INTERNATIONAL JOURNAL OF LEGAL SCIENCE AND INNOVATION

[ISSN 2581-9453]

Volume 7 | Issue 2

2025

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Law Beneath the Waves: Enforcing Global Efforts to Protect High Seas Biodiversity

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ABSTRACT

Ocean being the most beautiful resource of the world and has been admired from the ancient period. And marine biodiversity playing a vital role in balancing the economic This paper discusses on how the contemporary issues of overfishing, pollution, habitat destruction, and climate change pose serious challenges to its preservation. For example, Bluefin Tuna is a fish which is considered as a most expensive one. In Japan this is sold for the food sushi. This one fish can grow for 1500 pounds, which can make around $45000 per day. And being the most eaten dish of the country which make the demand in fish market. So, because of these fishers are starting to do overfishing in Atlantic Ocean which makes the sustainability for the sea creatures hard. Even when there are many solutions under the international legal domain. There are many frameworks like United Nations Convention on the Law of the Sea (UNCLOS) and the Convention on Biological Diversity (CBD), but still there are many gaps for international law needs to fill and the major one is the national jurisdiction. This paper deals with the evolving legal solutions for the protection of the marine environment in international law like BBNJ agreement and other instruments. Through a study of existing legal frameworks, case studies, and existing literature, this research relates key challenges, including jurisdictional conflicts, weak enforcement mechanisms, and the lack of global cooperation. The paper argues about the emergency need for the strong policy reforms and at developing legal protections and promoting sustainable development practices. This research highlights the importance of a consistent, collective approach for protecting marine biodiversity for future generations.

Keywords*: Marine Biodiversity; High Seas; BBNJ Agreement; International Environmental Law; Marine Protected Areas (MPAs).*

I. INTRODUCTION

"We should preserve every scrap of biodiversity as priceless while we learn to use it and come to understand what it means to humanity."

As stated by ***E. O. Wilson***, prominent biologist, and conservationist[2]. Marine biodiversity which is being violated in recent years are in the need for some safety measures from being

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[2] Edward O. Wilson, The Diversity of Life (Harvard Univ. Press 1992).

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violated more by people in the world. Oceans offer the protection for coastal areas from facing natural disaster[3]. Because of the causes like overfishing, pollution, habitat destruction, and climate change there are disturbance in the marine ecosystem and disturb the sea creatures which is now in lack of peace full life which also includes shift in species' natural environments and sometimes create entirely new ecosystems whose long-term effects are still not found[4]. And, the services they provide like climate control fisheries, and coastal protection — are also at risk[5]. To stop all these issues international organizations have established legal frameworks such as United Nations Convention on the Law of Sea (UNCLOS)[6] and the convention on Biological Diversity (CBD)[7]. These frameworks have aim to protect marine biodiversity by controlling the use of marine resources and promoting the conservation efforts.

However, these enforcements are still weak and have conflicts over maritime boundaries, jurisdictions and national interests often work slower the effectiveness of the implications[8]. Recent developments like High Seas Treaty shows very slow progress, but more comprehensive and collaborative efforts are still needed[9]. Marine biodiversity is facing many challenges even when there are laws to protect it and making the laws and making it work is very hard. Issues like weak enforcement, lack of cooperation between countries, and unclear boundaries make it very harder to protect the ocean life[10]. By looking at both the current and new legal frameworks, we can find some ways to improve the way we protect the marine life and help to keep our oceans healthy for the future[11].

