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THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY IN AREAS BEYOND NATIONAL JURISDICTION OF THE COSTA RICA THERMAL DOME: MOVING FROM *LEX LATA* TO *LEX FERENDA*

BY

MARIAMALIA RODRIGUEZ CHAVES

THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY.

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SCHOOL OF LAW

COLLEGE OF BUSINESS, LAW & PUBLIC POLICY

NATIONAL UNIVERSITY OF IRELAND GALWAY

SEPTEMBER, 2017

DECLARATION

I, **Mariamalia Rodríguez Chaves**, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the National University of Ireland Galway, School of Law, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Mariamalia Rodríguez Chaves

5 September 2017

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ABMT Area-based Management Tool

ABNJ Areas Beyond National Jurisdiction

AIDCP Agreement on the International Dolphin Conservation Program

APEI Areas of Particular Environmental Interest

ASMA Antarctic Specially Managed Areas

ASPA Antarctic Specially Protected Areas

ATLAS Trans-Atlantic assessment and deep-water ecosystem-based spatial management plan for Europe

ATS Antarctic Treaty System

BBNJ Biodiversity Beyond National Jurisdiction

CBD Convention on Biological Diversity

CCAD Comisión Centroamericana de Ambiente y Desarrollo (Central American Commission on Environment and Development)

CCAMLR Commission on the Conservation of Antarctic Marine Living Resources

CCCC Comisión Centroamericana de Cambio Climático (Central American Council on Climate Change)

CCSBT Commission for the Conservation of Southern Bluefin Tuna

CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora

CLCS Commission on the Limits of the Continental Shelf

CMS Convention on the Conservation of Migratory Species of Wild Animals

COCATRAM Comisión Centromericana de Transporte Marítimo (Central American Commission for Maritime Transportation)

COP Conference of the Parties

CPPS Comisión Permanente del Pacífico Sur (Permanent Commission for the South Pacific)

CRD Costa Rica Dome

CRFM Caribbean Regional Fisheries Mechanism

EBSA Ecologically or Biologically Significant Area

EEZ Exclusive Economic Zone

EIA Environmental Impact Assessment

ENSO El Niño-Southern Oscillation

EU European Union

FAO Food and Agriculture Organisation

GFCM General Fisheries Commission for the Mediterranean

GOBI Global Ocean Biodiversity Initiative

IAC Inter-American Convention for the Protection and Conservation of Sea Turtles

IATTC Inter-American Tropical Tuna Commission

ICCAT International Commission for the Conservation of Atlantic Tunas

ICRW International Convention for the Regulation of Whaling

IGO Intergovernmental Organisation

ILBI International Legally Binding Instrument

ILO International Labour Organisation

IMAP Integrated Monitoring and Assessment Programmes

IMO International Maritime Organisation

IPCC Intergovernmental Panel on Climate Change

IOC Intergovernmental Oceanographic Commission

ISA International Seabed Authority

ITCZ Inter-Tropical Convergence Zone

ITLOS International Tribunal for the Law of the Sea

IUU fishing Illegal, Unreported and Unregulated Fishing

IWC International Whaling Commission

UNCLOS United Nations Law of the Sea Convention

MARPOL Convention for the Prevention of Pollution from Ships

MGR Marine Genetic Resources

MoU Memorandum of Understanding

MPA Marine Protected Area

MSR Marine Scientific Reseacrh

NAFO Northwest Atlantic Fisheries Organisation

NEAFC North-East Atlantic Fisheries Commission

NGO Non-Governmental Organisation

NOAA National Oceanic and Atmospheric Administration

OBIS Ocean Biogeographic Information System

OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic

OSPESCA Organización del Sector Pesquero y Acuícola del Istmo Centroamericano (Central American Fisheries and Aquaculture Organisation)

OUV Outstanding Universal Value

PrepCom Preparatory Committee

PSMA FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing

PSSA Particularly Sensitive Sea Area

QSR Quality Status Report

RAC Regional Activities Centres

RFMO Regional Fisheries Management Organisation

SEA Strategic Environmental Assessment

SDG Sustainable Development Goals

SICA Sistema de Integración Centroamericana (Central American Integration System)

SPA Specially Protected Areas

SPAMI Specially Protected Areas of Mediterranean Importance

SPRFMO South Pacific Regional Fisheries Organisation

TED Turtle Excluder Devices

TMT Transfer of Marine Technology

UNEP United Nations Environment Programme

UNESCO United Nations Educational, Scientific and Cultural Organisation

UNGA United Nations General Assembly

UNFSA United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks

UNGA United Nations General Assembly

VME Vulnerable Marine Ecosystem

VMS Vessel Monitoring System

WCPFC Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

WHC World Heritage Convention

WWF World Wildlife Fund

LIST OF INTERNATIONAL CONVENTIONS AND PROTOCOLS

1958 High Seas Convention. 450 UNTS 11. Entered into force 30 September 1962.

1959 Antarctic Treaty. 402 UNTS 71. Entered into force 23 June 1961.

1994 Agreement Relating to the Implementation of Part XI of the UNCLOS of 10 December 1982. 1836 UNTS 42. Entered into force July 28 1996.

Abidjan Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region. 1316 UNTS 205. Entered into force 5 August 1984.

Barcelona Convention. Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean.

Barcelona Convention. Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft.

Barcelona Convention. Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-based Sources and Activities.

Barcelona Convention. Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal.

Barcelona Convention. Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil.

Barcelona Convention. Protocol on Integrated Coastal Zone Management in the Mediterranean.

Central American Convention on Climate Change. Signed 29 October 1993.

Code of Conduct for Responsible Fisheries. Adopted 31 October 1995.

Convention Concerning the Protection of the World Cultural and Natural Heritage. 1037 UNTS 151. Entered into force 17 December 1975.

Convention Establishing the Central American Commission on Environment and Development. Signed 12 December 1989.

Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific. Adopted 18 February 2002.

Convention for the Conservation of the Biodiversity and the Protection of Wilderness Areas in Central America. Entered into force 20 December 1994.

Convention for the Establishment of the Inter-American Tropical Tuna Commission. 80 UNTS 3. Entered into force 3 March 1950.

Convention for the Prevention of Pollution from Ships. 1340 UNTS 184. Adopted 2 November 1973.

Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. 1506 UNTS 157. Entered into force 11 October 1986.

Convention for the Protection of the Marine Environment of the North-East Atlantic. 2354 UNTS 67. Entered into force 25 March 1998.

