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Marine Environmental Protection Under UNCLOS And Beyond: Analyzing Legal Gaps, Enforcement Challenges, And Emerging Global Frameworks

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ABSTRACT
The "United Nations Convention on the Law of the Sea" (UNCLOS) is a key legal framework governing maritime rights, with profound implications for environmental protection and sustainable management of marine resources. Established to address diverse oceanic issues, UNCLOS sets guidelines on territorial seas, exclusive economic zones, and navigation rights, while also enforcing regulations on pollution and resource exploitation. A cornerstone of environmental law, UNCLOS facilitates international cooperation, with the "International Maritime Organization" (IMO) and the "UN Environment Programme" (UNEP) playing essential roles in developing supplementary frameworks for pollution prevention and resource conservation. Additionally, the "Biodiversity Beyond National Jurisdiction" (BBNJ) treaty enhances marine biodiversity protection on the high seas, aligning with UNCLOS to promote ecosystem health. Challenges persist in areas such as flag state oversight, land-based pollution, and dispute resolution, yet UNCLOS's adaptability enables diverse nations to balance economic, environmental, and security concerns. Through ongoing collaboration, nations are working toward a sustainable maritime future, addressing both established and emerging environmental threats.

Keywords: UNCLOS, marine environment, pollution, biodiversity, international Law.

INTRODUCTION

The Law of the Sea, a crucial area of international legal principles, ensures order on the oceans and governs a wide range of maritime concerns. Formalized on December 10, 1982, under the "United Nations Convention on the Law of the Sea" (UNCLOS), this "constitution for the oceans" sets down comprehensive legal standards for areas like coastal boundaries, navigational freedoms, and oceanic resource management. The treaty reached international enforceability in 1994 after ratification by 60 countries, and by the early 2000s, over 150 nations had embraced its provisions.

One of the central aspects of UNCLOS is the regulation of a nation's territorial sea, which spans up to 12 nautical miles (about 22 kilometres) from its coastline. Within this zone, foreign vessels have the privilege of "innocent passage," allowing them to traverse sovereign waters provided they abstain from prohibited actions such as military operations, intelligence gathering, unauthorized fishing, pollution, smuggling, and scientific surveys. Passage is considered "innocent" as long as these restrictions are respected. Additionally, in straits critical for global shipping—such as the Strait of Gibraltar, the Bab-el-Mandeb, the Strait of Hormuz, and the Strait of Malacca—UNCLOS establishes a more permissive framework, known as "transit passage," which grants foreign vessels a relatively unrestricted right of passage. Similarly, in archipelagic waters of states like Indonesia, a comparable transit system applies, ensuring that the vital flow of international shipping remains uninterrupted.

A nation that controls coastal areas can establish an Exclusive Economic Zone that reaches 200 nautical miles extending to 370 kilometres beyond their coasts. The "Exclusive Economic Zone"(EEZ) established by a coastal state confers upon it the authority to control scientific investigation while allowing facility and man-made island construction and natural resource administration and exploitation. Coastal nations hold sovereignty over their EEZ resources but fishing and aircraft activities in those zones stay freewheeling for international actors. The assigned provisions create a balance between safeguarding coastal state economic interests while maintaining certain navigational rights available to international entities.

The continental shelf structure receives protection from UNCLOS because it extends from the EEZ as an exclusive national seaboard where coastal states can possess valuable minerals including oil and gas. Every coastal country has exclusive control rights for offshore resources extending from 200 nautical miles and reaching continental margin boundaries or surpassing these boundaries respectively. The convention establishes two defined boundaries either as 350 nautical miles (about 650 kilometers) beyond the coast or as 100 nautical miles (185 kilometers) beyond the 2,500-meter isobath which represents an equal ocean depth. This legally defined "continental shelf" extends beyond the geological meaning, ensuring nations can benefit from offshore resources. When neighbouring states have overlapping territorial seas, EEZs, or continental shelves, they are encouraged to reach an equitable boundary agreement. Such agreements are frequently negotiated; however, when consensus cannot be achieved, international bodies such as the International Court of Justice (ICJ) or arbitration tribunals, as demonstrated in cases like the maritime disputes between Bahrain and Qatar or France and the United Kingdom, intervene to draw fair boundaries. Typically, an equidistant line is used, though adjustments are often made to consider unique geographical or economic factors.

