBI Secretariat	Online
Diva Amon	Univ. California Santa Barbara	In person
Jeff Ardron	PACMARA	Online
Sarah Becker	University of Colorado Boulder	In person
Cassandra Brooks	University of Colorado Boulder	Online
Bob Brownell	IMMA review committee	In person
Malcolm Clark	NIWA	In person
Jesse Cleary	MGEL Duke University	In person
Dan Costa	Univ. California Santa Cruz	In person
Tammy Davies	BirdLife International	In person
Sarah Deland	MGEL Duke University	In person
Daniel Dunn	University of Queensland	In person
Piers Dunstan	CSIRO	Online
Elva Escobar	Univ. Nacional Autonoma de Mexico	Online
Brit Finucci	IUCN SSC Shark Specialist Group	Online
David Freestone	Sargasso Sea Commission	Online (TBC)
Kristina Gjerde	IUCN	In person
Pat Halpin	MGEL Duke University	Online
Jean Harris	Wild Oceans	Online
Autumn-Lynn Harrison	Smithsonian Institute	In person
Donna Hayes	CSIRO	Online
Kerry Howell	Plymouth Marine Laboratory	Online
Jorge Jimenez	MarViva Foundation	In person
Anna Metaxas	University of Dalhousie	In person
Lance Morgan	Marine Conservation Institute	In person
Giuseppe Notarbartolo	Tethys Research Institute	In person
Guillermo Ortuno Crespo	Independent	In person
Juliano Palacios	University of British Columbia	In person
Simone Panigada	Tethys Research Institute	In person
Beth Pike	Marine Conservation Institute	In person
Erick Ross	Migramar	In person
Ana Sequeira	Australian National University	In person
George Shillinger	Upwell	Online
Yoshihisa Shirayama	JAMSTEC	Online
Bryan Wallace	Ecolibrium/Univ. Colorado Boulder	Online
Les Watling	University of Hawaii at Manoa	In person
Joana Xavier	CIIMAR, University of Porto	Online
Take Yamakita	JAMSTEC	In person