Convention on Biological Diversity. 1760 UNTS 79. Entered into force 29 December 1993.

Convention on Environmental Impact Assessment in a Trans-boundary Context 1989. UNTS 310. Entered into force 10 September 1997 and complementary Protocol on Strategic Environmental Assessment. 2685 UNTS. Entered into force 11 July 2010.

Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries. 1135 UNTS 369. Entered into force 1 January 1979.

Convention on International Trade in Endangered Species of Wild Flora and Fauna. 993 UNTS 243. Entered into force 1 July 1975.

Convention on Migratory Species. 1651 UNTS 333. Entered into force 1 November 1983.
Convention on the conservation of Antarctic marine living resources. UNTS 1329. Entered into force 7 April 1982.

Convention on the Prevention of Marine Pollution by Dumping of Wastes and other matter. 1046 UNTS 120. Entered into force 30 August 1975.

Convention on the Protection of the Mediterranean Sea against Pollution. 1102 UNTS 27. Entered into force 12 February 1978.

Convention on the Protection of the Underwater Cultural Heritage. 2562 UNTS 3. Entered into force 2 January 2009.

FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas. 2221 UNTS 91. Entered into force 24 April 2003.

Formalization of the Organisation for Fisheries and Aquaculture Sector of the Central American Isthmus (OSPESCA). San Salvador Act. Entered into force 18 December 1995.

Hamilton Declaration. Adopted in Bermuda 11 March 2014.

Inter-American Convention for the Protection and Conservation of Sea Turtles. 2164 UNTS 31. Entered into force 2 May 2001.

International Agreement on the Creation of a Marine Mammal Sanctuary. 2176 UNTS 247. Entered into force 21 February 2002.

International Convention for the Conservation of Atlantic Tunas. 673 UNTS 63. Entered into force 21 March 1969.

International Convention for the Regulation of Whaling. 161 UNTS 72. Entered into force 10 November 1948.

International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties. UNTS 970. Entered into force 6 May 1975.

International Treaty on Plant Genetic Resources for Food and Agriculture. 2400 UNTS 303. Entered into force 29 June 2004.

Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their Utilization to the Convention on Biological Diversity, UN Doc. UNEP/CBD/COP/DEC/X1. Entered into force 12 October 2014.

Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol). 30 ILM 1455. Entered into force 14 January 1998.

Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other than Oil. UNTS 1313. Entered into force 30 March 1983.

Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. 36 ILM 1. Entered into force 24 March 2006.

Special Agreement of the Ministers responsible for Maritime Transportation in Central America. COCATRAM Statutes. Entered into force 11 July 1991.

Tegucigalpa Protocol to the Charter of the Organisation of Central American States. 1695 UNTS 382. Entered into force 23 July 1992.

United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. 2167 UNTS 88. Entered into force 11 December 2001.

United Nations on the Law of the Sea. 1833 UNTS. 3/21 ILM 1261 (1982). Entered into force 16 November 1994.

JURISPRUDENCE

Certain activities carried out by Nicaragua in the border area (Costa Rica v. Nicaragua) and Construction of a road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica). Judgement, I.C.J. Reports 2015.

Definition of the minimum access conditions and exploitation of fisheries resources within the maritime zones under the jurisdiction of Sub-Regional Fisheries Commission (SRFC) Member States. Advisory Opinion. ITLOS Case No. 21, 2015.

Dispute concerning delimitation of the maritime boundary between Bangladesh and Myanmar in the Bay of Bengal (Bangladesh/Myanmar), Judgment, ITLOS Case No. 16, 14 March 2012.

Anklagemyndigheden (Public Prosecutor) v. *P.M. Poulsen and Diva Navigation*, European Court of Justice Case C-286/90, with annotation by P.J. Slot. ECJ 453.

Fisheries Jurisdiction Case (United Kingdom v. Iceland), Judgment, I.C.J. Reports 1974.

Gabčíkovo -Nagymaros Project (*Hungary v Slovakia*), Judgment, I.C.J. Reports 1997.

Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996.

MOX Plant Case (Ireland v United Kingdom), Provisional Measures Order 2001/5, ITLOS Case No. 10, 2001.

Pulp Mills on the River Uruguay (Argentina v. *Uruguay),* Judgment, I.C.J. Reports 2010.

Responsibilities and Obligations of State Sponsoring Persons and Entities with Respect to Activities in the Area, Advisory Opinion, ITLOS Seabed Disputes Chamber, Case No. 17, 2011.

South China Sea Arbitration (The Republic of Philippines v. The People's Republic of China), Permanent Court of Arbitration Case No. 2013-19 (Inter-State arbitration), 2016.

Southern Bluefin Tuna Case (New Zealand-Japan, Australia-Japan), Advisory Opinion, ITLOS Case No. 3, 2000.

Whaling in the Antarctic Case (*Australia v Japan: New Zealand intervening*), Judgment, I.C.J. Reports 2014.

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FIGURE 3. Spatial pattern of tuna catches in the CRD region.

ABSTRACT

The ocean plays an essential role in environmental, social and economic development worldwide. The aim of the study is to examine the scientific, policy and legal reasons underpinning efforts to ensure the conservation and sustainable use of the marine biodiversity in areas beyond national jurisdiction (ABNJ) of the Costa Rica Thermal Dome. For this purpose, the thesis reviews multilateral environmental instruments applicable to the different sectoral activities taking place in ABNJ, along with the shortcomings of such regimes, as well as decisions of international courts and tribunals. Thereafter, it explores the legal and institutional framework in the Central American region and undertakes an assessment of five comparative case studies of regional best practices, along with the main elements under discussion at the BBNJ negotiations at the United Nations, including the leadership role adopted by Costa Rica. The thesis concludes with a proposal for a new regional instrument for the protection and management of the unique biodiversity associated with the CRD in ABNJ.

THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY IN AREAS BEYOND NATIONAL JURISDICTION OF THE COSTA RICA THERMAL DOME: MOVING FROM *LEX LATA* TO *LEX FERENDA*

CHAPTER 1. INTRODUCTION

1.1 THE SUBJECT MATTER AND REASONS FOR THIS STUDY

The ocean is vital to life on the planet and marine ecosystems play an essential role in environmental and socioeconomic development worldwide. With this in mind, the aim of the study is to examine the scientific, policy and legal reasons for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (ABNJ) of the Costa Rica Thermal Dome (CRD). The latter is an area of high primary productivity in the Eastern Tropical Pacific and supports unique habitats for large pelagic fish, marine mammals, seabirds and marine predators such as tuna, dolphins, cetaceans, and is also considered part of a migration corridor for leatherback turtles, among other vulnerable species.

