

A New Impetus for Particularly Sensitive Sea Area Designation

David E. Johnson* and Christopher Barrio Froján

Seascope Consultants Ltd
Romsey, Hampshire
United Kingdom



www.cerf-jcr.org



www.JCRonline.org

ABSTRACT

Johnson, D.E. and Barrio Froján, C., 2020. A new impetus for Particularly Sensitive Sea Area designation. *In: Malvárez, G. and Navas, F. (eds.), Global Coastal Issues of 2020. Journal of Coastal Research, Special Issue No. 95, pp. 829–834. Coconut Creek (Florida), ISSN 0749-0208.*

Designation of 15 Particularly Sensitive Sea Areas (PSSAs) by the United Nations International Maritime Organization (IMO) has taken place over a period of 30 years (1990-2020). Each of these areas must qualify on its own merits, and is subject to collective scrutiny by the IMO Marine Environmental Protection Committee and other relevant IMO technical committees. In principle, evidence must be presented to demonstrate that a sensitive and valuable site is vulnerable to adverse impacts from activities associated with international shipping, activities which can be addressed by an Associated Protective Measure within the purview of IMO. In practice, designation of PSSAs has taken place in a series of pulses stimulated by marine accidents, changes in legislation, and through revision of the IMO Guidelines. This article examines two case studies: the Tubbataha Reefs Natural Park in the Philippines and the Banc d'Arguin in Mauritania. The impetus for both has been a desire by the Intergovernmental Oceanographic Commission of UNESCO to reduce the vulnerability of marine World Heritage Sites and their recognised 'outstanding universal value' to the adverse impacts of international shipping activities. For Tubbataha Reefs Natural Park, the catalyst was high profile groundings of two vessels in the Spring of 2013. For Banc d'Arguin, it was a recognition of the migratory avifaunal links to Europe and a unique oceanic upwelling system. A wider study to make best use of data gathered by the Convention on Biological Diversity's process to describe Ecologically or Biologically Significant Areas is also reviewed. The article concludes that this is a best practice example of marine governance, where the remits of UN agencies coincide and complement each other. Cooperation amongst agencies can provide for better protection and awareness-raising of the value of unique marine ecosystems. Recommendations are made to explore other opportunities for synergies.

ADDITIONAL INDEX WORDS: *International shipping, area-based marine management, conservation, World Heritage.*

INTRODUCTION

Covering over 70% of Earth's surface and representing 90% of its habitable volume, the ocean is integral to planetary processes such as the cycling of water, nitrogen, carbon, heat and life. Humankind benefits from the ocean directly through its provision of resources including food, habitat, energy, biodiversity and transportation, as well as through derived cultural qualities and economic opportunities such as resource exploitation and trade.

The regulation or management of human activities in the ocean is entrusted to sovereign states within their jurisdictional waters, or to activity-specific regulators in oceanic areas beyond national jurisdictions (ABNJ). Several pertinent international global and regional governing bodies are also involved. Whether activities exploit – alone or in combination – the sea surface, the seafloor, or the water column in between, is also a consideration. Many regulatory bodies employ area-based management tools to

segregate spatially or temporally overlapping activities that may conflict with one another.

International shipping is one of the most ancient, significant, lucrative and critical activities in the ocean. It transports more than 80% of global trade to peoples and communities all over the world; it provides a dependable, low-cost means of transporting goods globally, facilitating commerce and helping to create prosperity among nations and peoples. Being such a widespread and assiduous activity, shipping is embedded in, and overlaps with almost all other human activities in the ocean, be they close or far from shore, sporadic or ongoing. Regulation of maritime safety and navigation, the prevention and control of marine pollution from ships, and other matters concerning the effect of shipping on the marine environment are all entrusted to the International Maritime Organization (IMO), a United Nations specialised agency. The regulatory framework for the shipping industry developed and maintained by the IMO is intended to be fair and effective, universally adopted and universally implemented.