Beyond these national claims, UNCLOS establishes that the high seas are open to all nations. This area—beyond any national jurisdiction—is available for lawful activities, with certain restrictions, such as prohibitions on nuclear testing. UNCLOS also created an international regulatory framework to govern "the Area," a term used for the ocean floor beyond national boundaries. This framework designates mineral resources in this region as the "common heritage of mankind," and mandates that the "International Seabed Authority" (ISA), an organization established by the convention, regulate all exploration and potential mining activities in the Area. Due to initial opposition from some industrialized nations over extensive regulations, the treaty was amended in 1994, introducing modifications that made it more favorable to private-sector and state-led exploration. While commercial extraction has yet to begin, the ISA has laid the groundwork for such activities by establishing licensing protocols and planning a global mining enterprise that would operate alongside private and state ventures. When mining does commence, the ISA's revenues from licensing, fees, and royalties would support global development, with particular attention to assisting developing countries. To this end, private corporations are encouraged to transfer mining expertise and technology to the international community.

While UNCLOS sets detailed regulations on matters like the rights of innocent passage and the definition of a nation's continental shelf, it leaves broader principles on issues like maritime safety, pollution prevention, and resource conservation to be developed through other agreements. The "International Maritime Organization" (IMO), a specialized UN agency, has established specific treaties that govern ship safety, pollution control, and crew qualifications, significantly enhancing UNCLOS's provisions on shipping safety. The IMO has also enacted stringent rules to combat marine pollution. Complementing these efforts, regional treaties, developed largely through the UN Environment Programme, govern pollution from multiple sources, promoting cleaner seas. For fisheries conservation, the *"UN Food and Agriculture Organization's (FAO) Code of Conduct for Responsible Fisheries (1995)"* supports UNCLOS by providing nonbinding guidelines for sustainable fishing within EEZs, where most fishing occurs. Additionally, the UN Fish Stocks Treaty (1995) oversees the management of fish populations that migrate between high seas and national waters, with numerous regional fisheries organizations implementing specific measures for these zones.

Disputes arising from UNCLOS's provisions are, in most cases, resolved through negotiation or other mutually acceptable means, such as arbitration. Should these methods fail, parties may, within certain limitations, bring the matter before the "UN International Tribunal for the Law of the Sea" in Hamburg, the ICJ, or an arbitration tribunal for mandatory resolution. However, there are notable limitations on the mandatory dispute-resolution processes, making diplomacy and negotiation the preferred means for addressing disagreements under UNCLOS.

The Law of the Sea constitutes a vital framework of international public law, governing the geographical reach of coastal nations and setting the standards for the sustainable use of marine environments and resources. UNCLOS, which came into effect in 1994, embodies both established customs and new rules of maritime governance. Today, a majority of the world's nations have ratified the convention, though a few notable states—such as the United States, Canada, Turkey, Israel, and Venezuela—have abstained. Beyond its direct provisions, UNCLOS serves as a foundation for further international agreements and practices, expanding the scope of maritime law over time.

The Law of the Sea operates independently of, but often in coordination with, two other legal frameworks: maritime law and admiralty law. Maritime law, sometimes called admiralty law, pertains to the private legal structure governing vessels and commerce on the oceans. Admiralty law is more specialized, covering jurisdictional issues over shipping, both inland and at sea, and often falls under the purview of dedicated admiralty courts. There are intersections between public international law and these private maritime laws, particularly in regulating vessels within national waters and enforcing domestic laws in the marine domain.