The focus of the legal analysis is a unique bio-oceanographic feature formed by wind and currents, being a geographically mobile area with ambulatory boundaries, whose size and position vary throughout the year, as well as from year to year. In the main, it is located in ABNJ. Moreover, from a law of the sea perspective, it is important to point out that the CRD also straddles a number of sea areas coming under the sovereignty and jurisdiction of Costa Rica, Nicaragua, El Salvador, Guatemala and Mexico. Commercial fisheries, tourism, shipping and scientific research all take place in the CRD. Moreover, the ocean is an integrated system and the CRD provides important ecological services in the form of regulating the climate. The biodiversity and environmental importance of the CRD is undisputed and has attracted considerable attention at domestic and international levels.

The primary reason for undertaking this study is that the CRD urgently needs protection within the framework of international law. Indeed, the world-renowned Sylvia Earle has pointed out that the CRD is exposed to serious threats from a variety of anthropogenic impacts including shipping traffic, overfishing, pollution from marine

and land-based sources, ocean acidification, as well as the adverse and unpredictable effects of climate change.

Legal protection of the CRD is fundamental to ensuring the sustainable development of Central American countries and to maximising its environmental and socioeconomic value.[1] Following on from this, the second reason for the study is to map how international policy on sustainable development is applicable to the CRD and continues to evolve under a number of instruments, including: the 1992 Agenda 21 adopted at the United Nations Conference on Economic Development; the 2000 United Nations Millennium Declaration and subsequent actions, including the 2010 Millennium Development Goals; the 2002 Johannesburg Plan of Implementation adopted at the World Summit on Sustainable Development; and the 2012 Rio + 20 outcome Document "The Future We Want", as well as Goal 14 of the Sustainable Development Goals under the United Nations 2030 Agenda for Sustainable Development. Vitally, the latter calls for the conservation and sustainable use of the oceans, seas and marine resources for sustainable development. In particular, target 14.C of Goal 14 calls for the enhancement of the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea (UNCLOS).

The third reason is to explore how international law and best state practice is also evolving in light of new treaties, modern principles and approaches to international law, along with decisions and jurisprudence of international courts and tribunals. In this context, UNCLOS is a framework treaty and contains few provisions on conservation and sustainable use of marine resources in ABNJ. One way the international community has sought to address this lacuna was through the convening of the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction between 2004 to 2015. Following on from this, the UN General Assembly adopted Resolution 69/292 with the view to making substantive recommendations to the UN General Assembly on a legally binding instrument for the conservation and sustainable use of marine biodiversity in ABNJ, also referred to as the BBNJ process. This process, in turn will conclude before the 72th session of the UN

[1] See Chapter 2. Subsection 2.4.

General Assembly and it is anticipated that it will be followed by an Intergovernmental Conference for the negotiation of an internationally legally binding instrument that implements UNCLOS and Part XII in particular.

Accordingly, a central aspect of the dissertation is to describe how the on-going efforts at the United Nations and the development of an implementation instrument under UNCLOS can influence further regional action to protect the ABNJ biodiversity associated with the CRD. In undertaking this task, a further objective is to explore the role of four regional sectoral organisations in advancing marine resource conservation and biodiversity regimes, namely: the Central American Commission on Environment and Development (CCAD), the Central American Commission for Maritime Transport (COCATRAM), the Central American Fisheries and Aquaculture Organisation (OSPESCA), and the Inter American Tropical Tuna Commission (IATTC).

The fourth reason is to review comparative examples of best legal practices and regional seas cooperation mechanisms for the protection and preservation of biodiversity in order to identify the lessons that can be applied to the CRD in designing a regulatory regime. Examples include the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), the Barcelona Convention, the Antarctic system and evolving frameworks such as the Sargasso Sea and the Permanent Commission for the South Pacific (CPPS). The thesis concludes with a proposal on new regional arrangements for the protection and management of the unique biodiversity associated with the CRD. Ultimately, the *raison d'être* for the study is identify the best means to reverse environmental degradation of the unique biodiversity associated with the CRD. Hopefully, this in turn will open the door to a new chapter of regional marine environmental cooperation in Central America.

1.2 THESIS HYPOTHESIS, RESEARCH QUESTIONS AND SCOPE OF STUDY

1.2.1 Hypothesis

The hypothesis underpinning the study is the need to establish a regional regulatory scheme for the protection of biodiversity in areas of the CRD beyond national jurisdiction as a crucial corollary to the *erga omnes* obligation to protect and preserve the marine environment under international treaty and customary law.

1.2.2 Research Questions

The thesis considers the following research questions and related issues:

I. Identify the legal instruments and area-based management tools that are relevant to the conservation of marine biodiversity in ABNJ, as well as their potential applicability to address the challenges of managing human activities that impinge upon or take place in the CRD.

II. Identify lacunae in the multilateral regulatory framework and why it is necessary to adopt a new implementing agreement under UNCLOS, along with measures for the Eastern Central Pacific in the form of a regional agreement.

III. Are there regional legal and institutional frameworks applicable to marine conservation and sustainable use of marine resources in the Central American region, which, if applied in an effective manner, could form the backbone of efforts to improve the protection and management of CRD biodiversity in ABNJ?

IV. How do regional cooperation mechanisms in the form of UNEP's Regional Seas Programme for Sustainable Development and independent partner programmes advance the conservation and sustainable use of biodiversity in ABNJ? In particular, how do the case studies address the particular elements under discussion in the BBNJ negotiations at the United Nations? And what lessons can be learned and applied in the context of designing a new regulatory architecture for the Costa Rica Dome?

V. Why is there an urgent need to establish a new legally binding instrument for the conservation and sustainable use of marine biodiversity in ABNJ? How has the negotiation process evolved up to August 2017? What are the main elements and principal recommendations of the Preparatory Committee?

VI. How Costa Rica has become a global leader on the conservation of marine biodiversity within the international community. What position has Costa Rica

adopted on the main elements of the package deal under discussion at the BBNJ negotiations?

VII. What are the key features in a new regional treaty for the conservation and sustainable use of biodiversity in ABNJ of the CRD?

