



Marine protected areas in Colombia: A historical review of legal marine protection since the late 1960 s to 2023

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ABSTRACT

This study examines Colombia's legal framework for marine conservation, focusing on its historical developments and progress toward international conservation goals. It analyzes Colombia's unique approach to creating protected areas, beginning with land-based conservation in the late 1960 s and later expanding to coastal and marine areas to evaluate the current marine protection status. The methodologic framework used a map-based approach using the Marine Conservation Atlas (MPAtlas) and the National Unique Register of Protected Areas (RUNAP), which provides detailed information, including the level of protection and size of MPAs. The study emphasizes the importance of community involvement in the implementation and management processes of marine protected areas and recommends evaluating existing Marine Protected Areas against new pressures on the ocean and advancing ecosystem-based ocean management. The article highlights Colombia's success in meeting Aichi Target 11, which aimed to protect 10% of the world's oceans by 2020, and the need for more harmonized legal frameworks and improved management of conservation standards across existing MPAs. The study identifies several challenges facing marine conservation policies in Colombia, including the lack of adequate evaluation mechanisms, corruption, internal conflicts, and limited impact of scientific research on policy implementation. Finally, it highlights the need for a simplified classification system based on conservation objectives, natural characteristics, and allowed uses and activities, following the international standardization proposed by the IUCN.

1. Introduction

Coastal areas are widely recognized as some of the most densely populated regions in the world. Over 65% of the global population resides in coastal areas, making marine and coastal biodiversity increasingly vulnerable to anthropogenic pressures such as overfishing, tourism, deep sea mining, and other extractive activities resulting in pollution and ecological harm [22].

Despite governmental and institutional efforts and international guidance, around 66% of the marine environment has undergone anthropogenic modification [28]. Therefore, marine protected areas (MPAs) are crucial mechanisms for preserving marine and coastal biodiversity and the cultural legacy of marine ecosystems. It is recommended that countries establish MPAs within their Exclusive Economic

Zones (EEZs). These zones cover a significant portion of the world's oceans and include areas with high levels of human and industrial activity.

Marine Protected Areas can benefit from nature-based tourism [38]. Some MPAs tends to be recategorized, as in the case of the Cozumel Reefs National Park [2]. Other MPAs present several problems and discrepancies regarding boundary limitations [4]. These modifications must be part of the seas and coasts policy, which promote proper coastal marine management [8,23].

It is important to note that creating MPAs is typically more straightforward and common in national waters, where governments have established legal frameworks for this purpose. Conversely, enforcing marine protection in areas beyond national jurisdiction (ABNJ) is more complex.

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MPAs can be considered as geographically defined areas that aim to ensure the long-term conservation of ecosystems and associated cultural values (Dudley, 2008). The International Union for Conservation of Nature (IUCN) has defined a marine protected area as a legally established region that encompasses intertidal or subtidal land, including the accompanying surface water, flora, and fauna, as well as historical and cultural features [48].

This article utilizes a historical analysis approach to examine Colombia's legal framework for marine protected areas, assessing the country's progress toward achieving international marine conservation goals within the context of International Biodiversity Law [33]. The study uses data sources such as MPAtlas, WDPA/Protected Planet, and the classification of marine protected areas of the Marine Conservation

Institute (MCI) to evaluate the level of implementation of Colombia's marine conservation policy. The importance of marine protected areas in safeguarding the natural environment, biodiversity, and cultural heritage is highlighted throughout the analysis.

The article is divided into two parts: the first provides a theoretical background on marine protection policy and the milestones of international marine protection legal framework, while the second takes an in-depth historical approach to review the legal framework of Colombia's marine protected areas, dividing the analysis into four chronological periods, each representing a significant shift in policy and implementation.

The study offers valuable insight into the origins and historical progression of marine conservation institutions in Colombia providing a

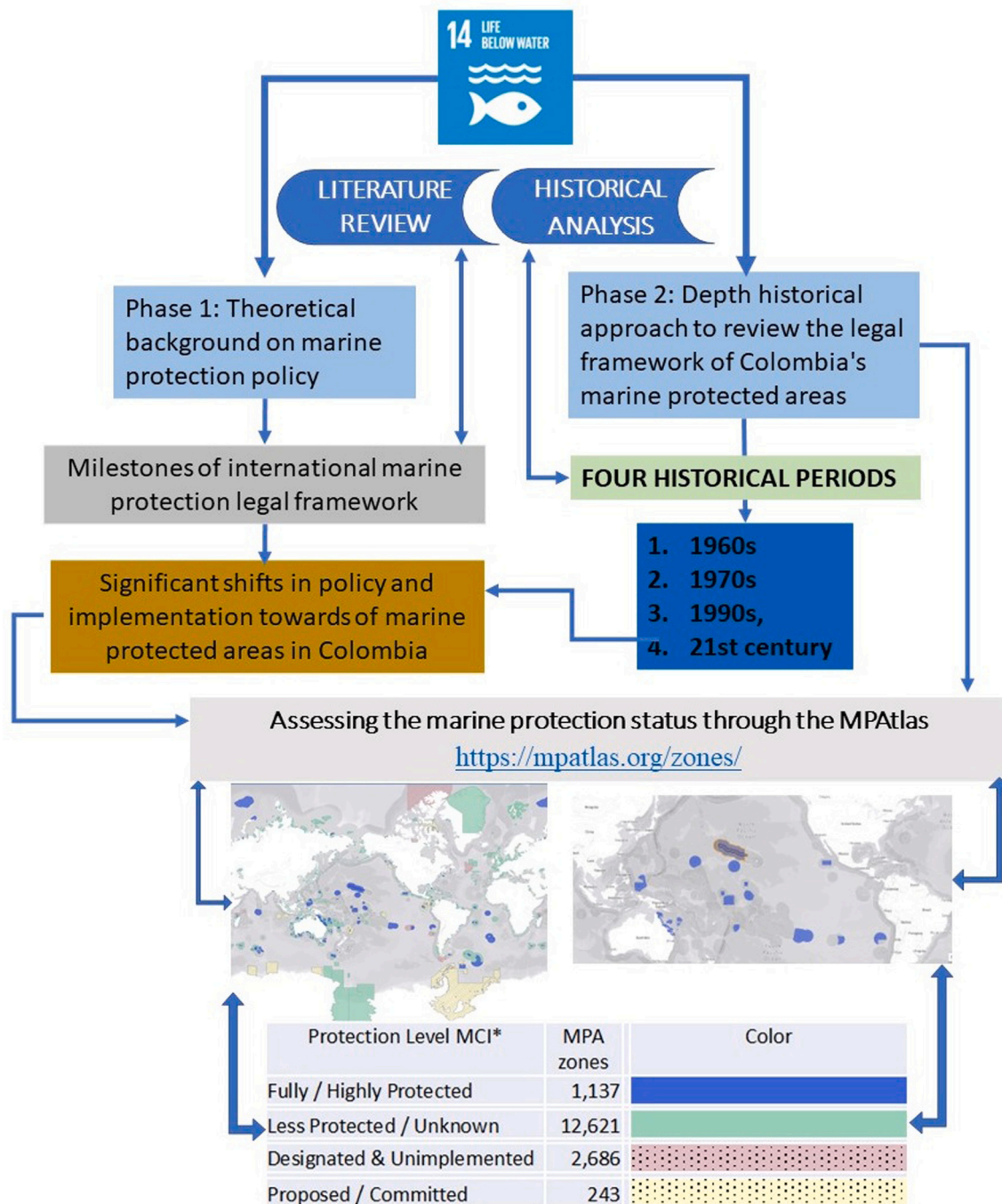


Fig. 1. Methodological scheme of the research.

clear and comprehensive summary of the evolution of the legal regime of marine protected areas in Colombia, contextualized within the international framework, and supported by a robust bibliography and a complete set of geographic maps.

