



Expanding efforts to protect marine biodiversity and habitats



Tables of contents

Overview	2
Definition of important terms	4
Timeline of key events	7
Position of key nations	10
Suggested solutions	12



Overview

The world's oceans cover more than 70% of the Earth's surface and play a crucial role in maintaining global biodiversity, climate stability, and economic prosperity. Marine life, constituting around 80% of Earth's biodiversity, supports countless ecosystems, providing food, oxygen, and livelihoods for billions of people. However, human activities such as overfishing, pollution, habitat destruction, and climate change have put immense pressure on marine ecosystems. Reports from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) indicate that over one-third of marine species are at risk of extinction due to these human-induced threats (19) (13) (23) (9).

The decline of marine biodiversity is not just an environmental issue but also an economic and humanitarian crisis. Coral reefs, which support about 25% of marine life, are bleaching at unprecedented rates due to rising ocean temperatures. In 2005, for example, the United States lost half of its coral reefs in the Caribbean sea in one year (21). In addition, overfishing has led to the depletion of vital fish stocks, endangering food security for millions of people, particularly in developing nations. This potential collapse of the fishing industry may also directly affect at least 10% of the global population that relies on fishing, or aquaculture, for livelihoods (14). Moreover, the increasing CO₂ emissions are causing ocean acidification which weakens marine organisms fundamental to the food webs like oysters and plankton, endangering the whole ecosystem (20).



While multiple international agreements, such as the United Nations Convention on the Law of the Sea (UNCLOS) and the Convention on Biological Diversity (CBD), aim to protect marine life, enforcement remains weak (32) (27). The establishment of Marine Protected Areas (MPAs) has helped slow biodiversity loss, but illegal, unregulated, and unreported (IUU) fishing, plastic pollution, and climate change continue to pose significant threats. The international community must take stronger, coordinated action to protect marine biodiversity before irreversible damage occurs.



Definition of Important Terms

Marine Biodiversity:

The variety of life in the ocean including all animals, plants, and microorganisms (13). Marine biodiversity is critical in sustainable economic, social, and environmental development due to its significant impact on the planet's and humanity's well-being (30). The ocean supplies around half of Earth's air and cleans 26% of CO₂ human population emitted every year (29) (26). Thus, it is crucial for all nations to unite and aim to protect marine biodiversity and habitat.

Marine Protected Areas (MPAs):

Clearly defined marine regions designated and managed through effective methods to preserve marine resources, ecosystems services, and cultural heritage for long-term conservation (12) (22). MPAs are further classified based on the regulating level of extraction and entrance access (11). Highly restricted areas are labeled as "marine reserve" or "no-take MPAs," prohibiting any forms of extractive activities such as fishing or kelp-harvesting (15). MPAs attempt to protect marine habitats and restore biodiversity through restriction of human activities, therefore being one of the effective solutions for the increasing degradation of marine ecosystems.



Overfishing:

The practice of harvesting fish at a rate that exceeds their natural reproduction, leading to depletion and potential collapse of fish populations (14). The main cause of overfishing is poor fishing management that allows illegal, unreported, and unregulated (IUU) fishing, but there are other factors in play including rising consumption, climate warming, fishing subsidies, and others. The rate of this concerning practice is increasing each year, with over 37% of global fish stock being products of overfishing (8). Oceans like the Gulf of Mexico implemented fishing rights to promote sustainable fishing and reduce the industry's impact on marine ecosystems (16).

Coral Bleaching:

Bleaching, or whitening, of corals due to changing sea temperature (21). Warmer or colder sea water causes corals to expel symbiotic algae known as zooxanthellae from their body, increasing the stress level and reducing its lifespan. In recent years, Coral bleaching has been observed on a large scale in many areas such as the Caribbean sea which lost half of its corals in 2005. It is imperative to address the issues regarding climate change as it poses long-term threats to coral reef ecosystems.



Eutrophication:

Process of pollution in marine ecosystems due to excess nutrients (ex: nitrogen and phosphorus) from agricultural runoff, sewage discharge, and industrial waste, leading to harmful algal blooms and oxygen depletion (6). Eutrophication destroys the water body's biodiversity, transforming the area into a dead zone where life is absent. One example is the Gulf of Mexico which has the 12th largest dead zone in the past few decades. Unregulated agricultural runoff of chemical fertilizers and animal manures from the Mississippi River caused seasonal oxygen depletion, devastating local fisheries and ecosystem (17). Therefore, enforcing strict nutrient management and drainage practice has become crucial to resolve the ongoing issue of eutrophication (34).