1.2.3 Scope of the study

As the CRD is a bio-oceanographic mobile feature, the geographical scope of this study encompasses international and regional legal obligations applicable both within and beyond national jurisdiction. The focus of the study is primarily related to ABNJ as this remains largely unregulated from an environmental perspective. In relation to the material scope, the present study addresses conservation and economic activities related to the sustainable use of marine resources and focuses on several thematic activities, namely: fisheries, protection of marine ecosystems and its biodiversity, commercial shipping, tourism, marine scientific research and bioprospection and seabed mining. The comparative analysis is undertaken against selected regional regimes in order to shed light on best practice, as well as the on-going progressive development of international law under UNCLOS and pursuant to the decisions of international courts and tribunals including the International Tribunal for the Law for the Sea in particular.

1.3 RESEARCH METHODOLOGY AND SOURCE MATERIAL

This is the first legal study of biodiversity conservation in ABNJ of the CRD and the methodology used includes consideration of primary source materials: international treaties, agreements, codes of conduct, and memoranda of understanding. Likewise, normative and jurisprudential sources are reviewed in detail including the case law of international courts and tribunals. Communications and interviews were conducted with legal experts and officials from relevant institutions and international bodies including the United Nations, the European Commission, the Government of Costa Rica, OSPAR, the Barcelona Convention, CCAMLR, the Sargasso Sea Commission, the Permanent Commission for the South Pacific, the Pew Charitable Trust, IUCN, the International Seabed Authority, the UNESCO-IOC, the Governments of Norway, Australia, Nauru, the Federated States of Micronesia. The thesis draws upon the record

of negotiations at the United Nations, including the author's own contemporary notes of proceedings at the two months of deliberations undertaken at the United Nations Preparatory Committee established by General Assembly pursuant to resolution 69/292. Reference is also made to a number of unpublished papers presented at workshops attended by the author and hosted by UC Berkeley School of Law, Columbia Law School, King's College, the Center of Oceans Law and Policy at the University of Virginia, the High Seas Alliance, the Convention on Migratory Species and Sargasso Sea Commission Workshop on European Eel co-convened by the Law of the Sea Group at NUI Galway, and at many side-events at the United Nations.

1.4 STRUCTURE OF THE THESIS

Given the discrete and sometimes disparate nature of the scientific, policy and legal backdrop to the thesis, the research is structured in three separate but interrelated strands. The first strand (chapters 1-5), addresses the international and the regional legal and institutional frameworks applicable to the CRD. An initial introduction in chapter 2 briefly describes the CRD oceanographic features and its associated biodiversity and the economic activities benefiting from this highly productive marine area. Chapter 3 analyses multilateral instruments for protecting biodiversity in ABNJ. Chapter 4 then examines the multilateral sectoral instruments applicable to marine activities in ABNJ. Chapter 5 provides a brief overview on the regional legal and institutional settings and identifies relevant authorities and provisions applicable to the CRD within the Central American region.

Comparative analysis is undertaken in the second strand of the thesis (chapters 6-7). Chapter 6 reviews the legal and institutional framework, as well as the lessons that may be derived from five case studies, namely: the OSPAR and the Barcelona Conventions, as examples of regional best practice regarding the adoption of conservation and management measures including the establishment of MPAs in ABNJ. Chapter 7 examines the Antarctic system and the developing regional arrangements in the Sargasso Sea and the Permanent Commission for the South Pacific (CPPS).

The third strand of the thesis (chapters 8-10) explores the advancements on the negotiations within the BBNJ process, and thereafter, the small State practice based on the Costa Rican expressed positions during the BBNJ discussions in chapter 8.

Successively, chapter 9 sets out a proposal for the establishment of a regional management framework for the CRD taking into consideration the lessons that are derived from the five case studies, as well as the legal and institutional frameworks that exist at regional and multilateral levels. Finally, chapter 10 presents conclusions and recommendations. In doing so, the thesis aims to prove that the regional model is the most apposite mechanism to discharge the *erga omnes* obligation to protect the marine environment and to conserve marine resources under international treaty and customary law.

CHAPTER 2: THE COSTA RICA THERMAL DOME: JURIDICAL, GEOGRAPHICAL, ENVIRONMENTAL AND SOCIO-ECONOMIC CONSIDERATIONS[1]

2.1 INTRODUCTION

The Costa Rica Thermal Dome (hereafter, CRD or Dome) was first observed as an oceanographic phenomenon in 1948[2] and subsequently described in the scientific literature by Cromwell in 1958.[3] Since then, scientists have continued studying the Dome and the resources that it supports, particularly as a productive and lucrative tuna fishery also began to develop in the Eastern Tropical Pacific from the 1950s onwards.[4] In the intervening years, the CRD has remained in international scientific prominence because of its unique oceanographic and biological features from which it derives its name: that is to say, the inverted dome-like shape of the thermocline that marks the boundary between the warm surface water and cold deep water.[5] In 2013, Dr. Sylvia Earle and Mission Blue declared the CRD a Hope Spot, recognizing its critical value for the health of the ocean and which still needed to be safeguarded with laws ensuring the protection and sustainable use of its associated biodiversity.[6] Hope Spots are special places that are critical to the health of the ocean, or in the words of Dr. Earle, they are part of the "Earth's blue heart." Many other superlatives have been used to describe the CRD including the epithet that it is an oasis of productivity.[7] As such, it is considered to be the most interesting oceanographic process in the Eastern Central Pacific, which is

[1] The author would like to thank Ronán Long (Nippon Foundation Professorial Chair of Ocean Governance & the Law of the Sea, World Maritime University); Alfonso Ascencio-Herrera (Legal Counsel & Deputy to the Secretary-General, International Seabed Authority); Sandor Mulsow (Director, Office of Environmental Management and Mineral Resources, International Seabed Authority); Larry Mayer (Professor and Director School of Marine Science and Ocean Engineering Center for Coastal and Ocean Mapping University of New Hampshire); Jorge Jiménez (Director, MarViva Foundation); Marjo Vierros (Adjunct Senior Fellow at the United Nations University Institute of Advanced Studies) for their comments on a preliminary draft of this Chapter.

[2] W. Klaus (1964) 'Upwelling in the Costa Rica Dome,' *Fishery Bulletin*, Vol. 63(2), 355.

[3] T. Cromwell (1958) 'Thermocline topography, horizontal currents and ridging in the Eastern Tropical Pacific,' *Inter-American Tropical Tuna Commission Bulletin*, Vol. 3(3).