Historically, the foundation of maritime law is sometimes linked to the 1493 Papal Bull, which divided global seas between Portugal and Spain, granting Spain rights over the newly discovered Americas. In the early 17th century, Dutch jurist Hugo Grotius promoted freedom of the seas based on natural law, while English scholar John Selden countered by asserting sovereign rights over maritime zones. Despite advances in technology and science reducing the areas of open seas and the rise of new regulatory mechanisms, these contrasting principles continue to shape modern maritime governance.

OCEANS AND THE LAW OF THE SEA

All life on Earth began in the oceans. The water covers a vast amount of land, around 72% of the planet's surface, or 140 million square miles. Throughout recorded history, the ocean has served as a major conduit for trade, commerce, adventure, and discovery in addition to providing nutrition for the life it has nurtured. People are divided and unified by it. Although continents have been well surveyed and their innards are accessible by road, river, and air, the majority of the world's population lives within 200 miles of the sea and has a strong connection with it.

Freedom of the Seas

Historically the waters followed the freedom of the seas principle that defined national maritime authority as restricted to narrow coastal areas. All water spaces beyond the designated maritime zones belonged to public domain thus excluding any right to ownership from anyone. For the entire 1900s period the worldwide waters remained governed by the freedom of the seas principle. During the middle of the century the world began to advocate for enhanced national rule over offshore resources. Many people started expressing concerns about how distant fishing vessels depleted coastal fish resources together with maritime shipping pollution causing environmental dangers to the sea. Resorts located by the shoreline with all marine life continue to experience threats from pollutants. Maritime nations sent their warships to compete both above water and below the surface for dominance of the international seas.

"United Nations Law of the Sea Convention" (UNCLOS)

The United Nations has worked tirelessly to promote the peaceful, cooperative, and regulated use of the world's oceans and seas, aiming to create benefits for all of humanity. After fifteen years of unwavering efforts to establish a comprehensive international framework for governing the ocean floor and seabed areas beyond national boundaries, significant agreements were achieved. These include a treaty prohibiting nuclear arms on the ocean floor, a General Assembly declaration affirming that resources located on the seabed outside national jurisdictions are the shared inheritance of all humankind, and the "Stockholm Conference on the Human Environment." The ratification of the 1982 "United Nations Convention on the Law of the Sea" stands as a milestone in international law, recognizing the immense and communal aquatic resources of our planet and setting forth guidelines for their responsible stewardship.

"The convention has resolved several important issues related to ocean usage and sovereignty, such as:

- *Established freedom-of-navigation rights*
- *Set territorial sea boundaries 12 miles offshore*
- *Set exclusive economic zones up to 200 miles offshore*
- *Set rules for extending continental shelf rights up to 350 miles offshore*
- *Created the International Seabed Authority*
- *Created other conflict-resolution mechanisms (e.g., the UN Commission on the Limits of the Continental Shelf)."*

A Historic New Maritime Biodiversity Treaty to Protect the Marine Environment

Countries are responsible for the protection and sustainable use of rivers within their territorial sovereignty. The high seas, however, are now better protected against harmful activities like pollution and unsustainable fishing operations, even if they are not under the jurisdiction of the states.

The 193 UN member states ratified a landmark, legally enforceable agreement on marine biodiversity on June 19, 2023. The agreement aims to promote collective preservation and sustainability in the high seas, which make up two-thirds of the Earth's oceans, and it follows nearly twenty years of intense negotiations.

The "Biodiversity of Areas Beyond National Jurisdiction" (BBNJ) approved a convention so that it could take responsibility for protecting marine biodiversity in areas beyond of national jurisdiction, both for the present and for generations to come. The "Convention on the Law of the Sea" is in harmony with this accord, which is called the "high seas" pact. Protecting, preserving, and promoting the appropriate use of the marine environment are the goals of the agreement. Protecting marine biodiversity and maintaining healthy ocean ecosystems are its primary goals.