II. UNDERSTANDING MARINE BIODIVERSITY AND THE LAW

Marine biodiversity is a huge concept which cannot be measured and not even is fully sourced which includes life forms like microscopic organisms to large marine mammals[12]. These marine ecosystems are very essential for the planet's health which provides food, oxygen,

[3] Intergovernmental Panel on Climate Change, Special Report on the Ocean and Cryosphere in a Changing Climate (2019), https://www.ipcc.ch/srocc/.
[4] id
[5] United Nations Environment Programme (UNEP), Marine and Coastal Ecosystems and Human Well-Being: A Synthesis Report Based on the Findings of the Millennium Ecosystem Assessment (2006),
[6] United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 3.
[7] Convention on Biological Diversity, June 5, 1992, 1760 U.N.T.S. 79.
[8] David Freestone, Ocean Governance and the High Seas: Issues and Opportunities, 27 Int'l J. Marine & Coastal L. 283 (2012).
[9] High Seas Treaty, U.N. Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ), 2023.
[10] Kristina M. Gjerde et al., Protecting Earth's Last Conservation Frontier: Scientific, Management and Legal Priorities for MPAs Beyond National Boundaries, 20 Aquatic Conservation. Mar. Fresh. Ecosystem. 232 (2010).
[11] Barbara Neumann & Sylvia Unger, Options to Address the Challenges in Marine Biodiversity Protection, 11 Marine Policy 118 (2021).
[12] Sylvia A. Earle, The World Is Blue: How Our Fate and the Oceans Are One (National Geographic 2009).

climate control and coastal protection[13]. At the global level saving this marine biodiversity have become a biodiversity has become a major priority especially because of the increasing threats such as overfishing, habitat loss and pollution[14].

To view these threats, public international law has a played a crucial role in making principles and agreements for these protection and sustainable usage of the marine environment[15]. There two fundamental concept that support these legal frameworks are the *preventive principle* and *sustainable development*[16].

The preventive principle is used when there is a risk of serious environmental harm, should take action to protect it—even if there is no complete scientific proof yet. This principle is used when the impact is very large, long-lasting and irreversible[17]. The principle of sustainable development will focus on balancing the environmental protection in relation to social and economic needs[18]. Together, these legal works have been a foundation on how international agreements are formed and made it into action for protecting the marine environment. These works serve as a strong tool for countries when creating policies, setting saving goals and enforcing marine protection laws. And, to maintain marine governance with strong legal foundation[19].

III. INTERNATIONAL LEGAL INSTRUMENTS GOVERNING THE PROTECTION OF MARINE BIODIVERSITY IN AREAS BEYOND NATIONAL JURISDICTION

(A) United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS is a system that is overseeing all the things concerning sea exercises. It gives states with rights and obligations over distinctive marine zones, which incorporates tall oceans, and builds up preservation standards for the marine biodiversity[20]. In these words, UNCLOS not one or the other gives authorization activity for biodiversity past national purview (BBNJ) nor offers a constraining system[21]. Instep, it gives a premise for future arrangements and agreeable courses of action since the common obligation to secure the marine environment and moderate

[13] National Oceanic and Atmospheric Administration (NOAA), Why Should We Care About the Ocean, https://oceanservice.noaa.gov/facts/why-care-about-ocean.html.
[14] Food and Agriculture Organization (FAO), The State of World Fisheries and Aquaculture (2022), https://www.fao.org/3/cc0461en/online/cc0461en.html.
[15] Patricia W. Birnie, Alan E. Boyle & Catherine Redgwell, International Law and the Environment (3d ed. 2009).
[16] Philippe Sands & Jacqueline Peel, Principles of International Environmental Law 218–221 (3d ed. 2012).
[17] Id.at 220.
[18] U.N. General Assembly, Report of the World Commission on Environment and Development: Our Common Future (Brundtland Report), U.N. Doc. A/42/427 (1987).
[19] David Freestone, International Governance and the Marine Biodiversity of Areas Beyond National Jurisdiction, 27 Int'l J. Marine & Coastal L. 191 (2012).
[20] United Nations Convention on the Law of the Sea art. 192, Dec. 10, 1982, 1833 U.N.T.S. 397.
[21] Id. art. 137.

the living assets was built up[22]. UNCLOS is too exceptionally critical in characterizing sea zones, in this manner permitting states to connect beneath universal lawful systems to manage marine resources[23].