Timeline of Key Events

10 December 1982: Adoption of the United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS established a comprehensive legal framework governing maritime rights, conservation, and resource management of 169 nations and the European Union (32). The treaty introduced policies like Exclusive Economic Zones (EEZs) which gave states exclusive rights to explore, use marine resources including energy production, and scientific research in order to protect marine biodiversity. Although the enforcement of UNCLOS is challenged as numerous countries struggle to combat IUU and pollution, its significance persists because UNCLOS was the first international agreement in the systemization of maritime laws (2).

22 May 1992 – The Earth Summit and Convention on Biological Diversity (CBD)

The CBD, signed at the Earth Summit in Rio de Janeiro, aimed to conserve biological diversity, including marine ecosystems (3). It led to the development of national biodiversity strategies and action plans including incentives for the conservation of marine biodiversity, sharing results of genetics research and development with other parties, and raising public awareness regarding threats of biodiversity. Since then, CBD has been hosting expert workshops for sustainable use of marine resources and modifying descriptions of MPAs. However, compliance has been



inconsistent. CBD is currently facing criticism for its failure to enforce strict regulations on nations breaking the treaty's agreements (7).

October 2010 – Establishment of the Aichi Biodiversity Targets

The Aichi Targets, under the CBD, aimed to safeguard marine biodiversity by addressing the causes of biodiversity loss, reducing man-made pressures, promoting sustainable use of natural resources, and enhancing benefits of biodiversity systems by the year 2020 (4). In fact, the Aichi Targets introduced solutions to the most crucial threats to marine biodiversity like eutrophication and overfishing, planning to protect at least 10% of coastal and marine areas. While this goal succeeded in increasing awareness of marine conservation, many nations failed to follow the treaty's content due to limited funding and conflicted political will.

September 2015 – Adoption of the United Nations Sustainable Development Goals (SDGs)

The SDGs, or global goals, call to protect planet earth by 2030. Among the 17 SDGs, the 14th one is titled "Life Below Water" and tries to protect marine and coastal areas through ways like marine conservation, sustainable fishing, and pollution reduction. However, SDG 14 has been showing lack of progress and the implementation remains inconsistent among nations (31).

19 June 2023 – Adoption of the High Seas Treaty



The **High Seas Treaty**, under UNCLOS, marked a major step toward protecting marine biodiversity in international waters. It established a legal framework for the creation of Marine Protected Areas in the high seas, closing a significant gap in global ocean governance. The High Seas Treaty established four elemental deals: sharing of Marine Genetic Resources (MGRs), initiating and managing MPAs, conducting Environmental Impact Assessments (EIAs), and transferring marine technology to developing countries for a larger number of nations maintaining this treaty (24). The High Seas Treaty currently aims to protect around 30% of marine species by 2030 (28).



Position of Key Nations

United States

The United States plays a significant role in global marine conservation efforts, advocating for sustainable fisheries, ocean pollution reduction, and the expansion of Marine Protected Areas (MPAs). It has implemented policies like the Magnuson-Stevens Fishery Conservation and Management Act, which has successfully rebuilt many overfished stocks. Additionally, the U.S. has led global efforts against illegal, unreported, and unregulated (IUU) fishing through the Port State Measures Agreement (PSMA). However, political changes and economic priorities sometimes hinder long-term conservation strategies (18).

China

China is the largest seafood producer and consumer in the world, contributing significantly to overfishing and marine pollution. However, in recent years, the government has taken steps to improve sustainable fisheries by imposing seasonal fishing bans and cracking down on IUU fishing. China has also pledged to support global marine conservation through initiatives such as the Belt and Road Initiative's Blue Economy Cooperation, which promotes sustainable ocean resource use. Despite these efforts, concerns remain over its distant-water fishing practices and the environmental impact of its maritime industries (35).



European Union

The European Union (EU) has some of the most comprehensive marine conservation policies, including the Marine Strategy Framework Directive, which aims to maintain healthy marine ecosystems across EU member states. The Common Fisheries Policy (CFP) sets strict quotas and regulations to ensure sustainable fish stocks. The EU also funds large-scale marine research projects and supports international conservation efforts. However, conflicts arise between economic interests and conservation goals, particularly in negotiations over fishing quotas and post-Brexit regulations (5).

Australia

As home to the Great Barrier Reef, Australia has been at the forefront of marine conservation. It has implemented the Reef 2050 Plan, a long-term sustainability strategy to mitigate climate change effects and protect the reef from pollution and coastal development. Australia has also designated extensive Marine Protected Areas to conserve biodiversity. However, climate change-induced coral bleaching and industrial expansion continue to pose major threats, challenging the effectiveness of conservation strategies (33).