2. Methods and materials

The methodological scheme of this article is represented in Fig. 1. Phase 1 developed the theoretical background of marine protection policy, while in phase 2 an in-depth historical approach to reviewing the legal framework of Colombia's marine protected areas is carried out.

2.1. Legal history

The study of the history of Law enables the examination of legal phenomena in short, medium, and long-term evolutionary processes [5, 20, 37]. Understanding legal history is crucial for the development of national and international regulations related to Marine Protected Areas (MPAs), as historical analysis can provide insights into future regulatory frameworks [19, 34].

With a focus on institutional and policy dimensions related to environmental matters, the study of legal systems and institutions hereby conducted refers mainly to laws and policy documents regarding marine ecosystem protection [6, 29]. In this context, customs and current practices are often considered sources for legal historical analysis [30, 49].

A systematic historiographic approach was used to interpret Colombia's legal framework for marine conservation, considering the consistency of national law with relevant fields of international law. The study identified at least four historic periods that characterized significant advances in the creation of marine and coastal protected areas in Colombia. The first period, in the 1960 s, marked the birth of the idea of protected areas in the country through the creation of National Parks and other protected spaces. The second period, in the 1970 s, saw the emergence of specific environmental legislation in Colombia in response to the country's participation in the 1972 Stockholm Conference.

During the third period, the 1990 s, a consolidated structure of environmental public policy was established, and institutions were transformed from simple administrative departments to systemic structures. Finally, the fourth period, marked by the entry into the 21st century, saw a turning point in structuring environmental public policies. The enactment of the 2011 Organic Law of Territorial Planning established the mechanisms for articulation between governance levels, providing the basis for the creation of Regional Systems of Protected Areas (SIRAP).

The four historic periods identified in the study reflect significant shifts in policy and implementation toward the creation of marine protected areas in Colombia. These shifts were influenced by Colombia's participation in international agreements and the emergence of a consolidated structure of environmental public policy. The study's approach underscores the importance of historical analysis in assessing progress towards meeting international marine conservation goals and can serve as a guide for future legal developments in the field.

2.2. Assessing the marine protection status through the MPAtlas

In Colombia and other places, a gap often exists between the potential of the legal framework and the actual implementation of protected areas ([7, 43]). Thus, this analysis provides a means to compare the legal framework with the current state of protection measures [3, 12, 24].

This article presents a map-based approach to evaluating the current status of legal marine protection in Colombia. In phase 1, a legal analysis is conducted, which is then complemented in phase 2 by mapping MPAs using the Marine Protectio Atlas (www.mpatlas.org). This tool utilizes data from marineregions.org (www.marineregions.org) and the World

Database on Protected Areas (WDPA)/ProtectedPlanet (www.protectedplanet.net/en), which is the official directory of marine and terrestrial protected areas. The MPA data in MPAtlas are associated with corresponding geospatial data in WDPA.

The Marine Conservation Atlas provides a nuanced view of MPAs, including areas not legally designated as protected and tracking committed or proposed protected areas that have not yet received legal or authoritative recognition. The data presented were collected through a web-based map service with interactive views that can be queried through an online access application. The MPA data in this source were updated in May 2022 and represented the most recent regulatory information available.

The maps and data generated in this study provide information on the level of protection and size of MPAs. As illustrated in Fig. 2, Panel B, the MCI evaluation allows for identifying "fully/highly protected areas", where extractive activities are prohibited or severely limited. Sometimes, fully/highly protected areas may also include restrictions on recreational use, as seen in the Nazca-Desventuradas Marine Park in Chile. MCI's atlas also recognizes "less protected areas" that offer some protection but still allow moderate extractive uses. MPAs that are "designated/unimplemented" are legally recognized but not yet implemented, existing only on paper. Additionally, the MCI's assessment includes a "proposed/committed" level when the intention to create the MPA is publicly stated, even informally. MPAs are also categorized based on their size as very large ($\geq 100,000$ km²), large (100–100,000 km²), small (10–100 km²), and very small (< 10 km²), with a total of 10,815 MPAs identified.

2.3. Background

Marine protected areas (MPAs) are defined as coastal and marine regions with precise boundaries, legally restricting fishing, extraction, transportation, and conserving habitats [31]. MPAs are vital for safeguarding marine biodiversity and seabeds [27]. However, the definition and implementation of MPAs often lack clarity, leading to disagreements among stakeholders [1, 10, 42]. Some argue for complete prohibition, while others advocate for multiple uses [51, 52], emphasizing the need for integrated governance and collaboration among coastal communities, authorities, fisheries, and NGOs [35].

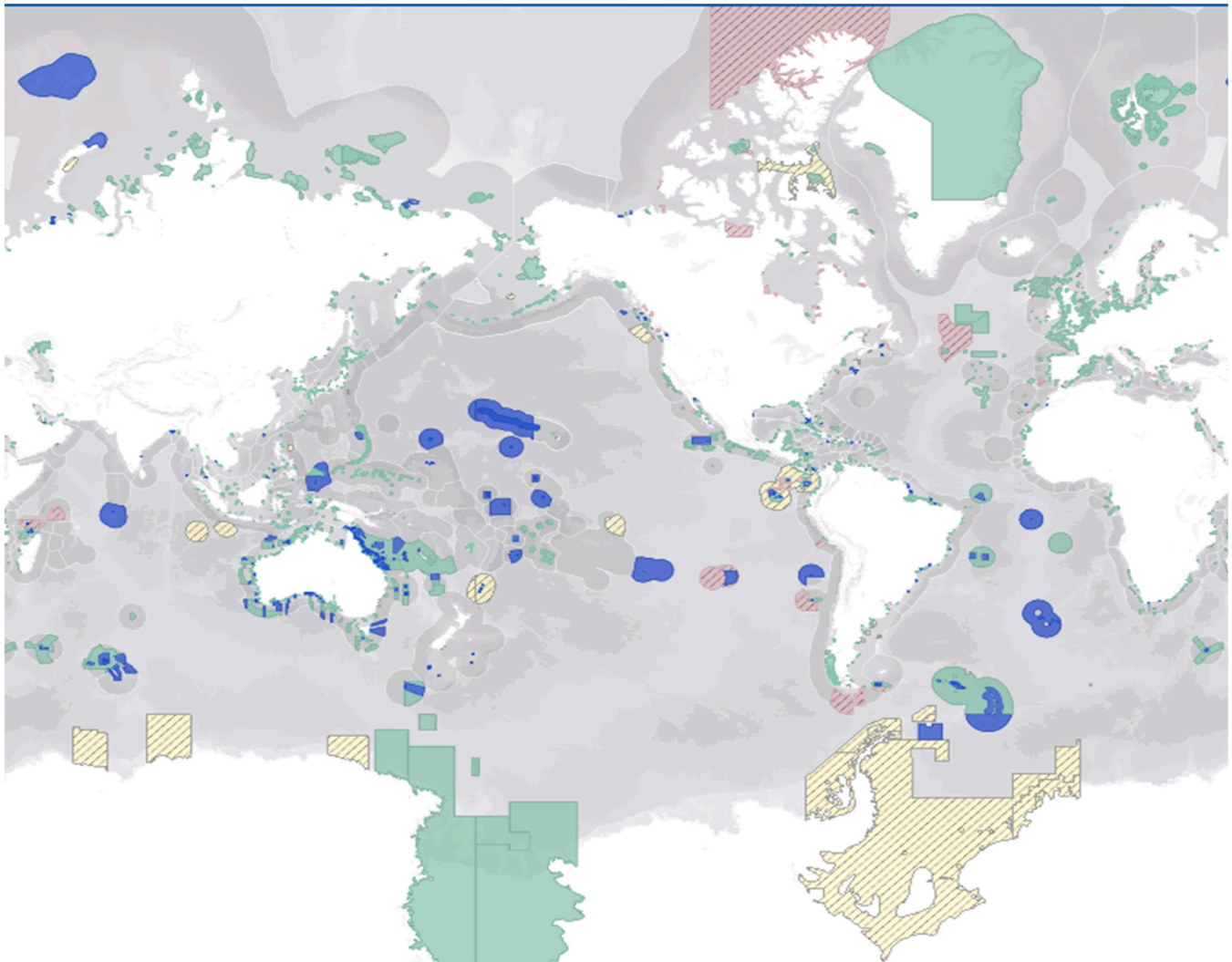
MPAs play a crucial role in protecting both marine ecosystems and the well-being of people. They have been recognized for their positive spillover effects on adjacent areas, contributing to increased marine resources and overall environmental conservation [18, 47]. To ensure the success of an integrated marine protection strategy, it is essential to consider the interconnectivity of ecological, geomorphological, and social systems [36], and to establish integration and collaboration among stakeholders [14, 45].