Part of the IMO's regulatory framework includes measures to prevent and control pollution caused by ships, and to mitigate the effects of any damage that may occur as a result of maritime operations and accidents. These measures are overseen by the

DOI: 10.2112/SI95-161.1 received 31 March 2019; accepted in revision 13 February 2020.

*Corresponding author: david.johnson@seascopeconsultants.co.uk

©Coastal Education and Research Foundation, Inc. 2020

IMO's Marine Environment Division, directed by the Marine Environment Protection Committee (MEPC) and aided by a number of sub-committees. One available measure – the designation of a Particularly Sensitive Sea Area (PSSA) – can be conferred by the IMO's MEPC to an area that requires special protection because of its significance for recognised ecological, socio-economic or scientific reasons, and which may be vulnerable to damage by international maritime activities. Updated guidelines on designating PSSAs were adopted by the IMO Assembly in Resolution A.982(24) (IMO, 2006).

Many other international and regional instruments recognise and/or encourage the protection of areas important for the conservation of biological diversity, as well as areas with high ecological, cultural, historical, archaeological, socio-economic or scientific significance. Some such instruments include the United Nations (UN) Convention on Biological Diversity's Ecologically or Biologically Significant Areas (CBD EBSAs), the UN Educational, Scientific and Cultural Organization's (UNESCO) World Heritage List, the International Seabed Authority's Areas of Particular Environmental Interest (ISA APEIs), The UN Food and Agriculture Organization's Vulnerable Marine Ecosystems (FAO VMEs), the Regional Seas Conventions' Marine Protected Areas, Specially Protected Areas and Priority Conservation Areas, BirdLife International's Important Bird and Biodiversity Areas (IBAs), and the Marine Mammal Protected Areas Task Force's Important Marine Mammal Areas (IMMAs), amongst others. Several of these designations meet the definition of other effective area-based conservation measures (OECMs) as referenced in Aichi Biodiversity Target 11 and adopted by the CBD as part of the Strategic Plan for Biodiversity 2011-2020 (CBD, 2018; Diz *et al.*, 2018).

As part of the UN 2030 Agenda for Sustainable Development adopted in 2015 (UN, 2015), States and Governments adopted a set of 17 sustainable Development Goals (SDGs) that integrate economic, social and environmental dimensions of sustainable development. All countries have a shared responsibility to achieve the SDGs in an integrated manner, and all have a meaningful role to play locally, nationally and globally. To this end, the purpose of the present investigation is to describe the workings of an existing mechanism that promotes sustainable resource use through the safeguarding of vulnerable aspects of the marine environment (*i.e.*, the IMO's PSSA designation process), and to demonstrate its compatibility with other mechanisms with a similar remit around other activities in the ocean (*e.g.*, UNESCO's World Heritage listings or the CBD's EBSA process). By comparing and contrasting such mechanisms, commonalities may be revealed that could promote a better integration of approaches to marine spatial management, including nature conservation, and ultimately could facilitate the streamlining of efforts by international regulatory bodies towards the achievement of the interdependent SDGs.

METHODS

The stepwise process that can culminate in the approval and designation of PSSAs is set out in the guidelines adopted by the IMO Assembly in Resolution A.982(24) (IMO, 2006; Figure 1). Essentially, for an area to be considered, it must not only satisfy at least one of the ecological, socio-economic, cultural or scientific criteria, it must also be at risk or vulnerable to damage from international shipping activities. The threat from international shipping activities to the recognised attributes must be described

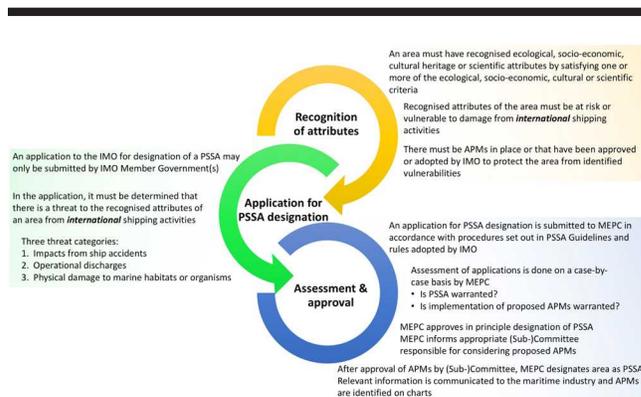


Figure 1. The PSSA application and designation process.