Protection of marine environment and biodiversity

The "United Nations Environment Programme" (UNEP) is working to promote the responsible use of marine resources and ensure the protection of the world's oceans and seas via its Regional Seas Programme in particular. The Regional Seas Conventions and Action Plans represent the primary international legal framework dedicated to preserving seas and oceans at the regional level. To mitigate the impact of land-based activities on marine ecosystems, the UNEP created the Global Strategy, a holistic framework. This strategy is unique in its inclusive approach to ecosystems, taking into account not only land areas but also freshwater, coastal zones, and marine environments.

Additionally, the Intergovernmental Oceanographic Commission, part of UNESCO "United Nations Educational, Scientific, and Cultural Organization", oversees initiatives in marine research, ocean monitoring, disaster risk reduction, and the improved governance of coastal and oceanic ecosystems.

The Ocean Decade, officially known as the "UN Decade of Ocean Science for Sustainable Development (2021–2030)", was declared by the United Nations General Assembly in 2017. Enhancing the state of the ocean system and supporting sustainable development of this enormous marine environment are the goals of this decade's ocean scientific and knowledge acquisition efforts.

The goal of the Ocean Decade is to achieve "the science necessary for the ocean we desire." In order to speed up progress in ocean research, the initiative creates a platform where scientists and stakeholders from different industries can connect, learn from one another, and work together more effectively. To better understand the ocean system and provide solutions that are based on science, these projects may be a great help in achieving the goals of the 2030 Agenda. The role of coordinating the planning and implementation of the decade was allocated by the UN General Assembly to "UNESCO's Intergovernmental Oceanographic Commission" (IOC).

When it comes to creating rules for the global seas, the primary UN body in charge is the "International Maritime Organisation" (IMO). Creating a legal framework for the marine industry that is fair, efficient, well-known, and enforced is the main goal.

Marine shipping and pollution

To promote cleaner and more sustainable shipping, the IMO has implemented restrictions targeting air pollutant emissions from vessels and has established enforceable energy-efficiency requirements to mitigate greenhouse gas emissions from international shipping. These comprise the pivotal "International Convention for the Prevention of Pollution from Ships" of 1973, amended by the 1978 Protocol (MARPOL), and the "International Convention for the Prevention of Pollution of the Sea by Oil 1954".

Polar Code

In 2017, the worldwide standard known as the arctic Code was put into force for ships that operate in arctic seas. Design, equipment, construction, operations, environmental protection, training, search and rescue, and more are all addressed in the Polar Code, which is essential for ships operating in the hostile polar waters. It was a huge improvement over the transportation and trade facilitation rules that had gone through a lot of revisions due to things like supply chain security, environmental concerns, and the maritime sector.

Piracy

Pirate attacks in the Gulf of Guinea and around the coast of Somalia have increased in frequency and severity throughout the last few years. Attacks by pirates put at risk not only the security of commerce and navigation but also the lives of sailors. Shipowners may lose money, customers and producers may pay more, the maritime ecosystem may suffer harm, and sailors run the danger of physical violence or hostage-taking as a consequence of these illegal activities.Pirate assaults may hinder humanitarian aid and increase the cost of future supplies to affected areas, potentially leading to far-reaching consequences. Aside from the regulations outlined in the Law of the Sea Convention, the "United Nations and the International Maritime Organization" have also passed resolutions to address piracy.

With a primary emphasis on the Horn of Africa and the Gulf of Guinea, the "UNODC's Global Maritime Crime Program" (GMCP) fights transnational organized crime in Africa. Supporting regional nations and strengthening maritime law enforcement capacities, the project has facilitated training programs and prosecuted pirate offenders. Despite facing difficult circumstances, the UNODC GMCP has achieved impressive results, including creating a model for pirate prosecution, transferring prisoners, preparing members to serve in maritime courts in the Indian and Atlantic oceans, and offering round-the-clock mentoring to coast guards and police units in Somalia, Kenya, and Ghana. This was made possible by a number of initiatives that strengthened the legal systems and increased marine safety.