[4] P. C. Fiedler (2002) 'The annual cycle and biological effects of the Costa Rica Dome,' *Deep Sea Research I*, Vol. 49, 321.

[5] M. Kahru, et. al., (2007) 'Sea level anomalies control phytoplankton biomass in the Costa Rica Dome area,' *Geophysical Research Letters*, Vol. 34(22). See also: S. P. Xie, et. al., (2005) 'Air–Sea Interaction over the Eastern Pacific Warm Pool: Gap Winds, Thermocline Dome, and Atmospheric Convection,' *Journal of Climate,* Vol. 18(1).

[6] Mission Blue. *Hope Spots*. Available at: https://www.mission-blue.org/hope-spots/)

[7] J. A. Jiménez, *The Thermal Dome of Costa Rica: An oasis of productivity off the Pacific coast of Central America* (San José, Costa Rica: MarViva, 2017), 1.

in a constant state of ephemeral "expansion, contraction and movement depending upon the stage of the annual cycle and the year."[8]

Against this background, the aim of this chapter is to review very briefly and to highlight some of the key features of the CRD from juridical, geographical, scientific, environmental and socio-economic perspectives. In undertaking this task, the chapter starts out by addressing some preliminary matters including the meaning of the terms areas within and beyond national jurisdiction. This is followed by a short description outlining the unique geography, biodiversity, environmental and scientific features of the CRD. The discussion then focuses on three key activities that have significant economic and ecological impacts on the region and pose a potential risk to marine conservation, namely: fisheries, tourism and commercial shipping, as well as the potential risks posed by seabed mining and marine scientific research including marine bioprospection. The findings of scientific studies and reports are reviewed with a view to highlighting the anthropogenic impacts that need to be tackled by any future legislative framework applicable to the CRD. Also, with a view to providing some general context for subsequent chapters of this study, and chapter 9 in particular, the discussion below concludes by emphasising some of the principal conservation risks and management challenges that need to be addressed in protecting and preserving the unique biodiversity associated with the Dome.

2.2 WHERE ARE THE AREAS WITHIN AND BEYOND NATIONAL JURISDICTION?

In accordance with customary and international treaty law, the maritime areas within national jurisdiction are internal waters, the territorial sea, the contiguous zone, archipelagic waters, the exclusive economic zone, and the continental shelf.[9]

The term "beyond the limits of national jurisdiction" is used in the United Nations Convention on the Law of the Sea (hereafter, UNCLOS) in the context of the international seabed area (referred to as the Area),[10] where the ocean floor and its

[8] Ibid. 26
[9] UNCLOS. Articles 2, 3, 4, 33, 47, 56, 76.
[10] UNCLOS. Article 1.1(1).

mineral resources are the common heritage of mankind.[11] In contrast, the term ABNJ is not used in UNCLOS, but is generally understood to refer to both the Area and the high seas.[12] As will be seen in chapter 3, the latter for the purpose of the application of the high seas provisions of UNCLOS is all parts of the sea that are not included in the exclusive economic zone, in the territorial sea, internal waters, or in the archipelagic waters.[13] Accordingly, ABNJ are sea areas beyond the limits of coastal State sovereignty and jurisdiction, where two very distinctive jurisdictional frameworks apply under UNCLOS, namely: the high seas (Part VII) and the regime applicable to the Area (Part XI and Annex III of the Convention).

In determining which areas are beyond national jurisdiction it is important to keep in mind that boundaries of coastal State jurisdiction have not been fully determined worldwide in accordance with the requirements of UNCLOS and customary international law. This is a notable problem in Central America, where Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala and Mexico have all established 200-mile exclusive economic zones on their Pacific coasts.[14] However, not all of the States with adjacent coasts have agreed bilateral maritime boundaries with neighbouring States in relation to their territorial seas, EEZs or continental shelves.[15] This is significant because all States by virtue of international law enjoy sovereignty over continental shelf resources out to 200 nautical miles from the baseline.[16] Furthermore, there is scope for States to establish the outer edge of the continental margin whenever the margin extends beyond 200 nautical miles from the baselines under Article 76 of UNCLOS. For this purpose, only one Central American State, Costa Rica, has made a preliminary submission to the Commission on the Limits of the Continental Shelf (CLCS, hereafter) in relation to the extent of their continental margins beyond 200 miles on the Pacific

[11] UNCLOS. Recital 6.
[12] See: D. Guilfoyle, 'The High Seas' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: Oxford University Press, 2015), 205.
[13] UNCLOS. Article 86. In contrast to the 1958 High Seas Convention, 450 UNTS 11, entered into force 30 September 1962. The term "high seas" is not defined expressly in UNCLOS. See: Guilfoyle, above n 12, 205.
[14] J. I. Charney, R. W. Smith (eds.), *International Maritime Boundaries* (The Hague: Martinus Nijhoff Publishers, 2002). Vol. IV.
[15] Ibid.
[16] UNCLOS. Article 56. The EEZ is a rule of customary international law. See: J. A. Roach, 'Today's Customary International Law of the Sea,' *Ocean Development and International Law*, Vol. 45(3) 2014.

coast.[17] In line with international law, States exercise sovereign rights on the continental shelf in relation to exploring and exploiting non-living resources as well as sedentary species.[18] As will be seen in chapter 3, although there is no specific duty under UNCLOS to conserve and manage continental shelf resources, coastal States have a general obligation to protect the marine environment and to ensure the exploitation of natural resources pursuant to environmental policies.[19] Furthermore, the precise legal regime applicable to the sustainable use and conservation of biodiversity in the water column associated with features on the margin beyond 200 miles is the subject of discussion in international negotiations pertaining to ABNJ as will be seen in further detail in chapter 8.[20]

2.3 GEOGRAPHICAL AND OCEANOGRAPHIC FEATURES OF THE CRD

As can be seen from Figure 1, the CRD is located in the Eastern Tropical Pacific in an area that straddles the high seas and coastal State waters of several Central American countries. The CRD is dynamic, and scientific studies on the unique bio-geographical and oceanographic features of the CRD have indicated that:

> The Costa Rica Dome is a quasi-permanent shoaling of the thermocline with a mean position at 9ºN and 90ºW. It is associated with a cyclonic circulation of surface currents and is seasonally affected by large and coastal-scale wind. Upwelling associated with the cyclonic circulation, combined with the presence of a strong and shallow thermocline, makes the Costa Rica Dome a distinct biological habitat.[21]

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[17] UNCLOS. Article 76(4)-(6). See Preliminary information indicative of the outer limits of the continental shelf beyond 200 nautical miles submitted by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/cri2009informacion_preliminar.pdf and the reservation note made by Nicaragua in relation to the preliminary information by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/nic_re_cri_2010_en.pdf

[18] UNCLOS. Article 77(4).