(B) UN Fish Stocks Agreement (UNFSA), 1995

The ultimate goal of the UNFSA is to provide a more specialized framework within the wider UN Convention on the Law of the Sea for the sustainable management of straddling and high migratory fish stocks[24]. In furtherance of this goal, it upholds precautionary and ecosystem-based fisheries and calls for cooperation among states through regional fisheries management bodies (RFMOs)[25]. It also regulates fishery resources beyond national jurisdiction, as well as data-sharing and measures to prevent illegal, unregulated and unreported (IUU) fishing. It strengthens the provisions concerning conservation of marine biodiversity in areas beyond national jurisdiction in that all the aspects of fish stocks and their associated ecosystems, and their responsible management across borders, are well provided for[26].

(C) Convention on Biological Diversity (CBD), 1992

The CBD is a universal settlement pointed at the conservation of biodiversity, feasible utilization of biodiversity's components, and reasonable sharing of benefits emerging from the utilization of hereditary assets[27]. Indeed, if cantered generally on arrive, the CBD applies to marine biodiversity as well, counting zones past national purview. It gives for the foundation of marine ensured regions (MPAs), natural affect appraisals, and worldwide participation. The conventions like the Nagoya Convention make arrangement for benefit-sharing and get to to hereditary marine assets[28]. The CBD is playing a key part in worldwide discourses on tall oceans biodiversity administration and is championing the transactions for the unused BBNJ arrangement[29].

[22] Id. art. 192–194.
[23] See David Freestone, The Law of the Sea Convention at 30: Successes, Challenges and New Agendas, 109 AJIL Unbound 269 (2015).
[24] Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks art. 2, Sept. 8, 1995, 2167 U.N.T.S. 88 [hereinafter UNFSA].
[25] Id. art. 6.
[26] Id. art. 10–11.
[27] Robin Churchill, Managing Straddling Fish Stocks in the North-East Atlantic: A Multiplicity of Instruments and Regime Linkage but How Effective? 22 Int'l J. Marine & Coastal L. 497 (2007).
[28] Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, Oct. 29, 2010, 1760 U.N.T.S. 79.
[29] Elisa Morgera, The CBD and the Nagoya Protocol: Intellectual Property, Access and Benefit-Sharing, and Beyond, 21 Rev. Eur. Comp. & Int'l Envtl. L. 164 (2012).

(D) International Whaling Convention (IWC), 1946

The IWC was formed under the International Convention for the Regulation of Whaling which is made make sure about the whale populations and regulate the whaling activities[30]. This convention has made a global moratorium on commercial whaling and created some whale sanctuaries for e.g. Indian Ocean Sanctuary. Even though this is limited for whales but also ensures about protecting the other marine creatures also. It also contributes to the marine biodiversity research. It also showcases how the specific species can have effect from this protection.

(E) CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), 1973

Universal exchange takes put in risked species controlled by CITES, which incorporates numerous marine life forms such as sharks, ocean turtles, and corals. It works through an appendix-based posting framework that controls exchange through licenses to anticipate over-exploitation[31]. CITES is vital in reducing the unlawful exchange in marine natural life and improves preservation actions by easing weight on powerless marine masses. Although not pointed at tall oceans, the effect of CITES is felt in worldwide marine biodiversity preservation by destroying all roads of hurtful misuse of species over horizons, counting those uncommon to the tall oceans.

IV. CHALLENGES IN PROTECTING MARINE BIODIVERSITY ON THE HIGH SEAS

Protecting marine lives in high seas is very difficult. High seas are not owned by any specific country, so no countries take the entire responsibility for the care of the marine environment. In seas there are many problems and solving all those are not easy.

The major issues are that there is no authority to take care of these seas. Many different organizations lie for shipping or fishing have their own rules, but they don't work together in seas. So, this makes this hard to protect the whole marine society. For e.g. there might be certain fishing but no rules to protect marine animals or their homes[32].