Adopting adaptive ecosystemic co-management approaches, which acknowledge the invaluable traditional knowledge held by local communities, is key to effective MPA management [9, 13, 15, 16, 40, 44]. Balancing cultural heritage and environmental protection can pose challenges, underscoring the significance of adopting a biocultural approach [9, 26]. Notably, the Papahānaumokuākea marine protected area (Fig. 3) exemplifies this approach by safeguarding biodiversity, preserving Native Hawaiian culture, and being recognized as a UNESCO World Heritage site and Marine National Monument.

2.4. International framework with legally enforceable impacts on Colombian laws and regulations

The Action Plan for the Human Environment [53], produced during the United Nations Conference on the Human Environment in Stockholm in 1972, marked a critical moment in worldwide environmental conservation by calling for the creation of protected areas to safeguard natural resources and ecosystems. Although the plan did not explicitly mention Marine Protected Areas (MPAs), its principles and goals

a. Global MPA overview



b. MCI's protection level classification

Protection Level MCI*	MPA zones	Color
Fully / Highly Protected	1,137	
Less Protected / Unknown	12,621	
Designated & Unimplemented	2,686	
Proposed / Committed	243	

Fig. 2. Global overview and MCI protection level classification

Source: Marine Conservation Institute, 2021, MPAtlas, <https://mpatlas.org/>, last updated 2022-05-17 * Marine Conservation Institute.

provided a basis for developing global agreements and conventions concerning the formation and administration of MPAs [50].

Subsequent international agreements, such as the Ramsar Convention on Wetlands, have emphasized the importance of MPAs for conserving marine biodiversity and ecosystem services. For instance, the Ramsar Convention on Wetlands has specific regulations promoting establishing and managing MPAs within the framework of broader

marine spatial planning and management initiatives to provide diverse ecological services, including coastal protection, nutrient cycling, and fishery resources. The convention also emphasizes the importance of stakeholder engagement and collaboration among different sectors and agencies involved in the management of MPAs [46].

Colombia's legal framework for marine protected areas is strongly influenced by the United Nations General Assembly Resolution 37/7

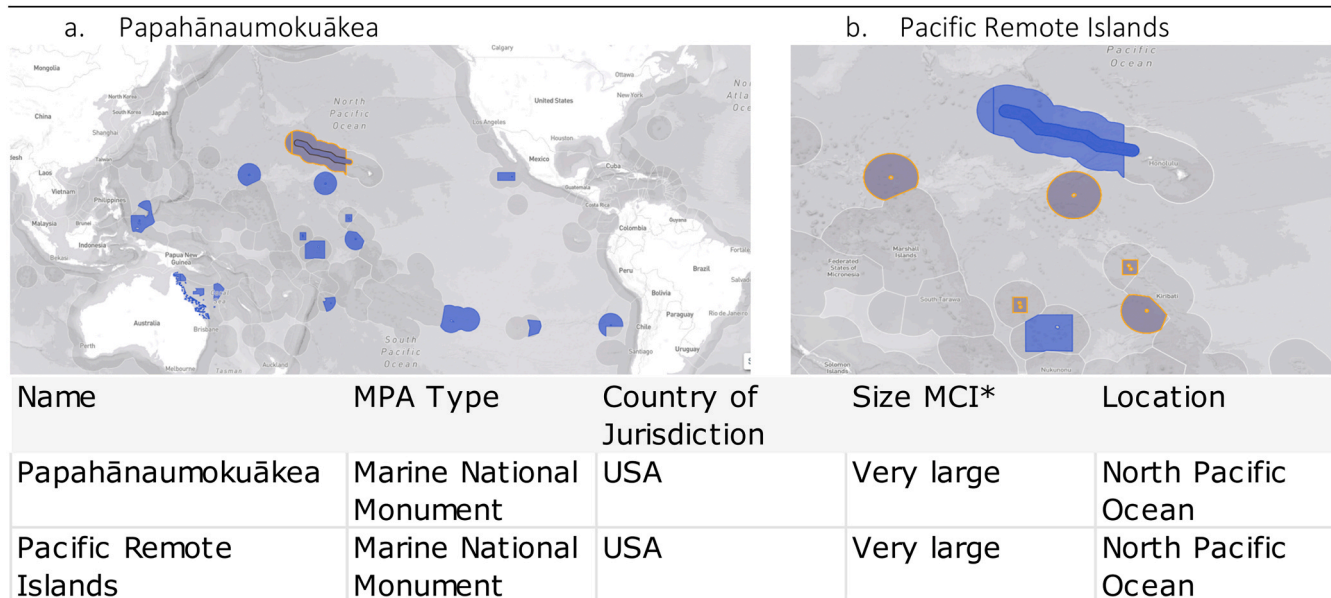


Fig. 3. Largest Fully Protected Areas Worldwide (beyond 1 m km2)
 Source: Marine Conservation Institute, 2021, MPAtlas, <https://mpatlas.org/>, last updated 2022-05-17 * Marine Conservation Institute.

World Charter for Nature adopted in 1982, which includes five conservation principles. One of the principles, Principle 3, highlights the importance of special protection for unique areas, representative ecosystems, and habitats of rare or endangered species. Another principle, Principle 4, promotes sustainable productivity through the responsible use of land, ocean, and atmospheric resources [54].

During the 80 s, the Permanent Commission for the South Pacific signed multiple agreements, with binding effects over Colombia, aimed at protecting the marine environment and coastal areas of the South Pacific. These included the 1981 Agreement on Regional Cooperation to Combat Pollution, and the 1983 and 1989 Supplementary Protocols to the Agreement. The Protocol for the Conservation and Management of Protected Marine and Coastal Areas, signed in 1989, aims to preserve natural ecosystems and establish common standards for creating and managing protected areas, while promoting community participation and environmental education.

The Lima Convention on Marine Environmental Protection was signed in 1981 by the 12 countries of the Permanent Commission for the South Pacific (CPPS). The convention highlights the need for cooperation among member countries in establishing and managing MPAs, especially in transboundary areas. Furthermore, the Lima Convention recognizes the role of indigenous peoples and local communities in establishing and managing MPAs and encourages their participation and involvement in decision-making processes.