in the application. Appropriate associated protective measures (APM) to mitigate against the described threat must also be prepared and included in the application for consideration. An application for PSSA status may only be submitted to the IMO's MEPC by one or several interested IMO Member Governments. Assessment of each application is conducted by the MEPC during its periodic meetings (approximately every 9 months). Once a PSSA is approved in principle, APMs are sent for approval by an appropriate IMO Sub-Committee. Typically, APMs approved or adopted by the IMO entail one or more of the following actions: a recommended or compulsory pilotage, the mandatory reporting of passage by high-risk vessels or cargo, traffic separation schemes, areas to be avoided, no anchorage areas, or the prohibition of certain discharges in declared Special Areas.

The PSSA designation itself has no legal basis as it is derived from a non-binding IMO Assembly resolution. However, protection through the use of APMs provides the legal basis for regulatory control of shipping. On designation, PSSAs and APMs are published in notices to mariners and as certified updates to nautical charts.

To showcase the workings of the PSSA designation process, two case studies are described, each at a different stage along the process: the Tubbataha Reefs Natural Park in the Philippines and the Banc d'Arguin National Park and adjacent sea in Mauritania. A selection of other discrete areas of the ocean that have undergone an assessment by the CBD's EBSA process (Johnson *et al.*, 2018) and which may have the potential to inform the IMO's PSSA process have been identified and assessed against PSSA criteria. The legal, technical, scientific and practical considerations of similar processes informing one another are explored.

RESULTS

Brief descriptions of the PSSA application process for each of the two case study areas are presented in turn. A summary of the findings from a review of selected EBSAs with the potential to inform the PSSA process is also presented.

Tubbataha Reefs Natural Park

The Tubbataha Reefs Natural Park (TRNP) encompasses an area of 970.3 km² located in the Sulu Sea, in the Philippine province of Palawan, at the heart of the Coral Triangle. The Coral Triangle is regarded as the richest marine biodiversity hot-spot in the world (Hoeksema 2007; Miller *et al.*, 2018). The park was established

as a national marine protected area by the Philippines in 2010. Within it lie the Tubbataha Reefs, a coral reef complex with two large atolls and the Jessie Beazley Reef. It was inscribed as a World Heritage Site in 1993, and on the Ramsar List of Wetlands of International Importance in 1999. It lies inside the boundaries of the Sulu-Sulawesi Marine Ecoregion multi-site EBSA, adopted by the CBD in 2016 (CBD, 2016). The TRNP was designated as a PSSA in 2017 (IMO-MEPC, 2017), with the establishment of an area to be avoided as an APM (IMO, 2017; implemented in 2018), aimed at improving the safety of navigation and the protection of the marine environment.

As one of the last few remaining examples in the world of a highly diverse, near-pristine coral reef complex in an offshore area located far from human settlements, the TRNP scores highly against all of the ecological, socio-economic, cultural and scientific criteria for PSSA designation (IMO-MEPC, 2017).

The TRNP lies at the intersection of north-south and east-west shipping routes that traverse the Sulu Sea, connecting the South China Sea to the Celebes Sea and to the Pacific Ocean. Consequently, there is a significant and growing risk of accidental spills and even grounding on the reefs, increasing the vulnerability of all the recognised attributes of the TRNP. Notably, two successive ship-grounding incidents that took place in 2013 (the *USS Guardian* in January and the *Min Ying Pu* in March), which prompted the submission by the Philippines and UNESCO of the application for the TRNP to be considered as a PSSA (IMO-MEPC, 2014). The threat of oil and chemical pollution and potential catastrophic impact on coral reefs is well known (Jernelöv, 2010). Moving the concentration of shipping away from the Park significantly reduces the risks of incidents.