Insufficient scientific research and information also presents a problem. Many sections of the deep ocean are still unexplored[33]. Scientists do not yet know exactly how many species live

[30] International Convention for the Regulation of Whaling art. V, Dec. 2, 1946, 161 U.N.T.S. 72.
[31] Convention on International Trade in Endangered Species of Wild Fauna and Flora art. III–V, Mar. 3, 1973, 993 U.N.T.S. 243.
[32] Kristina M. Gjerde et al., Regulatory and Governance Gaps in the International Regime for the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction, IUCN Marine Series No. 1 (2008).
[33] UNESCO, The Deep Ocean: Earth's Final Frontier (2020), https://www.unesco.org.

there or how the different ecosystems work. Without this knowledge, smart decisions for protection are difficult[34]. Additionally, this slows down the proper establishment of international rules and agreements.

Another big challenge is illegal and free fishing. Many boats fish here without any permission at all. They take out excessive amounts from the sea and throw nature's balance in the ocean out of blow[35]. Some fishes especially tuna and sharks are hunted to extinction[36]. Countries find it challenging to monitor or control these illegal practices due to extreme remoteness of the areas. Climate change constitutes an additional cause of threats to marine biodiversity. The increase in ocean temperature affects habitats and distributions of marine animals. Coral reefs are dying while other species are relocating[37]. Some marine zones are undergoing low oxygen concentration that interferes with survival by marine organisms. The direct effects are being felt throughout the globe; therefore, no single country can set off to remedy the situation. Increased industries like deep-sea mining are presently attempting to take resources from the floor of the ocean. Yet this would destroy ecosystems, most of which we do not comprehend yet[38]. Some ecosystems might have to suffer total annihilation to achieve actual restoration. Adding to that, land-polluting plastics and other waste make their way to the oceans[39]. Such pollutants kill marine animals and contaminate the food web.

The geographic variations and textural variability demonstrate that it requires much time to write and intervene upon international treaties and agreements. A good example is the new High Seas Treaty (also called the BBNJ Agreement), which is a great step forward but has still yet to be ratified and implemented by many states[40]. Until then, marine biodiversity suffers. Even where regulations exist, enforcement is often weak due to resource scarcity and lack of political will. There are also encumbrances in negotiations varying from nation to nation. Some parties wish to conserve nature while others prefer that ocean be developed economically. Wealthy and impoverished nations may hold differing opinions[41]. These differences stand in the way of forging common resolutions and slow down the opportunity to protect the high seas.

And lastly, the deep-sea corridors are not so familiar to politicians and the public. Like all

[34] See Richard C. Murphy, The Fragile Edge: Diving and Other Adventures in the South Pacific (2006).
[35] Douglas J. McCauley et al., Ending Hide and Seek: The Future of Fishery Transparency, 10 Sci. Advances (2024).
[36] Pew Charitable Trusts, Protecting Pelagic Sharks and Rays in the High Seas (2022).
[37] Intergovernmental Panel on Climate Change (IPCC), Special Report on the Ocean and Cryosphere in a Changing Climate (2019).
[38] International Seabed Authority, Deep-Seabed Mining and Biodiversity Conservation (2021).
[39] UNEP, From Pollution to Solution: A Global Assessment of Marine Litter and Plastic Pollution (2021).
[40] United Nations, Agreement Under UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ), A/CONF.232/2023/4.
[41] Daniel Bodansky, The Art and Craft of International Environmental Law 248–53 (2010).

things high seas, the public hardly apply pressure to governments for anything high seas. Nothing whatsoever compares to more tangible things-such as forests or rivers-visible or usable in value-given more than far distant oceans, very much more is accessible or directly of high interest to them: The high seas are far beyond the naked eye, and their state affairs of this kind crumble under the ignorance of importance. Protecting marine biodiversity in the high seas is indeed a very complex task. Merely scientific, legal and political issues are not sufficient to understand the gravity of the problem; but there is also a touch of the social dimension in the problem. Countries will need to collaborate much more and put pooling of ideas with strong action in trying to find solutions. More research, more legal improvements, increased monitoring, and supporting public participation are really called for. That part of the ocean could remain forever unprotected, and damage may happen that cannot be reversed; the losses are going to be for both nature and generations.