THE "LAW OF THE SEA CONVENTION" (LOSC) AND THE ENVIRONMENT

The United States and other countries set a historic precedent with the LOSC, the first ever comprehensive global agreement for marine environment preservation, thanks to their leadership. When it comes to management and policy, the LOSC is all for evidence-based approaches that improve collaboration across military, environmental, and economic concerns.

The agreement upholds the right of any state to use its own natural resources, so long as such uses don't harm the environment. Since they connect the shores of every country, the oceans have taken on scientific, diplomatic, and economic importance like never before. By carrying out their duties within the framework of the Convention and making use of its enforcement mechanisms and anti-pollution measures, nations are encouraged to safeguard marine environments. The restrictions detailed in this study do not apply to warships or other vessels having sovereign immunity, as stated in Article 236 of the LOSC.

Economists have determined the oceans' worth in ways that show how important they are to everyone. The oceans were valued at $24 trillion by the World Wildlife Fund (WWF) in 2015. When marine ecosystems, deep-sea industries, endangered species, and public waterways are protected and preserved, everyone benefits. Oil spills from ships like the Exxon Valdez in 1989, which contaminated 1,300 square miles off the coast of Alaska, show how widespread modern environmental disasters are and the dangers they pose to marine ecosystems.

Due to events such as the Fukushima nuclear disaster, red tides, oil spills, and plastic gyres, the oceans are no longer believed to have the capacity to absorb human waste indefinitely. The LOSC was innovative for its time because it used regional cooperation and pollution management to protect the seas' economic and environmental resources from widespread catastrophes.

Aside from its economic implications, the LOSC is significant because the marine ecosystem supports life on Earth. The State Department asserts that marine biodiversity and ecosystems are crucial for the operation of the Earth's surface and atmosphere, which support living organisms and, consequently, human well-being. We must preserve rather than harm the environment to safeguard our livelihoods. Nature is not inherently capable of self-replenishment. Human activity in the Pacific Ocean has irreversibly damaged coral reefs, which provide vital habitats for several undersea organisms. China's excavation of coral reefs for the construction of artificial islands has led to a 50% decline in these ecosystems. 3 As global populations increase, environmental pressures will intensify. International environmental collaboration and governance can mitigate the effects on the marine ecosystem through enhanced accountability and enforcement.

ENVIRONMENTAL FRAMEWORK

International Collaboration in Marine Environmental Protection

Within a global framework that emphasizes both regional and worldwide cooperation, Part VII of the United Nations Convention on the Law of the Sea (LOSC) has established foundational guidelines aimed at protecting the marine environment, while respecting the autonomy of individual nations. However, the LOSC intentionally allows flexibility, refraining from strictly prescribing the duties of states or specific enforcement mechanisms. This approach enables various forms of implementation by providing space for diverse interpretations.

The LOSC facilitates international cooperation in marine conservation through recognized international organizations or direct collaboration between states. Part VII articulates several key obligations that define this framework. These include: 1) preserving and safeguarding marine ecosystems, 2) controlling and reducing pollution in marine environments regardless of its origin, 3) preventing the introduction of invasive species into marine ecosystems, and 4) ensuring pollution generated within a state's jurisdiction does not extend beyond the area over which it exercises sovereign rights.

Facilitating Inter-State Communication

The LOSC also encourages open communication among states as a preventive measure against environmental damage and to minimize the risk of contamination. This policy of shared information allows states to exchange valuable data and insights about the marine environment, supporting a mutually beneficial process that is both diplomatic and scientifically advantageous. Such collaboration fosters not only a unified response to environmental threats but also reinforces accountability among nations, potentially reducing costs by sharing resources and knowledge.The LOSC further prioritizes financial and technical support for developing nations, facilitating their active involvement in this global initiative. By contributing to these processes, each participating nation can document and share regular scientific updates on their marine ecosystems, leading to better-informed strategies to combat pollution. Consistent with the LOSC's guidelines, any new regulations, standards, or agreements formed between states or within international organizations should be rooted in scientific research, ensuring that responses to environmental issues are evidence-based.