Suggested Solutions

1. Strengthening and Expanding Marine Protected Areas (MPAs)

Marine Protected Areas (MPAs) have been instrumental in conserving biodiversity by restricting human activity in ecologically sensitive regions. A prime example is the Great Barrier Reef Marine Park, which has helped regulate tourism and fishing activities to reduce environmental harm. However, MPAs alone cannot address all threats. Enforcement remains a major challenge, especially in developing nations where resources for patrolling protected areas are scarce. While MPAs provide safe habitats for marine life, critics argue that they can displace fishing activities to unprotected waters, exacerbating overfishing elsewhere (12).

2. Combating Illegal, Unreported, and Unregulated (IUU) Fishing

IUU fishing is a major cause of marine biodiversity loss, depleting fish stocks and harming marine ecosystems. The Port State Measures Agreement (PSMA) by the Food and Agriculture Organization (FAO) is one of the most significant global efforts to combat IUU fishing, requiring port inspections and denying access to non-compliant vessels. Countries such as Norway and the United States have effectively implemented strict monitoring systems using satellite tracking and vessel identification technologies. However, in nations with limited enforcement capabilities,



IUU fishing persists. While strict regulations deter illegal fishing, they may impose economic hardships on small-scale fishers who rely on these practices for livelihood (8).

3. Reducing Ocean Pollution Through Plastic Waste Management

Plastic pollution poses an existential threat to marine biodiversity, as microplastics and debris disrupt marine ecosystems. The Global Plastics Treaty, currently under negotiation by the United Nations, aims to create legally binding agreements to reduce plastic production and improve waste management. Countries like Japan and Germany have implemented extensive recycling programs and waste management systems, demonstrating significant reductions in plastic waste entering the ocean. However, developing nations, which often lack sufficient infrastructure, struggle to implement similar policies. While stringent plastic bans can be effective, they may negatively impact industries reliant on plastic production and increase costs for consumers (25).

4. Promoting Climate-Resilient Marine Ecosystems

With climate change accelerating ocean warming, acidification, and extreme weather events, it is crucial to implement climate adaptation strategies. Coral reef restoration projects, such as the Maldives Coral Regeneration Initiative, have shown promise in rehabilitating damaged reefs. Additionally, the adoption of blue carbon ecosystems—such as mangroves and seagrasses that capture and store carbon—has been promoted to mitigate climate impacts. However, such



initiatives require significant funding and long-term commitment. While ecosystem restoration projects help marine life recover, they may not be sufficient to counteract the broader effects of climate change without concurrent global reductions in carbon emissions (1).



Bibliography

1. Blue Marine Foundation. "The Maldives." *Blue Marine Foundation*, 2025, <https://www.blumarinefoundation.com/projects/maldives/>.
2. Capt. Enchev, V. *Fundamentals of Maritime Law*. 2012. ISBN 978-954-8991-69-8.
3. Convention on Biological Diversity. *The Convention on Biological Diversity*, <https://www.cbd.int/convention>.
4. Convention on Biological Diversity. *Strategic Plan for Biodiversity Targets*. <https://www.cbd.int/sp/targets>.
5. European Commission. *EU Marine Strategy Framework Directive*. https://research-and-innovation.ec.europa.eu/research-area/environment/oceans-and-seas/eu-marine-strategy-framework-directive_en.
6. European Environment Agency. "Eutrophication." *European Environment Agency Glossary*, <https://www.eea.europa.eu/help/glossary/other-eea-terms/eutrophication>.
7. Faizi, S. "The Unmaking of a Treaty." *Biodiversity*, vol. 5, no. 3, 2004.
8. FAO. "The State of World Fisheries and Aquaculture 2024." *FAO*, 2024. <https://doi.org/10.4060/cd0683en>
9. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). "Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'." *IPBES*, 6 May 2019, <https://www.ipbes.net/news/Media-Release-Global-Assessment>.
10. Kubiak, Lauren. "Marine Biodiversity in Dangerous Decline, Finds New Report." *Natural Resources Defense Council*, 6 May 2019, <https://www.nrdc.org/bio/lauren-kubiak/marine-biodiversity-dangerous-decline-finds-new-report>.
11. Marine Protected Areas Atlas. "Glossary." *MPAtlas*, <https://mpatlas.org/glossary>.
12. Marine Protected Areas NOAA. "About MPAs." *National Oceanic and Atmospheric Administration*, <https://marineprotectedareas.noaa.gov/aboutmpas/>.