The Cartagena Convention, adopted in 1983, is also important for Colombian regulation history. It aims to control pollution in the wider Caribbean region and has been ratified by 26 UN member states. The Protocol Concerning Specially Protected Areas and Wildlife (SPAW) was adopted in 1990 as a biodiversity component, focusing on conserving and sustainably using coastal and Caribbean marine biodiversity. It establishes marine protected areas and buffer zones to protect endangered species and their habitats.

The 1992 Rio Summit (UNCED-2) marked a turning point in global environmental policy, leading to policy guidelines for marine protected areas (MPAs) as outlined in Chapter 17 of Agenda 21. The [17] recognizes the importance of protected areas, including MPAs. The CBD also encourages the establishment of transboundary MPAs. The Aichi Biodiversity Targets were adopted in 2010 at the 10th Conference of the Parties to the CBD, aiming to improve biodiversity by safeguarding ecosystems, species, and genetic diversity. Target 11 requires the

protection of at least 17% of terrestrial and inland waters and 10% of marine and coastal areas through effective and equitable management. Target 12 involves the prevention of identified endangered species from extinction and improving their conservation status, particularly for those species that have experienced a significant decline (Convention on Biological Diversity, 2010; [55]). In addition, the Jakarta Mandate of 1995 outlines specific targets and goals for the conservation and sustainable use of biological diversity. Adopted by the signatory countries of the CBD, the mandate guides for countries to develop and implement national strategies to achieve these goals. Marine Protected Areas (MPAs) have been identified as important for achieving the targets.

The Latin American and Caribbean region has made significant progress in creating marine protected areas (MPAs) over the years. As of 2011, over 700 MPAs covered more than 300,000 km2 of coastal waters, accounting for 1.5% of the region’s coastal waters [21,25]. However, despite these efforts, the region is still significantly behind in meeting the CBD Programme of Work on Protected Areas goals, which aim to protect at least 10% of the ocean territory (Fig. 4).

In the 2015 United Nations 2030 Agenda, Sustainable Development Goal 14 (SDG 14) known as "Life Below Water" was established to emphasize the importance of the ocean and the need to conserve and use its resources sustainably. SDG 14 recognizes the ocean’s crucial role in regulating the Earth’s climate, providing food and oxygen, and supporting world trade and transport, all of which are essential for a sustainable future. SDG 14 highlights using marine protected areas (MPAs) to protect marine ecosystems, increase catches and incomes, create new jobs, improve health, and empower women through fishing activities. Additionally, SDG 14 is interconnected with other SDGs, such as SDG 1 on poverty eradication, SDG 2 on zero hunger, SDG 5 on gender equality, SDG 8 on decent work and economic growth, SDG 13 on climate action, and SDG 17 on partnerships for sustainable development.

2.5. Legal history of marine protection in Colombia

In the history of Colombian legislation concerning marine and protected coastal areas, the process can be divided into several temporal periods, each representing significant advances towards environmental protection.

The first historic period began in the 1960 s with the creation of

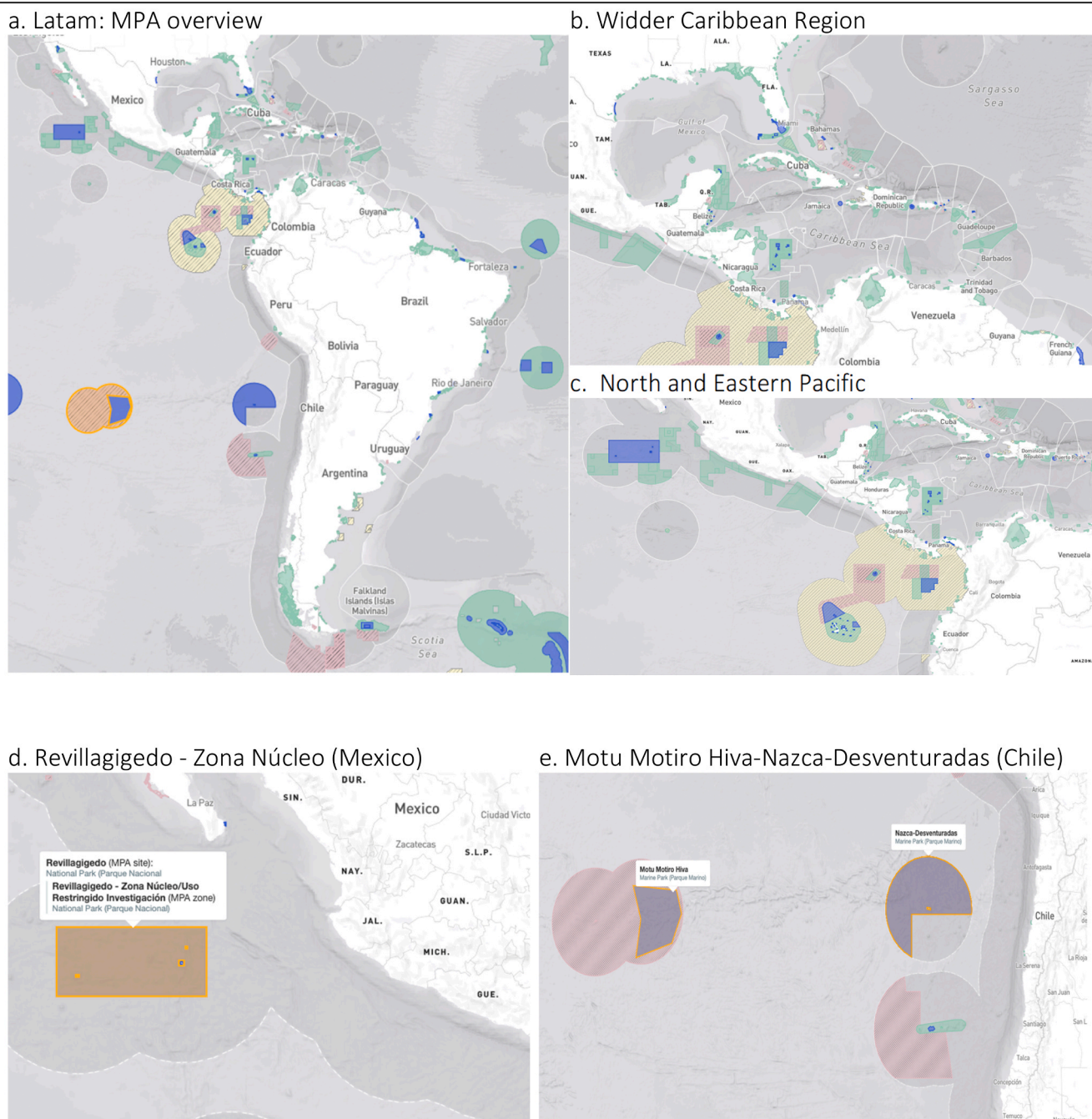


Fig. 4. Latin American MPA overview (a-c) and Largest Fully Protected Areas (d-e): Source: Marine Conservation Institute, 2021, MPAtlas, <https://mpatlas.org/>, last updated 2022-05-17.

protected areas in the national territory, primarily through National Parks and other types of protected areas such as wildlife and flora sanctuaries. The second historic period emerged during the 1970 s, when Colombia prepared to enter into international commitments derived mainly from the Stockholm Meeting of 1972, resulting in the country aligning itself towards conservation processes, and the emergence of public policy guidelines directed towards this goal began.

The third historic period took place during the 1990 s, when Colombia's environmental public policy structure was consolidated, and institutions were transformed, going from simple administrative departments attached to ministries to systemic structures. The fourth and final historic period began with the entry into the 21st century, which marked a turning point in structuring sectoral environmental public

policies. The Organic Territorial Ordering Law of 2011 established the mechanisms for articulation between governance levels, providing the basis for creating the Regional Systems of Protected Areas (SIRAP). These historic periods represent significant steps towards the protection of Colombia's marine and coastal resources and their sustainable use.