Responsibilities of States under the LOSC

The LOSC is committed to upholding the principle of non-interference with state sovereignty. It requires that states assess not only the environmental impact of their own activities but also how these actions might affect other nations. Rather than enforcing a universal regulatory structure, the LOSC acknowledges that pollution control policies may need to be tailored to the specific conditions of each region.

To support these efforts, states are encouraged to consider internationally accepted standards and best practices when developing their own pollution control measures. This allows nations to work collectively toward reducing marine pollution, while still accommodating the unique environmental and economic characteristics of each region. Whether pollution originates from shore-based activities or from seabed operations, the LOSC mandates that national regulations be equally rigorous as those established by international bodies.

The responsibility for law enforcement is largely decentralized, falling on the individual states. In instances where disagreements arise over environmental or territorial claims, these conflicts may lead to disputes, which are often resolved by courts that seek fair outcomes despite the lack of concrete enforcement measures for private entities and states alike. Through this flexible structure, the LOSC aims to provide a holistic approach to understanding the marine environment and inter-state relationships in environmental protection.

Case Study: A pertinent example of the LOSC's application in environmental matters is the South China Sea (SCS) Tribunal's ruling, which found that China had violated certain environmental provisions within the LOSC. The Tribunal identified infractions stemming from fishing practices and island-building activities that conflicted with LOSC requirements for marine conservation. However, there remains debate among experts regarding the specific remedies and enforcement measures that can be invoked under the LOSC or customary international law by other coastal nations or foreign fishers affected by these environmental breaches. For an in-depth examination of the Tribunal's findings, further reference can be made to Chapter 10.

Different Categories of Marine Pollution

The LOSC identifies six major categories of marine pollution: (1) land-based or coastal activities, (2) drilling on the continental shelf, (3) seabed mining, (4) waste disposal into the ocean, (5) pollution from vessels, and (6) air pollution. Notably, the "National Oceanic and Atmospheric Administration" (NOAA) has reported that over 80% of marine pollution originates from land-based sources.

In the mid-20th century, waste disposal practices from land-based industries often involved ocean dumping, leading to widespread pollution. The 1996 Protocol to the London Convention redefined marine pollution to encompass contamination caused by vessels, aircraft, platforms, and other human-made structures. Although the LOSC encourages proactive measures from individual states, it does not enforce a global regulatory framework for pollution arising from land-based activities. The absence of this provision could result in specific areas becoming disproportionately affected by pollution. Therefore, more research is needed on pollution management strategies, including collaborative frameworks to enforce compliance and address pollution originating from terrestrial sources.

Vessel-Source Pollution

Pollution from ships, also known as vessel-source pollution, occurs when harmful substances such as oil or other residues are discharged into the sea. While regular operations from ships contribute more oil to the ocean than catastrophic tanker spills, highly publicized incidents like the Exxon Valdez spill have nonetheless spurred international efforts to address maritime pollution. Under the LOSC and the "MARPOL International Convention for the Prevention of Pollution from Ships", regulations were established to address pollution from ships, emphasizing the need for consistent and comprehensive oversight.

MARPOL, which stands for Marine Pollution, is a pivotal international agreement that seeks to prevent pollution from both operational discharges and accidental spills from ships. Together, the LOSC and MARPOL provide a foundational framework for the regulation of vessel-based pollution, aiming to mitigate the impact of harmful substances released into the ocean. While enforcement remains primarily within the jurisdiction of individual states, the cooperation fostered under these conventions underscores the international community's commitment to preserving marine environments from vessel-source pollution.