13. Marine Stewardship Council. "Marine Biodiversity." *Marine Stewardship Council*, <https://www.msc.org/en-au/what-we-are-doing/oceans-at-risk/marine-biodiversity>.
14. Marine Stewardship Council. "Overfishing." *Marine Stewardship Council*, <https://www.msc.org/what-we-are-doing/oceans-at-risk/overfishing>.
15. National Geographic Society. "Marine Reserve." *National Geographic Education*, <https://education.nationalgeographic.org/resource/marine-reserve/>.
16. National Oceanic and Atmospheric Administration. "Fishing Regulations and Seasonal Closures in the Gulf of America." *NOAA Fisheries*, <https://www.fisheries.noaa.gov/southeast/rules-regulations/fishing-regulations-and-seasonal-closures-gulf-america>.
17. National Oceanic and Atmospheric Administration. "Gulf of Mexico Dead Zone Larger Than Average, Scientists Find." *NOAA News Release*, <https://www.noaa.gov/news-release/gulf-of-mexico-dead-zone-larger-than-average-scientists-find>.
18. National Oceanic and Atmospheric Administration. "Magnuson-Stevens Act." *NOAA Laws & Policies*, <https://www.fisheries.noaa.gov/topic/laws-policies>.
19. National Ocean Service. "How Much Water Is in the Ocean?" *National Oceanic and Atmospheric Administration*, 16 June 2024, <https://oceanservice.noaa.gov/facts/oceanwater.html>.
20. National Ocean Service. "What Is Ocean Acidification?" *National Oceanic and Atmospheric Administration*, <https://oceanservice.noaa.gov/facts/acidification.html>.
21. National Ocean Service. "What Is Coral Bleaching?" *National Oceanic and Atmospheric Administration*, https://oceanservice.noaa.gov/facts/coral_bleach.html.
22. National Ocean Service. "What Are Marine Protected Areas?" *NOAA Ocean Explorer*, <https://oceanexplorer.noaa.gov/facts/mpas.html>.
23. Ocean & Climate Platform. "The Decline of Marine Biodiversity." *Ocean & Climate Platform*, <https://ocean-climate.org/en/awareness/the-decline-of-marine-biodiversity/>.



24. Pew Charitable Trusts. "Inside the New High Seas Treaty." *Pew Research and Analysis*, <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2024/08/inside-the-new-high-seas-treaty>.
25. PlasticsEurope. "Global Plastics Treaty." *PlasticsEurope*, 2025, <https://plasticseurope.org/changingplasticsforgood/global-plastics-treaty/>.
26. Schuur, Edward A. G., et al. "Climate Change and the Permafrost Carbon Feedback." *Earth System Science Data*, vol. 7, no. 1, 2015, pp. 349-398. Copernicus Publications, <https://essd.copernicus.org/articles/7/349/2015/>.
27. Secretariat of the Convention on Biological Diversity. *The Convention on Biological Diversity*, <https://www.cbd.int/convention>.
28. United Nations Department of Economic and Social Affairs. "Win for the Ocean: High Seas Treaty Signed at the United Nations." *UN News*, https://oceans-and-fisheries.ec.europa.eu/news/win-ocean-high-seas-treaty-signed-united-nations-2023-09-20_en.
29. United Nations Environment Programme (UNEP). First Global Integrated Marine Assessment: World Ocean Assessment I. *UNEP*, <https://www.unep.org/resources/report/first-global-integrated-marine-assessment-world-ocean-assessment-i>.
30. United Nations. "Marine Biodiversity and Ecosystems Underpin a Healthy Planet and Social Well-Being." *United Nations Chronicle*, <https://www.un.org/en/chronicle/article/marine-biodiversity-and-ecosystems-underpin-healthy-planet-and-social-well-being>.
31. United Nations. *Sustainable Development Goal 14: Life Below Water*. <https://sdgs.un.org/goals/goal14>.
32. United Nations. *United Nations Convention on the Law of the Sea (UNCLOS)*, 1982, https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf.
33. United States Department of Climate Change, Energy, the Environment, and Water. "Protecting the Great Barrier Reef." *Australian Government*, <https://www.dcceew.gov.au/parks-heritage/great-barrier-reef/protecting>.



34. United States Environmental Protection Agency. "Sources and Solutions: Agriculture."
EPA Nutrient Pollution,
<https://www.epa.gov/nutrientpollution/sources-and-solutions-agriculture>.
35. World Council on Ocean Governance. Global Ocean Governance and Ecological
Civilization: Establishing China's Sustainable Fisheries Policy. *China Council for
International Cooperation on Environment and Development*,
[https://cciced.eco/wp-content/uploads/2021/09/Global-Ocean-Governnance-and-Ecologic
al-Civilization-Establishing-Chinas-Sustainable-Fisheries-Policy.pdf](https://cciced.eco/wp-content/uploads/2021/09/Global-Ocean-Governnance-and-Ecologic-al-Civilization-Establishing-Chinas-Sustainable-Fisheries-Policy.pdf).