2.5.1. 1960 s: The birth of an idea

In the 1960 s, Colombia began creating protected areas within its national territory, following the example of other Latin American countries, such as Mexico, which had implemented conservation since the late 19th century, when the Monte Vedado del Mineral del Chico National Forest was created in Hidalgo province. This was achieved through the establishment of National Parks and other types of protected

areas. However, this period coincided with a significant political upheaval in Colombia due to the emergence of insurgent movements demanding greater popular participation in land distribution. As a result, the creation of these protected areas was not without conflict with these groups and communities. While these movements focused on continental zones, the coastal areas with lower population density and fewer territorial conflicts presented other types of conflicts such as possessing territories with historical property characteristics (Royal Cédulas).

Colombia has been implementing a conservation strategy since the 1960 s, by designating protected land and sea areas. Private initiatives for conservation have also been observed in the country since 1932, such as the Meremberg estate in Huila managed by the Büch Kolsdorf family. The family began implementing sustainable environmental and social practices on the estate long before such practices became prevalent in Colombia [41]. In 1964, the first marine protected area in Colombian history was established, namely the National Park of Isla de Salamanca, which covers an area of 292 km² (Fig. 2). In 1969 the emblematic Tayrona National Natural Park was created. However, this area is still classified as "less protected" after several decades, according to MPAtlas.

Colombia's efforts to establish protected areas have been ongoing for decades, with the Isla de Salamanca National Park being a significant milestone. However, despite the existence of such protected areas, there is still a need for continued efforts to enhance their protection levels. The low level of protection for Isla de Salamanca National Park, as classified by MPAtlas, serves as a reminder of the importance of ongoing efforts to ensure these areas' effective management and protection. In addition, the role of private initiatives, such as the Meremberg estate, in promoting conservation and sustainable practices in Colombia should be recognized and encouraged to supplement governmental efforts in protecting the country's natural resources.

Despite the obstacles encountered, establishing these protected areas represented a critical milestone in preserving Colombia's natural resources. These areas were created to safeguard the country's natural heritage for future generations. These significant achievements provided a sanctuary for many plant and animal species and paved the way for vital ecosystem services such as water regulation, carbon sequestration, and soil conservation.

2.5.2. 1970–1980 s: The creation of specific environmental legislation

In the 1970 s and 1980 s, Colombia began to take significant steps towards fulfilling its international commitments regarding environmental conservation, primarily resulting from the country's participation in the 1972 Stockholm Conference. This event helped Colombia align itself with conservation processes and led to the development of public policy guidelines aimed at environmental protection. The country's efforts during this period were evident in enacting the first natural resources code, Decree-Law 2811 de 1974, which established the figure of national parks as protected areas and defined regulations for the protection of natural resources in the country. It also led to the establishment of legislation with environmental characteristics, which legally created conservation areas, including the first coastal national park.

Adopting environmental regulations in Colombia in the 1970 and 1980 s marked a significant shift towards protecting and conserving natural resources. These regulations paved the way for establishing conservation areas in the country, including national parks and protected areas, which are crucial for preserving the country's rich biodiversity. In addition, the country's environmental policy framework enormously evolved in these years, enacting compelling environmental laws and decrees (Table 1).

The period between 1970 and 80 s was a significant milestone for Colombia's environmental policies, with the enactment of laws and regulations aimed at conserving the country's natural resources. During this period, conservation ideas based on the designation of protected geographical areas were incorporated into a regulatory framework that established the foundation for what would later become the National

Table 1

The beginning of specific environmental legislation.

Legislation	Relevance to Marine Protection
Law number 23 of 1973	The purpose of this law is to prevent and control environmental pollution and strive for the improvement, conservation, and restoration of renewable natural resources, in order to protect the health and well-being of all inhabitants of the National Territory.
Decree-Law 2811 de 1974 natural resources code	Enacted the creation of the Ministry of the Environment; the restructuring of public administration for the management and preservation of the environment and renewable natural resources.
Decree No. 622 of 1977	General regulations are applied to all areas with exceptional values for the National heritage. These areas are reserved and declared as one of the types of areas defined in Article 329 of Decree Law 2811 of 1974, due to their natural characteristics and for the benefit of the inhabitants of the Nation.
Decree 1608 of 1978	This statute regulates the preservation, utilization, and restoration of wildlife. It covers the establishment of reserves, hunting regulations, wildlife repopulation, obligations, prohibitions, control measures, and administrative function.
Decree 1681 of 1978	This regulation covers the management and utilization of hydrobiological resources, including reserves, fishing permits, activities, commercialization, resource protection, and sanctions. It also addresses vessel registration, artisanal fishing, fees, and the functions of the environmental authority.

Source: The authors

Environmental System (SINA) under Law 99 of 1993.

Although Colombia experienced a surge in environmental legislation during the 1970 s and 1980 s, including the creation of the first natural resources code and legislation with environmental characteristics, marine conservation areas were not a priority. Only one marine protected area, Los Flamencos, was established during this period. Los Flamencos, which covers 10 km², was created in 1977 and remained a significant milestone in protecting marine biodiversity in Colombia. However, it wasn't until the 2000 s that the Colombian government began to concentrate on developing more marine protected areas. It is worth noting that despite the increased awareness of the importance of conservation and sustainable use of natural resources, progress towards marine conservation was slow during this period.

2.5.3. 1990 s: The normative consolidation

During the 1990 s, a structure of environmental public policy was consolidated in Colombia, transforming institutions from simple administrative departments under ministries to a systemic structure. This was achieved by creating the National Environmental System, by issuing Law 99 of 1993, and the new environment status based on what was established in the National Political Constitution of 1991.

Colombia's active participation in the 1992 Rio Summit and adherence to international agreements such as Agenda 21 and the 1995 Jakarta Mandate consolidated the country's position on the international stage regarding creating and structuring protected areas. In addition, through the issuance of Law 388 of 1997, the government fully integrated protected areas as part of territorial planning, adopting approaches such as the Integrated Management of Coastal Zones and later Marine Spatial Planning.

This period was characterized by normative consolidation (Table 2), starting from the constitutional mandate and international commitments that the country acquired in conservation matters, based on the premise of the designation of geographically defined areas for their ecological importance. However, the most significant feature was recognizing the coastal area as a space of particular fragility and complexity for its conservation and strategic importance.

Table 2
The normative consolidation.

Legislation	Relevance to Marine Protection
Colombian Constitution of 1991	Establishes state responsibility to protect natural resources and biodiversity, including marine and coastal areas.
Law No. 99 of 1993	Creates the National Environmental System (SINA) and designates protection, conservation, use, and management of marine and coastal areas as part of its regulatory competence.
Law No. 165 of 1994	This is the approval of the "Convention on Biological Diversity," signed in Rio de Janeiro on June 5, [17].
Decree No. 216 of 2003	The purpose of this decree is to declare, delineate, and demarcate the areas within the National System of Natural National Parks and other protected areas.

Source: The authors

The Colombian Constitution of 1991 marked a significant shift in the legal perspective of the Colombian state's responsibility towards natural resources. It entrusted the government with the task of protecting the country's cultural and natural heritage, as specified in Article 8. Additionally, Article 79 places the responsibility on the state to safeguard the diversity and integrity of the natural environment by preserving ecologically significant areas and promoting education to achieve these goals. Furthermore, Article 80 mandates the integration of the conservation agenda into natural resource management and requires international cooperation in protecting transboundary ecosystems. In Article 63, the Constitution also establishes the legal nature of protected areas by defining natural parks as inalienable.