Moving Forward: A Call for Enhanced International Collaboration

As the LOSC underscores, environmental stewardship of the oceans is a shared responsibility that requires coordinated action at both regional and global levels. Despite the flexibility afforded to states in how they implement these guidelines, a

collaborative approach remains essential for achieving meaningful reductions in marine pollution. Strengthening inter-state communication and bolstering support for developing nations are critical steps toward creating an equitable and effective framework for marine conservation.Future efforts may benefit from further refining the roles and responsibilities of states and international bodies in environmental protection. Additionally, establishing a unified system for addressing land-based pollution, which accounts for the majority of marine contamination, could significantly enhance global conservation efforts. By aligning national regulations with international standards and fostering a spirit of cooperation, the LOSC framework holds the potential to address current and future environmental challenges in a manner that respects state sovereignty while promoting the health of the world's oceans.

"INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS" (MARPOL)

The MARPOL treaty was set up in 1973 by the worldwide community to deal with oil, dangerous chemicals, packaged dangerous items, sewage, and rubbish that pollutes the ocean. In 1978, the "International Maritime Organisation" (IMO) issued a Protocol imposing regulations on the building and operation of tankers in response to a string of pollution accidents that occurred between 1973 and 1977. These two instruments—the original MARPOL Convention of 1973 and the 1978 Protocol—are collectively known as MARPOL 73/78. Beyond the issue of accidental and operational pollution, MARPOL 73/78 was developed to tackle other sources of pollution from ships. It includes annexes addressing chemical spills, hazardous substances in packaged forms, sewage discharge, and waste disposal. In 1997, a new annex was added to address air pollution caused by ships. Additionally, MARPOL 73/78 includes two protocols, one focused on reporting incidents involving hazardous substances and the other on arbitration procedures. Annexes I and II are mandatory for participating nations, while the remaining annexes are optional and may be adopted by member states at their discretion.

Flag State Jurisdiction

A ship's flag represents its nationality, and by listing a vessel in its registry, a country assumes responsibility for ensuring that the vessel complies with both its own regulations and relevant international standards. These obligations are what define a country as a "flag State." For example, MARPOL's first two annexes reflect widely accepted global standards that most countries have adopted. According to the "United Nations Convention on the Law of the Sea" (UNCLOS), the penalties that a flag State imposes for violations should be strict enough to discourage violations wherever the ship might be operating.

Flag State Authority and Obligations

Flag States create and enforce laws based on international guidelines. An example is the CDEM standards, which address ship construction, design, equipment, manning, and operation to ensure safety and prevent pollution. Flag States are also responsible for enforcing these laws. They may require vessels to meet "seaworthy" conditions before setting sail, carry necessary certifications, and undergo routine inspections. When a vessel under their jurisdiction violates regulations, the flag State has a duty to investigate promptly, take corrective actions, and inform the IMO and any concerned States about these measures.

Importantly, a flag State's regulatory authority follows its ships worldwide. However, many flag States are not prominent maritime nations and often have tax benefits or looser regulatory requirements that make them attractive to ship owners. This approach, while advantageous for attracting business, often results in limited oversight capacity and minimal enforcement, leading to the problem known as "flags of convenience." As a result, less responsible ship owners sometimes register their vessels in these lenient jurisdictions to avoid stringent regulation. This issue has prompted other jurisdictions, particularly coastal and port States, to assume additional authority to legislate and enforce marine environmental standards.

Case Study: The Liberian Registry exemplifies the practice of "flags of convenience." Ships register under foreign flags as proof of ownership and to gain access to international waters. Ship owners registering with Liberia benefit from fewer inspections and lighter regulations, which can reduce costs and allow greater anonymity. There are almost 4,000 ships in the Liberian Registry, with a combined gross tonnage of over 133 million, making it the second biggest registry in the world. This accounts for around 11% of the world's entire oceangoing fleet.