[19] UNCLOS. Article 192, 194.

[20] See discussion of the concept of adjacency in Chapter 8 and note 70 in Chapter 3.

[21] L. T. Ballance, R. L. Pitman, P. C. Fiedler (2006) 'Oceanographic influences on seabirds and cetaceans of the Eastern Tropical Pacific: A review,' *Progress in Oceanography*, Vol. 69(2–4), 366.

Ballance, Pitman and Fiedler[22] have described the CRD as a shoaling of the generally strong, shallow thermocline with cold nutrient-rich upwelling.[23] From a legal perspective, as can also be seen from Figure 1, it is significant to note that the core area of the CRD has a persistent location in ABNJ, but can vary in size and position throughout the year, for example, the east–west dimension of the Dome increases from 300km^2 in June to 1000km^2 in November.[24] Again, from a Law of the Sea perspective, it is important to keep in mind that the CRD is mainly located in the high seas but also straddles a number of sea areas under the jurisdiction of Costa Rica, Nicaragua, El Salvador, Honduras, Guatemala, as well as the southern part of Mexico.[25] As pointed out above, in areas of the Dome that occurs within national jurisdiction, none of the coastal States have agreed maritime boundaries with adjacent or neighbouring States. This clearly presents a considerable legal dilemma in managing and conserving cross-boundary resources and the associated biodiversity in a sustainable manner.

The legal context is further compounded by the ambulatory nature of the CRD, which is influenced by coastal wind and currents.[26] That said, there is scientific support for the view that the CRD is permanent in the sense that "thermocline doming and associated cyclonic circulation are always present within the region, however, the Dome's location and magnitude vary considerably during the year."[27] Moreover, there are a number of scientific studies that explain the seasonal evolution of the Dome. Fiedler, for example, describes this seasonal evolution and shows its close association with the wind jets.[28] Kessler has documented the position and extent of the CRD changes from year to year,[29] and as can be seen from Figure 2, there is a close interaction between the winds and currents. Thus, the CRD is influenced by "the dipolar wind stress curl distribution created by the Papagayo Jet and the south trade winds."[30] In accordance with this analysis, the annual cycle of the Dome can be explained by four main stages of wind-ocean interaction, namely: a) Coastal shoaling of the thermocline off the Gulf

[22] Ibid.
[23] Fiedler, above n 4, 366.
[24] Ibid. 329.
[25] Ibid. 321.
[26] Jiménez, above n 7, 17.
[27] Fiedler, above n 4, 331.
[28] Ibid. 322
[29] W. S. Kessler (2006) 'The circulation of the Eastern Tropical Pacific: A review,' *Progress in Oceanography*, Vol. 69.
[30] C. L. Brenes, et al., (2008) 'Geostrophic circulation between the Costa Rica Dome and Central America,' *Deep-Sea Research Part I Oceanographic Research Papers*, Vol. 55(5), 2. See also Kessler, above n 29.

of Papagayo during February–April; b) Separation from the coast during May–June when the Inter-Tropical Convergence Zone (ITCZ) moves north; c) Countercurrent thermocline ridging during July–November; d) Deepening during December–January when the ITCZ moves south.[31]

In addition, wind jets have an intense cooling effect on the temperature of the upper layer of the Eastern Tropical Pacific. Consequently it impacts the distribution of biological components and nutrients including phytoplankton and zooplankton off the Pacific coast of Central America,[32] but also from the coastal areas to the High Seas, generating a direct connection between the ecosystems of both geographical areas.[33]

As mentioned above, the CRD is considered by the scientific community to be a permanent feature, but its location and magnitude vary throughout the year.[34] This of course has major implications for the design of any putative conservation regime that is aimed at managing human impacts on the unique biodiversity associated with the Dome, as will become evident in chapter 9. Furthermore, the cyclonic circulation surrounding the Dome also influence living organisms, such as larvae of near-shore species, which are transported from the coast of Central America to open waters.[35]Again, the ephemeral nature of the geographical distribution of such species varies from season to season and this also poses similar challenges in the risks posed by pollutants in the marine environment, which will also be amplified by the cyclonic circulation associated with the CRD.[36]

From an oceanographic perspective, the thermocline that gives the CRD its name is a subsurface vertical gradient in temperature and in water density, which acts as "an

[31] Fiedler, above n 4, 21.
[32] R. Aguirre-Gómez, O. Salmerón-García (2012) 'Satellite observations of the effect of ENSO on the Tehuantepec and Papagayo upwellings,' *Revista de Ciencia y Tecnología de América,* Vol. 37(11), 829.
[33] Jiménez, above n 7, 19.
[34] Fiedler, above n 4, 331.
[35] L. I. Vilchis (2010) *A retrospective study of ecosystem effects of the 1976/77 regime shift in the Eastern Pacific warm pool*. Unpublished Oceanography PhD thesis. University of California, San Diego, 30.
[36] J. A. Jiménez (2017) 'El Domo Térmico de Costa Rica: Una iniciativa Centroamericana para la conservación del Alta Mar.' *Taller Regional Centroamericano: Hacia un nuevo instrumento internacional para la conservación y uso sostenible de biodiversidad marina más allá de las jurisdicciones nacionales*. Costa Rica, 8-9 de Marzo.

effective physical and biological barrier in the ocean."[37] In the Eastern Tropical Pacific, the thermocline depth and strength are considered to be important oceanographic predictors of abundance and distribution for species, such as seabirds and cetaceans.[38] In the CRD, a pronounced thermocline dome develops throughout the year with colder temperatures at the 20°C isotherm and extending to a depth of 30 meters. Subsequently, sea surface temperature is 0.5°C lower over the CRD than the background temperatures of the surrounding sea areas,[39] turning out to be a cool nutrient-rich water within the less productive and warmer tropical surface water mass.[40]

As a result of its unique physical attributes as a seasonally predictable thermocline, there is a distinct biological habitat associated with the Dome, where phytoplankton and zooplankton biomass are higher than in surrounding tropical waters translating into higher productivity along peaks in zooplankton biomass.[41] The upwelling of cold waters full of nutrients generates special environmental conditions in the area, with surface waters higher in nitrates, richer in phosphates[42] and chlorophyll than surrounding areas, resulting in high levels of primary productivity.[43] This in turn supports a complex food web as well as economically important fish stocks and other species at higher trophic levels.[44]