Banc d'Arguin National Park and Adjacent Sea

The Banc d'Arguin National Park (BANP) and adjacent sea (Gulf d'Arguin) are on the Atlantic coast of Mauritania. The BANP itself extends from Cap Timiris in the south to Pointe Minou in the north. Seaward, the park boundary extends 60 km offshore, covering an area of sea and coastal wetlands of 12,075.0 km². The ecological connections of BANP extend far offshore, encompassing the Cap Blanc upwelling system, an oceanic feature that sustains elevated biological productivity far beyond Mauritania's Exclusive Economic Zone (EEZ). The park was established in 1976 to protect both its significant natural resources and valuable local fisheries. It was designated as a Ramsar Site in 1982 and inscribed on the World Heritage List in 1989. In 2014, two EBSAs were identified by the CBD that cover the upwelling zone and the interdependent coastal habitats of Mauritania and north of Senegal (CBD, 2014).

According to a feasibility study, the BANP and adjacent sea comprehensively meet the ecological criteria and many aspects of the socio-economic, cultural heritage and scientific criteria for PSSA designation (IMO, 2006). The area is part of the East Atlantic flyway (BirdLife Factsheet, 2019) and hosts the largest concentration of wintering wading birds (from Europe) in the world. Its extraordinary productivity also supports one of the most diversified communities of nesting piscivorous birds in the world.

Different types of international vessels pass through the Mauritanian EEZ within close proximity to the BANP; the route is one of the most heavily trafficked in the North Atlantic. Between 400 and 500 million tonnes of hydrocarbons are shipped through Mauritanian waters each year. Some 40-100 large demersal

trawlers also frequent the area. Ship-specific risks, increasing vessel traffic, interaction between international shipping and other activities (e.g., oil and gas extraction), and chronic poor offshore visibility (caused by airborne Saharan dust; Dunion and Velden, 2004) all pose a real threat to the natural integrity of the region. The region is ill equipped for a major counter-pollution effort.

Mauritania's intention to apply for PSSA designation within its EEZ was communicated to MEPC in 2015, followed in 2016 by submission of background information on the criteria satisfied (IMO-MEPC, 2016). Formal application for PSSA status awaits the provision by national stakeholders of quantitative data to support the risk assessment and development of potential APMs. Potential APMs under discussion include a deep-water traffic separation scheme over the upwelling zone to reduce the risk of collision between ships in transit offshore, and a discrete precautionary area encompassing the Chinguetti oil field in the Gulf d'Arguin to minimise the risk of collision between international shipping and oil exploitation activities (IMO-MEPC, 2016).

Summary of Review of Selected EBSAs

Nine EBSAs selected to represent a variety of navigational circumstances (e.g., within national waters, in ABNJ, straddling national and international jurisdictions, primarily benefiting seabirds or marine mammals) were assessed (Lyons, 2019) to ascertain whether the information gathered by the EBSA process could in turn be useful for the PSSA designation process, or whether any attribute identified by the EBSA process may be vulnerable in principle to impacts from international shipping.

The results of the assessment were interesting and useful, but inconclusive. A key finding and recurring issue of the assessment was the incompatibility between scales at which each process can operate. Scientific evidence in support of EBSA criteria can often be available and be sufficient at relatively low resolution over a large spatial scale, enabling the description of EBSAs over large expanses of ocean where the impact of any human activity in isolation would be difficult to discern, let alone monitor or mitigate. By contrast, IMO measures, such as APMs, may only be applied to more discrete areas where there is direct evidence of the potential for international shipping to harm or impact the recognised attributes. In addition, where specific and adequate information might be easily generated in principle, such as in nearshore waters close to ports, this information doesn't always exist or is not readily available, particularly around least developed or developing States, thus preventing the assessment of vulnerability of recognised attributes to apparent risks and threats (e.g., the Churna-Kaio Island Complex EBSA in the eastern Arabian Sea, in which the highly polluting Gadani international ship-breaking site is located; Lyons, 2019).