The National Environmental System (SINA) was established by Law No. 99 of 1993, which highlights the protection and sustainable use of the country's biological diversity as a human heritage in Article 1. The creation of SINA reflects Colombia's considerable progress in environmental conservation, as evidenced by the consolidation of the environmental policy framework during the 1990s.

The SINA is a comprehensive framework for environmental policy and management. The SINA is network of institutions responsible for environmental management and regulation. It was established to ensure that environmental protection and management are integrated into all areas of public policy and decision-making processes, monitoring compliance, and providing technical assistance and environmental education to stakeholders.

The SINA is also responsible for designated and managing protected areas, such as national parks, wildlife reserves, and other ecologically significant sites. It provides a framework for the planning and management of these areas and the development of sustainable tourism and other economic activities that do not compromise their ecological integrity. Therefore, the state initiated the process of developing sectoral policies for environmental protection, especially in the realization of the national protected area system (SINAP), and in creating sectoral sub-systems, among which the Marine Protected Area System (SAMP) can be pointed out.

Law No. 165 of 1994 introduced the concept of in situ conservation by establishing a system of protected areas for conserving biodiversity. Colombia ratified the CBD and subsequently developed a National Biodiversity Policy, committing to create and strengthen a National System of Protected Areas (SINAP), with a target of designating at least 10% of the national territory in coastal areas as protected areas. According to the Administrative Unit of the National Natural Park System (UAESPNN) (2007), SINAP is a collection of protected areas at the national, regional, or local level, under the governance of public, private, or community entities, aimed at achieving the conservation goals specified in the 1991 Constitution. The coordination of SINA's creation and integration is the responsibility of the Special Administrative Unit of the UAESPNN, as designated by Decree No. 216 of 2003.

Law No. 388 of 1997 established the legal framework for land use planning, amending Law No. 9 of 1989 and Law No. 3 of 1991. The norm

recognizes the country's unique regional, natural, and cultural diversity, highlighting the important role that protected areas play in maintaining the environmental order of the territory. This law introduced new instruments to regulate the dynamics of territorial transformation to optimize the use and conservation of natural resources. Article 10 of the regulation mandates that the Land Use Plan (POT) must take into account the special management areas defined in Article 10 of Law No. 388 of 1997.

The measures taken during this period underscored the significance of the coastal zone as a fragile and complex space for conservation and strategic importance. Despite this, no new MPAs were established during this time. The most significant development during this period was the consolidation of regulations, starting with the constitutional mandate and international commitments made by the country regarding conservation issues, which focused on designating geographically defined areas of ecological importance.

2.5.4. 2000–2010 s: The implementation of marine protected areas

The years 2000 and 2010 mark a turning point in the development of environmental policies. The Organic Law on Territorial Planning, also known as Law 1454 of 2011, establishes the mechanisms for coordination between governance levels. This law lays the foundation for creating Regional Systems of Protected Areas (SIRAP), which aim to unite different regions, actors, and users. SIRAP aims to respond to the growing pressure of anthropogenic factors on protected areas. It encourages regional coordination among different actors (government, civil society, industry, communities) at different governance levels (national, regional, municipal).

During this period, the government's executive branch issued several significant decrees, regulations, and norms. However, there was a notable predominance of CONPES (National Council for Economic and Social Policy) documents, which serve as policy guidelines to guide the Colombian government's decision-making process. Although not legally binding, these documents provide recommendations for addressing environmental protection in Colombia. In fact, since the year 2000 19 MPAs have been implemented, 3 others minor MPAs have been declared, and the great Easter Pacific Corridor, expected to be the new biggest transnational MPA in the world, has also been declared (Fig. 4).

2.5.4.1. Decrees. Decree No. 2372 of 2010 is nowadays the consolidated rule that defines protected areas and their classification. It includes seven categories of protected areas, namely National Natural Parks PNN, Protective Forest Reserves RFP, National Regional Parks PNR, Integrated Management Districts DMI, Soil Conservation Districts DCS, Recreation Areas AR, Civil Society Nature Reserves RNSC (in Spanish Parques Nacionales Naturales PNN, Reservas Forestales Protectoras RFP, Parques Nacionales Regionales PNR, Distritos de Manejo Integrado DMI, Distritos de Conservación de Suelos DCS, Áreas de Recreación AR, Reservas Naturales de la Sociedad Civil RNSC).

Decree No. 1120 of 2013 established the Coastal Environmental Unit (UAC) and Joint Commissions. Procedures and standards for seagrass activity restriction are now included in Unique Decree No. 1076 of 2015 and subsequent Decrees. The UAC manages and organizes coastal areas with unique characteristics and similar structural and functional conditions. Joint Commissions adopt ecosystem-based management criteria to establish connections between sectoral entities during the UAC zoning process, as per Article 29(3) of Law No. 99 of 1993 [32].

Similarly, Article 2.2.4.2.3.1 of Decree No. 1076 of 2015 states that an Integrated Management Plan for Coastal Environmental Units (POMIUAC) is a planning tool approved by the Joint Commission or Environmental Authority for determining and guiding appropriate planning and management of coastal environments. According to Law No. 388 of 1997, POMIAC is a mandatory higher-level environmental determinant for creating and adopting land use plans in coastal areas.

The conservation strategy of SINAP comprises several systems and

subsystems, including the regional protected area subsystem (SIRAP) defined in Article 9 of Law No. 2372 of 2010, now Article 2.2.2.1.1.9 of Decree No. 1076 of 2015. Subsystems within SIRAP can be established based on geographical or social criteria, and the protection goals determine the limits. These provisions are also stated in Decree No. 1076 of 2015 and Decree No. 2372 of 2010.

2.5.4.2. CONPES. The legal and institutional context for national biodiversity conservation initiatives in Colombia is detailed in CONPES 3680, a document from 2010. This document specifically focuses on the creation and management of protected areas, with an emphasis on marine areas. Despite notable progress in conservation efforts, the CONPES 3680 document points out that there is still much room for improvement in ecological representation and management.

In compliance with international obligations for conservation and environmental protection under the Convention on Biological Diversity (approved by Law No. 165 of 1994), Colombia has established a public policy framework for protected areas (CONPES 3680 of 2010) and an institutional framework around SINAP (Decree No. 2372 of 2010). However, these standards are inadequate for adequately protecting and conserving Colombia's marine environment.

The Colombian government has developed public policy guidelines to safeguard marine ecosystems since the mid-1990s. The Política Nacional de Biodiversidad 1996 was the country's first biodiversity conservation policy, emphasizing the sustainable use of biodiversity and sharing the benefits. In 2001, the National Environmental Council (CNA) authorized the Colombian National Environmental Policy for Marine Space and the Sustainable Development of Coastal and Insular Areas (PNAOCI). In addition, the Colombian Ocean Commission (CCO) approved the National Marine and Coastal Space Policy (PNOEC) in July 2007. These two policies have been instrumental in developing actions to address maritime issues in Colombia.

The Colombian National Environmental Policy for Marine Space and the Sustainable Development of Coastal and Insular Areas (PNAOCI) aims to promote sustainable development of marine and coastal areas while protecting and conserving their ecosystems and resources. PNAOCI defines three integrated territorial environmental planning and sequencing areas to achieve this objective: the Caribbean Islands, the Continental and Insular Caribbean Region, and the Pacific Ocean. These areas are structured around policies and public and private actions aimed at promoting sustainable development, and are supported by environmental units, some of a coastal nature (UAC) and others of an oceanic nature (UAO), to facilitate an integrated management approach. The 2002–2004 Action Plan, as defined by CONPES 3164, further supports PNAOCI by coordinating public and private actions aimed at sustainable development across these areas.