V. CASE STUDIES: SUCCESS STORIES IN MARINE BIODIVERSITY PROTECTION

These are some major cases which shows even when there are some challenges, the legal framework has worked out successfully throughout the globe.

(A) The Great Barrier Reef Marine Park, Australia:

Great Hedge Coral Reef laid in Australia is one of the most noted and different ecosystems on the Earth. It has been suffering from severe dangers like over-fishing, tourism, and the result of climate changes from the last many decades. To guard it, the government of Australia has set up a Great hedge Reef Marine Park in the time 1975[42]. This is marked as one of the first and largest cases of a marine defended area (MPA). The system of zoning is developed on scientific studies and public input. Over time, it has refined coral- cover and fish population benefits within the defended zones, especially the no- take areas[43]. There were established strict rules that were part of the operation of all-natural conditioning like fishing, shipping, or tourism, while some zones were fully closed to fishing and diligence to allow for natural development of marine life.

After all these efforts there was a little bit success, by the Great Barrier Reef Marine Park Authority (GBRMPA) and there was an active community participation. Apart from that there were some programmes launched to raise awareness among tourists and locals. Even after all these climate changes is still an issue and this case proves that effective law, science-based planning and stakeholder engagement will protect marine ecosystems.

[42] Great Barrier Reef Marine Park Act 1975 (Cth) (Austl.).
[43] Great Barrier Reef Marine Park Authority, Zoning, Permits and Plans, https://www.gbrmpa.gov.au.

(B) Galápagos Marine Reserve, Ecuador:

The Galápagos Islands are well known for their rare and different variety of species. But the marine area surrounded by them was once affected very badly by illegal fishing and because of vast tourism. To protect these fragile ecosystems, Ecuador created the **Galápagos Marine Reserve** in 1998 which is the largest reserve in the world.

This reserve became strong because of laws and community support. The government has set clear limits for fishing and banned larger scale fishing inside the reserve[44]. Local fishers were trained in eco-friendly way and has rights to fish in sustainable way which has now reduced conflicts.

To prevent all these illegal activities, patrol boats and monitoring systems were introduced. And these reserves are managed by the team which consist of scientists, government officials, and local people. With all these efforts marine animals like sharks, turtles, and sea lions began to recover. This case proves that including local communities in making conservation can make the success long-lasting.

(C) Papahānaumokuākea Marine National Monument, USA:

Near Hawaii, the Papahānaumokuākea Marine National Monument is one of the largest marines which is a protected area in the world. This monument was first established in 2006 and expanded in 2016[45], right now it covers over 1.5 million square kilometres.

This area is home for many rare marine species like the Hawaiian[46]. Monk seal and for some endangered sea turtles. The U.S government has banned commercial fishing and mining in those areas to protect its ecosystems.

The site is managed by U.S agencies, native Hawaiian groups, and scientists working together. Strict rules and also no-take zones helped marine life thrive, and many new species have been discovered here. This case shows that when cultural values and conservation goals are combined, the result has been truly powerful.

VI. RECOMMENDATIONS FOR BETTER PROTECTION OF MARINE BIODIVERSITY ON THE HIGH SEAS

Protect marine biodiversity beyond national borders is a huge and important task, but there are

[44] Galápagos Marine Reserve Act, 1998 (Ecuador).
[45] Proclamation No. 8031, Establishment of the Papahānaumokuākea Marine National Monument, 71 Fed. Reg. 36,443 (June 15, 2006).
[46] Nat'l Oceanic & Atmospheric Admin., Papahānaumokuākea Marine National Monument, https://www.papahanaumokuakea.gov.

many was we can make the present things better.