2.4 COMMERCIAL, ECONOMIC AND SCIENTIFIC ACTIVITIES ASSOCIATED WITH THE CRD

The literature on the commercial, economic and scientific activities associated with the CRD is in its infancy despite the fact that the Dome provides valuable goods and ecological services to the coastal States within the Central American Region. That said,

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[37] Ballance, Pitman, Fiedler, above n 21, 367.
[38] Ibid.
[39] Xie, above n 5, 1.
[40] Vilchis, above n 35, 61. See also: Kessler, above n 29.
[41] M. A. Fernández-Álamo, J. Färber-Lorda (2006) 'Zooplankton and the oceanography of the Eastern Tropical Pacific: A review.' *Progress in Oceanography*, Vol. 69(2). See also: J. T. Pennington, et al., (2006) 'Primary productivity in the Eastern Tropical Pacific,' *Progress in Oceanography*, Vol. 69(2).
[42] W. W. Broenkow (1965) 'The distribution of nutrients in the Costa Rica Dome,' *Limnology and Oceanography*, Vol. 10(1).
[43] Fiedler, above n 4, 334.
[44] M. Alexander, H. Seo, S. P. Xie, J. D. Scott (2012) 'ENSO's Impact on the gap wind regions of the Eastern Tropical Pacific Ocean,' *Journal of Climate*, Vol. 25(10). See also: Pennington, above n 41.

a number of commercial activities pose a threat to the conservation of its unique marine biodiversity such as fisheries, marine tourism, commercial shipping, and potentially the development of seabed mining and scientific research. Each of these activities merit further consideration here.

2.4.1 Fisheries

The constant upwelling of nutrients within the Dome supports an abundance of fish and other forms of marine life.[45] As a result, fishing is one of the main economic activities in the CRD, where commercial fishing vessels capture tuna and other important species including squid, mahi-mahi and billfish, which provide a vital source of income and food for the Central American countries, as well as for distant fishing fleets from further afield.

In general, there is considerable scientific information in the public domain on the scale and intensity of fishing efforts in the Dome and the importance of fisheries to the economic well-being of the wider geographical region.[46] Thus, for example, fishing activities in Central America have been estimated to contribute at least USD$750 million annually to the economies within the region and supported the direct and indirect employment of 450,000 people.[47] This contribution cannot be attributed in its entirety to fisheries in the Dome, but extends much further afield to fisheries on all Central American coasts both east and west. The importance of the CRD should not be underestimated in so far as the FAO has pointed out that the associated area supports important pelagic fisheries, particularly of tunas and squids.[48] Moreover, Mexico and most countries in Central America have fleets both on the Pacific and Caribbean coasts, and they are highly dependent on coastal fisheries, especially as a source of jobs and food. Reports by FAO for these countries indicate that catches appear to be higher on the Pacific than on the Caribbean coast in most cases.[49]

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[45] Brenes, Lavín, Mascarenhas, above n 30, 2. See also: Fiedler, above n 4.
[46] Jiménez, above n 7, 76-82. See also: FAO. 2016. *The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all.* Rome, 42.
[47] Center for Ocean Solutions (2009). *Pacific Ocean Synthesis: Scientific Literature Review of coastal and ocean threats, impacts, and solutions*. The Woods Center for the Environment, Stanford University. California, 42.
[48] FAO, above n 46, 42.
[49] S. Salas, R. Chuenpagdee, A. Charles, J. C. Seijo (eds.), 'Coastal fisheries of Latin America and the Caribbean,' *FAO Fisheries and Aquaculture Technical Paper*. No. 544. Rome, FAO. 2011.

As mentioned above, a productive tuna fishery commenced in the CRD in the 1950s and this has since developed into a major global fishery.[50] Indeed today, the Eastern Tropical Pacific is considered to be "the second largest tuna fishing area in the world, and the birthplace of today´s modern tuna industry for yellowfin and skipjack."[51] Significantly, the data on the spatial pattern of tuna catches reflects a stock distribution and thermal preference for the warm water of the equatorial counter-current,[52] as can be seen from Figure 3.

From a fishery management viewpoint, it is important to note that the distant-water long-line fleets of China, Chinese Taipei, French Polynesia, Japan, the Republic of Korea, Spain, the United States and Vanuatu,[53] fish for tuna in the Eastern Pacific. According to the Inter-American Tropical Tuna Commission (hereafter, IATTC), the most common targeted fish are bigeye and yellowfin tunas.[54] Furthermore, only some of the Central American countries have industrial scale of tuna vessels exploiting the resource, namely: Nicaragua, El Salvador and Panama.[55] On the other hand, the increased demand in the international markets for fresh tuna since the mid-1990s has resulted in the progressive development of a long-line fisheries in Costa Rica, Nicaragua and Panama in both coastal and high seas regions.[56]

The second most important fishery within the CRD is the jumbo flying squid fishery, which is closely associated with the high chlorophyll concentrations found in the area.[57] The CRD is thought to be a hatchery zone for squid, which is targeted by vessels from Peru, Chile and Ecuador.[58] Moreover, the CRD provides unique environmental

[50] Fiedler, above n 4, 321. See also: Pennington, above n 41.
[51] P. Trutanich (2005) 'Eastern Tropical Pacific tuna fisheries,' *INFOFISH International*, Vol. (4), 68.
[52] J. A. Anda-Montañez, et al., (2002) 'Spatial Analysis of the yellowfin tuna (*Thunnus albacares*) fishery, and its relation to El Niño and La Niña events in the Tropical Eastern Pacific,' *Investigaciones marinas*, Vol. 30(1), 1.
[53] Inter-American Tropical Tuna Commission (2016) *Tunas, billfishes and other pelagic species in the Eastern Pacific Ocean*. Fishery Status Report No. 14, 9.
[54] Ibid. 6. See also: FAO, above n 46, 39.
[55] Inter-American Tropical Tuna Commission (2017) Vessel database: Active purse-seine vessels. Available at: https://www.iattc.org/VesselRegister/VesselList.aspx?List=AcPS&Lang=ENG
[56] Salas, Chuenpagdee, Charles, Seijo, above n 49. See also: Inter-American Tropical Tuna Commission (2017) Vessel database: Authorized large long-line vessels. Available at: https://www.iattc.org//VesselRegister/VesselList.aspx?List=Longline&Lang=ENG
[57] Jiménez, above n 7, 42.
[58] C. M. Waluda, P.G. Rodhouse (2006) 'Remotely sensed mesoscale oceanography of the Central Eastern Pacific and recruitment variability in *Dosidicus gigas*,' *Marine Ecology Progress Series* Vol. 310, 26.