The Colombian government has adopted the CONPES 3990 document, a strategic policy focusing on the sustainable development of maritime territories in Colombia. This policy aims to position Colombia as a bio-oceanic power, emphasizing enhancing the sustainable development of coastal, marine, and island regions, while improving collaboration between the entities responsible for promoting the country's bio-oceanic mission. The policy aims to identify long-term strategic commitments that align with the Sustainable Development Goals and support national development plans. This policy is the first to consider the strategic interests of the Colombian oceans in the National Development Plan. The specific objectives of the policy include strengthening institutions for ocean governance, improving maritime security, promoting research and scientific innovation in maritime activities, and developing offshore economic activities to increase the impact on national growth and competitiveness [39].

2.5.5. Assessing the present condition

A policy framework has been established to address the need for conserving ecologically and strategically important areas, leading to the

concept of "strategic ecosystems". While the creation of these areas has been ongoing since the 1960s, a specific regulatory framework was consolidated with the enactment of Decree 2372 of 2010, which regulates an earlier law such as Decree-Law 2811 of 1974 (National Code of Renewable Natural Resources) and Law 99 of 1993, which establishes the National Environmental System. Furthermore, the cited regulation also responds to the country's international commitments by ratifying the Convention on Biological Diversity (CBD) by Law 165 of 1994. Decree 2372 also allows for creating protected area management subsystems, including regional and thematic subsystems (article 8), aiming to pool efforts among actors within an identified region based on geographic location. Thematic subsystems can be created at the departmental (provincial) level or be strictly thematic, such as the marine-coastal subsystems, including the Subsystem of Protected Marine Areas (SAMP) in the Caribbean and Pacific regions.

Marine protected areas are reported to be, by 2022, 128,171 square kilometers according to the National Unique Register of Protected Areas (RUNAP), which designates territories as protected areas under the Administrative Unit of Natural Parks of Colombia. The Marine Conservation Institute, however, reports slightly different figures, recognizing a protected area of 116,800 square kilometers (see Fig. 5 and Table 3). Both RUNAP and MCI data confirm that Colombia quantitatively achieves the goal set by Aichi Target 11. The total area of Colombian waters is 744,085 square kilometers, and 116,800 square kilometers of marine protected areas have been implemented.

Colombia has successfully protected 15.7% of its marine territory, surpassing the Aichi target of 10%. However, only 3.8% of the marine territory, equivalent to 28,595 square kilometers, falls within full or highly protected areas (blue sports in Fig. 5). Therefore, Colombia's current challenge is improving the quality of marine protection in its existing Marine Protected Areas (MPAs). Table 3 indicates that most of the protected areas are not at the highest level of protection, and some of these MPAs do not include any marine territory, highlighting the need for a more ecosystem-based approach to marine conservation in public policy.

The significant increase in the number of MPAs in recent years can be attributed to the inclusion of a new type of protected area in Colombia, known as RNSC or "Natural Reserve of Civil Society". This protected area category allows private individuals, organizations, and local communities to establish and manage their own conservation areas with legal recognition and support from the government. RNSCs are seen as a positive development involving private initiatives in conserving ecologically important areas. However, it should be noted that in some cases, RNSCs cover more land than coastal and marine space, and other factors must be taken into consideration.

At the national level, it is necessary to move beyond the quantitative measurement of the square kilometers of marine protected areas (MPAs) and focus on strategies to improve their effectiveness [11,45]. Despite expressing intentions to protect these areas, the designation of large MPAs, particularly in developing countries, often prioritizes short-term political goals over environmental goals. Simply declaring an MPA is not sufficient to achieve conservation outcomes, particularly when it comes to marine areas, where monitoring and achieving objectives are complicated tasks.

Meeting Aichi Target 11 is not just a matter of reaching numerical percentages but requires a more complex process. Protecting sensitive marine ecosystems, such as coral reefs and mangroves, is crucial in MPAs, which must be adequately protected. While progress has been made, much work remains to prevent MPAs from becoming "paper parks" [42].

3. Conclusion

This study offers a thorough understanding of Colombia's legal framework for marine conservation, taking into account its evolution and international context. By highlighting the progress made towards

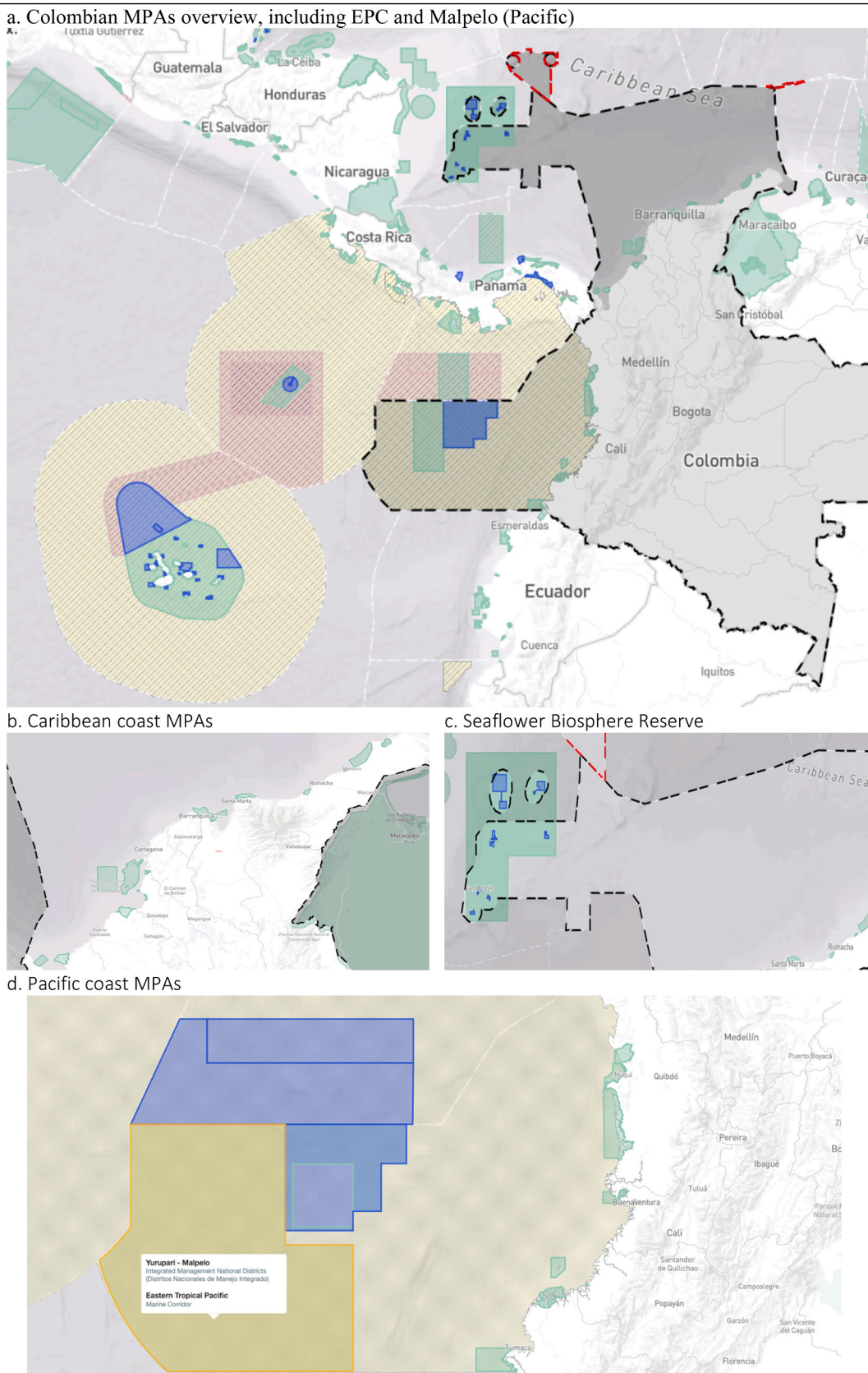


Fig. 5. Colombian MPAs.
 Source: Marine Conservation Institute, 2021, MPAtlas, <https://mpatlas.org/>, last updated 2022–05–17.