(A) Speedy Implementation of the BBNJ Agreement:

- The BBNJ treaty takes us forward, but that is not enough; it calls for the speediest and strongest implementation. The countries should now:
- Confirm the treaty at the earliest as possible.
- Make national laws and policies that are in line with the agreement.
- Establish appropriate criteria for identifying and managing the marine protected areas, MPAs.
- Provide a fair decision-making system which should be based on science[47].

(B) Strengthen Monitoring and Enforcement:

- Making rules is not enough. But following them is also very important by making proper system
- Using satellite tracking and some modern tech to watch the remote areas.
- Data should be shared between the countries and agencies are made to catch illegal fishing or mining.
- Build capacity in developing countries so they can also monitor and enforce[48].

(C) Involve Indigenous and Local Communities:

- Far removed from most people, the ocean still holds cultural ties for some communities (for instance, the Pacific Islanders) in regards to the high seas. Indeed, their knowledge could greatly benefit us. So, we should:
- Include the traditional knowledge holders in planning and decision-making.
- Always protect their rights and cultural practices in global negotiations.
- Whenever it is possible, support conservation programs led by such communities[49].

[47] United Nations, Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (2023) [BBNJ Agreement].
[48] Global Fishing Watch, How Satellite Technology is Changing Ocean Monitoring (2022), https://globalfishingwatch.org.
[49] Joshua Cinner et al., Incorporating Social-Ecological Dynamics in Marine Conservation, 20 Curr. Biol. R684 (2019).

(D) Promote Sustainable Use of Marine Resources:

- We have a requirement to adjust the preservation with capable utilize.
- Regulating businesses like shipping and angling it way more strictly.
- Encouraging the eco-friendly options such as low-impact angling gear.
- Making companies responsible for natural harm caused on the tall oceans[50].

(E) Reduce Plastic and Chemical Pollution:

- Pollution from the land and ships are most of the time find its way into the open ocean, which is very injurious to the marine life. To relieve this:
- Implement more stricter rules against sea pollution.
- Promote plastic-free shipping and packaging even for import and exports.
- Support all-inclusive cleanup projects worldwide[51].

(F) Raise Public Awareness:

- Most of the general population does not know about the situation beyond the high seas. Awareness can do:
- Opening international campaigns in relation to the marine biodiversity and its threats.
- Utilizing social media, documentaries, and education programs to raise awareness on the pollution related to marine biodiversity.
- Encouraging youth and student involvement in ocean conservation activities[52].

VII. CONCLUSION

Protecting the marine biodiversity in international borders is very crucial for our planet's health. These borders are rich in life, but it also faces serious threats like overfishing, pollution, and climate change[53]. International efforts like the BBNJ Agreement and marine protected areas offers hope, but still stronger cooperation and enforcement is still needed[54]. Case studies like the Galápagos Marine Reserve and Papahānaumokuākea shows how the successful

[50] FAO, Guidelines for the Sustainable Use of Marine Living Resources, U.N. Doc. COFI/2020/Inf.7.
[51] United Nations Environment Programme (UNEP), Single-Use Plastics: A Roadmap for Sustainability (2018).
[52] Ocean Literacy Framework, UNESCO, Building Ocean Knowledge through Education (2021), https://oceanliteracy.unesco.org.
[53] Convention on Biological Diversity, June 5, 1992, 1760 U.N.T.S. 79; Intergovernmental Panel on Climate Change, Climate Change and Oceans Report (2019).
[54] Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction, BBNJ Agreement, A/CONF.232/2023/4 (2023); United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 3 [hereinafter UNCLOS].

conservation is only possible when the laws are stronger including communities and science working simultaneously[55]. To ensure a sustainable future, global conservation action must be taken now to safeguard the marine lives for the upcoming generation[56].

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[55] UNESCO, Galápagos Marine Reserve, https://whc.unesco.org/en/list/1; U.S. Fish & Wildlife Service, Papahānaumokuākea Marine National Monument, https://www.fws.gov/refuge/papahanaumokuakea/.
[56] United Nations Environment Programme (UNEP), Global Biodiversity Outlook 5 (2020), https://www.cbd.int/gbo5.