Specific examples of where EBSA-derived information could more easily complement the PSSA process are the Oman Arabian Sea EBSA and the North-Western Mediterranean Pelagic Ecosystems EBSA. Both areas have been recognised as EBSAs based, in part, on the recorded high density of several species of whale, amongst other large pelagic animals (sharks, dolphins, sea turtles and tuna fish). Whales are demonstrably vulnerable to ship strikes and underwater noise (Erbe *et al.*, 2019), and there are growing data holdings that would facilitate the prioritisation of localised higher-risk areas (Agardy *et al.*, 2019; MMPATF, 2019). There is general consensus amongst scientists for the recommendation of IMO measures, such as routing measures or

vessel speed limits, to be put in place to minimise the frequency and impact of ship strikes and ship noise on whales and other large pelagic species (Lyons, 2019).

DISCUSSION

The brevity of the description of each case study highlighted here might suggest that once PSSA criteria have been met and the vulnerability of attributes to international shipping has been presented, the PSSA application and approval process is clear and straightforward, with the eventual designation inevitable. However, the effort required to provide reliable information to describe each applicable criterion, to isolate and quantify the specific threats and risks posed by international shipping to any valued attribute (especially in the fortunate absence of a major incident that demonstrates it), and to justify APMs which will inevitably incur a cost on the international shipping industry and to the implementing Port State, is a laborious, thorough and time-consuming undertaking that draws on expertise from an eclectic pool of experts.

It is also apparent that the IMO is not acting in isolation; there are several other UN agencies and NGO initiatives producing and amassing relevant and reliable information that can contribute towards the recognition and description of ecological, socio-economic, cultural heritage or scientific attributes (Table 1) and can attest to their vulnerability to international shipping.

UNESCO’s World Heritage Convention (WHC) has been a pioneering champion of nature conservation and the preservation of cultural heritage, and has proactively encouraged its members, where appropriate, to engage with the IMO with regard to reducing the risk from international shipping on its listed holdings. To date, the WHC protects waters within or adjacent to six of the 15 PSSAs worldwide, including Papahānaumokuākea (USA), Malpelo Fauna and Flora Sanctuary (Colombia), Galápagos

Islands (Ecuador), Everglades National Park (USA), Wadden Sea (Denmark, Germany, Netherlands) and the Great Barrier Reef (Australia). Freestone *et al.*, 2016 consider whether the WHC could be applied in ABNJ; if so, other significant locations, such as the Sargasso Sea, may be eligible for PSSA designation.

The Worldwide Fund for Nature (WWF) also has a strong record in engaging with the PSSA process in support of its own Marine Priority Places. Other agencies and initiatives are steadily becoming more aware of how they can complement each other’s work. A common criticism of UN agencies is that even though each has its specific sectoral responsibilities, their synergies have not been fully explored or exploited. In 2015, WWF submitted a paper to MEPC (Butt and Wright, 2015) highlighting the potential for the use of EBSA criteria to aid in the review of existing PSSAs, or in the identification of prospective PSSAs, with the aim to enhance the PSSA designation process. The 321 EBSAs described to date provide a repository of locations where it would be prudent to assess the potential impacts of international shipping. It is worth noting, however, that not all EBSAs lend themselves to consideration, as those describing dynamic or ephemeral features (as opposed to static or multi-site features) may be incompatible with the implementation of typical IMO measures. Nevertheless, IMO parties could consider temporally applied APMs or the provision of additional observers on vessels in specific areas during periods known to be important for certain recurring phenomena (*e.g.*, seasonal migration routes, winter feeding areas, cyclical productivity hotspots).

Another avenue of exploration is to overlay shipping traffic density (Halpern *et al.*, 2019) on a map of the EBSA holdings and identify potential areas of high risk or vulnerability. A good example of the results from this exercise is the EBSA off the southern coast of Sri Lanka (The Southern Coastal and Offshore Waters between Galle and Yala National Park EBSA) where

Table 1. Eight initiatives that recognise important marine areas (adapted from Gownaris *et al.*, 2019).