Table 3
Total Marine Protected Areas (Colombia).

Name	Area (km ²)	Protection Level MCI*	Year
Isla de Salamanca	292	Less Protected	1964
Tayrona	64	Less Protected	1969
Los Flamencos	10	Less Protected	1977
Gorgona	586	Less Protected	1985
Malpelo	26,659	Fully / Highly Protected	1995
Uramba Bay Malaga	457	Less Protected	2000
Utria	127	Less Protected	2000
Seaflower Biosphere Reserve Marine Protected Area	60,807	Less Protected	2005
The Corals of Rosario and San Bernardo	1227	Less Protected	2005
El Comedero	4	Less Protected	2010
Musichi	8	Less Protected	2010
Yurupari - Malpelo	26,871	Less Protected	2011
Deep Corals	1422	Less Protected	2011
Cape Mangroves Bajo Mira and Frontera	1809	Less Protected	2013
Gulf of Tribuga Cabo Corrientes	565	Less Protected	2014
Sanquianga	230	Less Protected	2014
Pastos Marinos Sawairu	671	Less Protected	2014
Acandi Playon Y Playona	262	Less Protected	2014
Bay Portete Kaurrele	117	Less Protected	2014
Cove of Rionegro, Marimonda and the Salado	49	Less Protected	2014
Mangrove of Cispata Bay Estuarine of the Sinu River	14	Less Protected	2016
Charm of the Bajo Baudo mangroves	2119	Less Protected	2017
Seaflower Biosphere Reserve Marine Protected Area	1974	Fully / Highly Protected	2018
Malpelo (Expansion)	17,088	Less Protected	2019
Sistema Manglarico del Sector de la Boca de Guacamaya	0	Less Protected / Unknown	Unknown
Sanguare	0	Less Protected / Unknown	Unknown
El Corchal	0	Less Protected / Unknown	Unknown

* Level of protection according to Marine Conservation Institute
Source: Marine Conservation Institute, 2021, MPAtlas, <https://mpatlas.org/> last updated 2022-05-17

meeting international marine conservation goals through a periodization of Colombia's legal history, the study provides valuable insights into the prospects for future regulatory frameworks. Moreover, the inclusion of a rich bibliography and detailed geographic maps enhances the study's comprehensiveness and contributes to a better understanding of the complex issues surrounding marine conservation.

The assessment of the past sixty years of environmental conservation policies reveals both successes and failures. While progress has been made in implementing public policies aimed at protecting ecologically and environmentally unique areas, the majority of these policies have fallen short of achieving their objectives. Implementing effective evaluation mechanisms remains unclear, and there is a lack of follow-up on the pressures exerted on these protected areas. The country has a considerable legal framework, including zoning mechanisms, planning and land use management tools, and community participation guidelines. However, corruption and internal conflicts have made implementing these mechanisms challenging. Despite advances in scientific research, its impact on public policies, legislation, and planning tools remains limited. Therefore, to improve environmental conservation policies, it is crucial to prioritize the implementation of effective evaluation mechanisms, address community participation challenges, and increase scientific research's impact on policy implementation.

From a legal and political standpoint, there has been notable progress at the national level in terms of public policies for the conservation of marine and oceanic spaces, particularly in terms of conceptualization and political discourse that combines conservation and utilization.

However, the vision remains predominantly extractive, despite the inclusion of new concepts such as Coastal Environmental Units and Comprehensive Territorial Organization Plans for Coastal Environmental Units. Implementing evaluation mechanisms to measure designed strategies' real and on-the-ground effectiveness concretely is not entirely clear. The focus is specifically on accounting space in square kilometers and the number of spaces created, rather than on monitoring what happens within them and the pressures they face. The most common cause for this is the lack of funds allocated for their maintenance and control.

From a technical perspective, the integration of zoning guidelines into planning tools, as mentioned earlier, is reflected in Resolution 768 of 2017 by the Ministry of Environment. However, the implementation process has been delayed due to stakeholder consultation and ecosystem-based planning challenges. It should be noted that the Colombian regulatory model allows for diverse uses of protected areas, including ecotourism, recreation, sustainable use of natural resources, scientific research, and education. These activities must be meticulously planned and managed to ensure they align with the conservation objectives of the protected area, while minimizing their impact on the ecosystem and biodiversity. In some existing protected areas, sustainable harvesting of natural resources such as timber, non-timber forest products, and fisheries may be permitted, but only if carried out at levels that do not compromise long-term conservation objectives.

The involvement of communities in the implementation and management processes of MPAs is clearly established in national legislation, and mechanisms for participation (in their various phases, preparation, discussion, and implementation) are gradually being consolidated. This involves recognizing ethnic communities as actors in the process, which was enshrined in the 1991 Constitution and Colombia's adherence to the principles established in ILO Convention 169 of 1989 (Law 21 of 1991). However, political corruption and internal public order situations (armed conflict) implement these mechanisms complex.

Spatial delimitation mechanisms for protection purposes are advancing at different speeds in comparison to other vectors. On the one hand, sectorial public policies established for long periods and generally covering broad geographic areas, are often influenced by political interests, limited governance visions, and are fragmented over time. These policies give rise to regulatory and legislative frameworks that, during negotiation processes with interest groups, become diluted reflections of the original objectives stated in the policies. On the other hand, planning tools have a structure on paper that takes into account different factors such as actors, funding, logistical capacity, and evaluation and monitoring methodologies. Still, they are often overtaken by factual reality. Scientific research has a limited impact and influence on other aspects such as public policies, legislation, and planning tools, even though it contributes to the theoretical formulation of solutions that are rarely materialized in concrete actions.

While the existence of various management categories may allow for better management of protected areas by adapting to the specific needs of each zone, the excessive diversity of categories can also lead to confusion and difficulties in managing and monitoring these areas and in some protected areas receiving less attention and relevance compared to others, which can negatively impact their effective conservation. Thus, it is crucial to critically evaluate the efficacy and relevance of each management category to ensure more effective and sustainable management of protected areas in Colombia. A simplified classification system should be established, based on conservation objectives, natural characteristics, and allowed uses and activities, following the international standardization proposed by the IUCN.

In addition, the absence of adequate tools to monitor and regulate fishing and other economic activities in marine and protected coastal areas within SINAP hinders the capacity of national and regional entities to control illegal activities in these areas effectively. Moreover, the functioning of marine and coastal resources inside and outside SINAP is compromised by varying pressures on ecosystems, leading to the loss of

living aquatic resources, reduced functioning, and jeopardized biodiversity and ecosystem services. Consequently, to address these challenges, Colombia must evaluate existing and new pressures on the ocean and advance ecosystem-based ocean management.

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Author Statement

DHG, RLM, AB and CBM, conceived the research; CBM and DHG analyzed the results; DHG, AB, and CBM discussed the scenarios and analyzed the data; CBM, RLM, and DHG wrote the manuscript.

Data Availability

Data will be made available on request.

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