ENVIRONMENTAL LAWS AND MARITIME SECURITY

However, interests in environmental security may sometimes pose conflict with national security interests; it at the same time provides room for cooperation. Conservation of natural resources and security meet their purpose in maritime areas through fundamental responsibilities of bringing success and stability in the U.S. and global realms. Thus, through enacting its laws it is possible for many countries including the U.S. to protect marine ecosystems like through the formation of the marine protected areas. Some anticipate that these regulations may actually infringe on the free movement in the areas which are declared special regulated zones. At the same time, the U.S. has successfully utilized such protections to regulate the activities of foreign fishing around some coastlines, including the New England, in order to prevent over fishing by foreign parties. Some of these environmental policies can reverse the allocations of rights and duties provided under the LOSC, between the flag, coastal and port states. However, LOSC grants room for regional solicitous within a cooperative architecture.

The "Marine Mammal Protection Act" (MMPA) is a classic example of how the forces of conservation and security concerns fit in a relationship. Adopted by the Congress to protect marine mammals from depletion, the MMPA has the primary goal of ensuring that those species do not get to the brink. Thus, one recent case from the 9th Circuit Court of Appeals is NRDC v., Pritzker, shows that his can complicate things a bit when one tries to bring together various interests in maritime business. This case was filed by the "Natural Resources Defense Council" (NRDC) against the "National Marine Fisheries Service"

(NMFS) regarding its regulation of low-frequency sonar used by the military to interfere with activities such as migration, breeding, feeding and others among the marine mammals. The present use of sonars was deemed by the NRDC as unlawful under the MMPA given its negative impact on marine mammals The Navy on its part claimed that additional checks and balances could prove disadvantageous to sonar operations of strategic value in national security.

The 9th Circuit Court sided with the NRDC, ruling that the NMFS had not adequately fulfilled its legal obligation to ensure that sonar activities had the least possible adverse impact on marine mammals. The court clarified that the MMPA's restrictions apply only to peacetime operations, emphasizing that its decision does not restrict Navy actions in times of war or during active military operations. This case underscores the challenge of aligning the interests of various stakeholders in marine resource use, particularly when national security and environmental protection intersect.

Oceans are not only economically valuable and scientifically significant, but they also hold cultural and emotional importance for people worldwide. The LOSC offers a baseline for global marine environmental protection, encouraging states to take responsibility for their environmental impact and to collaborate in addressing pollution. By prioritizing the health of marine ecosystems, the LOSC serves as a cornerstone of international environmental governance, safeguarding the balance of the world's oceans and protecting crucial food sources for over a billion people.

CONCLUSION

UNCLOS has set the rule- rather extensive legal framework for all the oceans of the world in setting measures of national interests along with global earth concern. UNCLOS delimits territorial sea, assigns exclusive economic zones and asserts rights over continental shelves and offers coastal states control over sea resources, while preserving most important freedoms of international community, including navigation and over flight.

UNCLOS is most relevant when it comes to environmental protection and control of pollution. By its guidelines and structures, it has empowered the "International Maritime Organisation" (IMO), "United Nations Environment Programme" (UNEP) and numerous other international agencies to set policies and conventions here and address questions like marine pollution/ degradation or ecosystem exhaustion. Further, the treaty of "Biodiversity Beyond National Jurisdiction" (BBNJ) provides the supplementary protection of UNCLOS's environmental purpose this time for the preservation of the biological resources in the international waters for the future generation.

However, there remain issues with UNCLOS. Such problems as flag-state performance, in which certain countries may fail to exercise sufficient control over the ships flying their flags, remain challenges to the marine environment. In addition, the convention has relatively weak means of regulating pollution from land sources, which are responsible for the largest share of marine pollution. These concerns coupled with what may be a little more related issue of increased complexity in the process of handling and resolving dispute consequent to environmental breaches underscore the need of enhanced effective legal instruments.

Nonetheless, UNCLOS continues to acts as an important platform for promoting cooperation in the management of the world's oceans. However, as local environments continue to become progressively harder globally, it will remain critical to augment and elaborate on UNCLOS principles. Sustainable corporation and improvement of the cooperation frameworks are possible due to UNCLOS to reach better conditions of the maritime space. Its relevance today underlines the need for collective approbation on a worldwide basis to protect the ocean—an essential asset for humanity and other species.

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