Criterion	UN initiative					NGO initiative		
	PSSA	WHC	EBSA	Ramsar	VME	IBA	IMMA	WWF
Unique	■	■	■	■	■	■	■	■
Threatened	■	■	■	■	■	■	■	■
Life stage	■	■	■	■	■	■	■	■
Vulnerable	■	■	■	■	■	■	■	■
Productive	■	■	■	■	■	■	■	■
Biodiverse	■	■	■	■	■	■	■	■
Natural	■	■	■	■	■	■	■	■
Structural	■	■	■	■	■	■	■	■
Geomorphology	■	■	■	■	■	■	■	■
Impacted	■	■	■	■	■	■	■	■
Dependency	■	■	■	■	■	■	■	■
Heritage	■	■	■	■	■	■	■	■
Research	■	■	■	■	■	■	■	■
Sub-species	■	■	■	■	■	■	■	■

PSSA (IMO); WHC (UNESCO); EBSA (CBD); Ramsar (Convention on Wetlands, Ramsar Sites); VME (FAO); IBA (BirdLife International); IMMA (Marine Mammal Protected Areas Task Force); WWF (Worldwide Fund for Nature Marine Priority Places). *NB*: criterion names have been severely simplified for brevity.

a resident population of blue whales is coincident with heavy shipping traffic. Results such as this are in the process of being assessed further.

Despite the apparent globalization of information and the willingness to cooperate amongst agencies, compatibility of data across applications is still problematic, and opportunities to cross-fertilize expertise are limited. By facilitating and contributing to this review exercise, the Global Ocean Biodiversity Initiative (GOBI; www.gobi.org) has striven to foment meaningful dialogue and progress. The legal requirement for precedent, together with the scientific burden of proof necessary to demonstrate specific direct impacts of singular activities related to international shipping on particular vulnerable features in an overcrowded ocean, remain a challenge.

CONCLUSIONS

Comparing area-based management tools such as those presented here provides an opportunity to apply criteria generated by different conservation processes to achieve a 'best practice' example of marine governance, where the remits of UN agencies are shown to coincide and complement each other. Cooperation amongst agencies can provide for better protection and awareness-raising of the value of unique marine ecosystems.

Currently (November 2019), according to the IUCN World Database on Protected Areas (www.protectedplanet.net), 7.5% of the global ocean is covered by protected areas. Waters falling within national jurisdictions represent 39.0% of the global ocean, and of that, 17.4% is covered by protected areas. Seeking synergies amongst agencies could provide the opportunities needed to reach or exceed the targets set by UN SDG 14.5 and CBD Aichi Target 11. In addition, working with industry as part of an ecosystem-based approach recognising interconnected natural and societal systems could spur efforts to reverse the evident decline of ocean health. Opportunities associated with more transparent data sharing (e.g., ships' automatic identification system (AIS) data including vessel types) can facilitate better and more systematic conservation planning.

ACKNOWLEDGMENTS

The Global Ocean Biodiversity Initiative (GOBI) is supported by the International Climate Initiative (IKI). The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

LITERATURE CITED

- Agardi, T.; Cody, M.; Hastings, S.; Hoyt, E.; Nelson, A.; Tetley, M., and Notarbartolo di Sciarra, G., 2019. Looking beyond the horizon: An early warning system to keep marine mammal information relevant for conservation, *Aquatic Conservation: Marine and Freshwater Ecosystems* 29(S2): 71-83.
- BirdLife Factsheet, 2019. http://datazone.birdlife.org/userfiles/file/sowb/flyways/4_East_Atlantic_Factsheet.pdf
- Butt, N. and Wright P., 2015. *Protecting EBSAs and opportunities for the IMO: The use of EBSAs for informing designation of IMO PSSAs*, A report compiled for the WWF, 23p.
- CBD, 2014. *Marine and coastal biodiversity: ecologically or biologically significant marine areas (EBSAs)*, Convention on Biological Diversity Decision 12/22, 59p.
- CBD, 2016. *Marine and coastal biodiversity: ecologically or biologically significant marine areas*, Convention on Biological Diversity Decision 13/12, 35p.
- CBD, 2018. *Protected areas and other effective area-based conservation measures*, Convention on Biological Diversity Decision 14/8, 19p.
- Diz, D.; Johnson, D.; Riddell, M.; Rees, S.; Battle, J.; Gjerde, K.; Hennige, S., and Roberts, J.M., 2018. Mainstreaming marine biodiversity into the SDGs: The role of other effective area-based conservation measures (SDG 14.5). *Marine Policy* 93, 251-261.
- Dunion, J.P. and Velden, C.S., 2004. The impact of the Saharan Air Layer on Atlantic tropical cyclone activity. *Bulletin of the American Meteorological Society* 85(3), 353-365.
- Erbe, C.; Marley, S.A.; Schoeman, R.P.; Smith, J.N.; Trigg, L.E., and Embling, C.B., 2019. The Effects of Ship Noise on Marine Mammals – A Review, *Frontiers in Marine Science* 6, 606
- Freestone, D.; Laffoley, D.; Douvère, F., and Badman, T., 2016. *World Heritage in the High Seas: an Idea Whose Time Has Come*, UNESCO World Heritage Reports 44, 79p.
- Gownaris, N.J.; Santora, C.M.; Davis, J.B., and Pikitch, E.K., 2019. Gaps in Protection of Important Ocean Areas: A Spatial Meta-Analysis of Ten Global Mapping Initiatives, *Frontiers in Marine Science* 6: 650.
- Halpern, B.S.; Frazier, M.; Afflerbach, J.; Lowndes, J.S.; Micheli, F.; O'Hara, C.; Scarborough, C., and Selkoe, K.A., 2019. Recent pace of change in human impact on the world's ocean. *Nature Scientific Reports* 9: 11609
- Hoeksema, B.W., 2007. Delineation of the Indo-Malayan centre of maximum marine biodiversity: The Coral Triangle. In: Renema, W. (ed.), *Biogeography, time, and place: distributions, barriers, and islands*. Dordrecht, The Netherlands: Springer, pp. 117-178.
- IMO-MEPC, 2014. *Protection of the Tubbataha Reefs Natural Park and World Heritage Site*, International Maritime Organization Marine Environment Protection Committee document MEPC 67/INF.25, 5p.
- IMO-MEPC, 2016. *Protection of Banc d'Arguin National Park World Heritage Site and an adjacent sea area*, International Maritime Organization Marine Environment Protection Committee document MEPC 69/INF.19, 7p.
- IMO-MEPC, 2017. *Designation of the Tubbataha Reefs Natural Park as a Particularly Sensitive Sea Area*, International Maritime Organization Marine Environment Protection Committee Resolution 294(71)/17/Add.1 Annex 18, 21p.
- IMO, 2006. *Revised guidelines for the identification and designation of Particularly Sensitive Sea Areas*. International Maritime Organization Resolution A.982(24), 6 February 2006, 13p.
- IMO, 2017. *Routeing measures other than traffic separation schemes*, International Maritime Organization notice SN.1/Circ.335 Annex 3, 1p.
- Jernelöv, A., 2010. The Threats from Oil Spills: Now, Then, and in the Future. *Ambio* 39(5-6): 353-366.
- Johnson, D.E.; Barrio Froján, C.; Turner, P.J.; Weaver, P.; Gunn, V.; Dunn, D.C.; Halpin, P.; Bax, N.J., and Dunstan, P.K., 2018. Reviewing the EBSA process: Improving on success. *Marine Policy* 88, 75-85.

-
- Lyons, Y., 2019. *EBSAs to inform application for IMO Measures*, A report for GOBI and WWF, 79p.
- Marine Mammal Protected Areas Task Force (MMPATF), 2019. <https://www.marinemammalhabitat.org>
- Miller, E.C.; Hayashi, K.T.; Song, D., and Wiens, J.J., 2018. Explaining the ocean's richest biodiversity hotspot and global patterns of fish diversity. *Proceedings of the Royal Society B* 285: 20181314.
- UN, 2015. Transforming our World: The 2030 Agenda for Sustainable Development. United Nations General Assembly Resolution 70/1, 35p.