benefits for what is considered to be the largest cephalopod fishery in the Eastern Pacific, with both commercial and artisanal fleets operating off the coasts of Peru, Mexico (Gulf of California), Central America and Chile.[59] The total catch of jumbo flying squid (*Dosidicus gigas*) from the East Pacific region was 58,000 tonnes in 2009,[60] and it is exported to European markets, mainly for Spain, Italy, France and Ireland, as well as for markets in Russia, China, Japan and Southeast Asia. There is also increasing demand for the species in North and South American markets.[61]

In parallel with the activities of the commercial sea fishing industry, sport fishing is a significant economic activity in the Central American Region. In particular, the Dome´s rich nutrient productive areas have contributed to the growth of multi-million dollar sports fishing industry in Costa Rica, Guatemala and Panama.[62] As noted in scientific literature, the billfish sport fisheries are mostly catch-and-release fisheries aimed at securing the long-range sustainability of these highly exploited resources.[63] Thus, conservation plays an important role in the development of this sector and this in turn has contributed a positive impact to the economies of the littoral countries. For example, sports fisheries generated approximately US$599.1 million in Costa Rica in 2008, while commercial fishing represented US$527.8 million of the GDP in that particular year. In this regard, sport fishing in Costa Rica accounted for about US$70 million more than commercial fishing.[64] In Panama, the sports fishing industry benefits associated with billfish were estimated to be valued at about US$170.4 million in 2013.[65]

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[59] Ibid. See also: T. Ichii, et. al., (2002) 'Occurrence of jumbo flying squid *Dosidicus gigas* aggregations associated with the countercurrent ridge off the Costa Rica Dome during 1997 El Niño and 1999 La Niña,' *Marine Ecology Progress Series* Vol. 231.
[60] FAO (2011) *Review of the state of world marine fishery resources*. Fisheries and Aquaculture Technical Paper No. 569, 177.
[61] M. Vierros, J. A. Jiménez, G. Shillinger, E. Hoyt (2014) *Protection and management of the Costa Rica Dome: An oceanic oasis for marine conservation and sustainable fisheries*. Costa Rica, MarViva Foundation, 22.
[62] Jiménez, above n 7, 76.
[63] N. Ehrhardt, M. Fitchett (2006) 'On the seasonal dynamic characteristics of the sailfish, *Istiophorus platypterus*, in the Eastern Pacific of Central America,' *Bulletin of Marine Science,* Vol. 79(3), 589.
[64] M. Soto Jiménez, et. al., (2010) *Un análisis de la contribución económica de la pesca deportiva y comercial a la economía de Costa Rica*. Costa Rica: Universidad de Costa Rica, 10.
[65] R. Southwick, N. Russell, R. Lachman, J. Dreyfus (2013) *Sport-fishing in Panama: Size, Economic Impacts and Market Potential*. United States of America: The Billfish Foundation, 4.

Finally, in light of the importance of fisheries to the economic well-being of the region, one must also highlight food security as an important element to be taken into consideration when proposing conservation measures for the CRD. Food safety remains a major concern facing the seafood industry at a global level and for the fragile local economies of coastal States in particular.[66] In the Central American region, the rates of annual consumption in each country show that a high percentage of protein comes from fish products. Significantly, the highest country rates of annual fish consumption per capita are Panama (13.01 kg) and Costa Rica (12.9 kg), followed by El Salvador (6.77 kg), Nicaragua (4.75 kg), Honduras (3.98 kg) and Guatemala (1.29 kg).[67] In the region, the overall consumption of fish products between 2000 and 2010 was approximately 9.1 kg per capita annually and the population potentially consuming was 33,312,510 persons.[68] Clearly, for these Central American countries, food security and the protection of fisheries are of fundamental importance and thus remain the principal objectives of foreign policy within the region. Furthermore, it should be borne in mind that the conservation and sustainable use of biodiversity in the CRD has important social implications and raises important issues of the obligations to implement the targets set down by the 2030 Sustainable Development Agenda, as well as the wider human rights issues associated with access to food resource, which go beyond the scope of this study.[69] In particular, attention needs to be drawn to Target 14. 4, which requires the effective regulation, harvesting and end of overfishing, illegal, unreported and unregulated fishing by 2020, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.[70]

2.4.2 Marine tourism and charismatic species

In view of the inter-connectivity of coastal and offshore marine ecosystems, the conservation and management of biodiversity in the CRD has a bearing on the

[66] FAO (2012) *The State of World Fisheries and Aquaculture 2012*. Rome, 157.
[67] FAO (2013) Fishery Statistical Collections: Consumption of Fish and Fishery Products in Central American countries. Available at: http://www.fao.org/fishery/statistics/global-consumption/en
[68] FAO (2014) *Contribución de la pesca y la acuicultura a la seguridad alimentaria y el ingreso familiar en Centroamérica*. Panama, xiii.
[69] On the wider issues of human rights and food security see: B. D. Ratner, B. Åsgård, E. H. Allison (2014) 'Fishing for justice: Human rights, development, and fisheries sector reform,' *Global Environmental Change*, Vol. 27.
[70] United Nations Sustainable Development Goals. Goal 14, Target 14. 4. Available at: https://sustainabledevelopment.un.org/sdg14

sustainability of tourism activities in coastal areas of the littoral States. In particular, turtle and cetacean watching are significant and growing tourism activities that contribute to local economies within the Central American region.[71] Although it is difficult to quantify the exact contribution of ecological services and economic value of charismatic species such as turtles, because of the complex ecological interactions between them and the marine ecosystems, WWF nonetheless have pointed out that:

> Marine turtle use and conservation generate revenue and create jobs in developing countries throughout the world. The non-consumptive use of marine turtles generates more revenue, has greater economic multiplying effects, greater potential for economic growth, creates more support for management, and generates proportionally more jobs, social development and employment opportunities for women than consumptive use.[72]

Most notably, the CRD and its surrounding area encompass an important migratory path for a population of endangered leatherback turtles nesting in Costa Rica.[73] Furthermore, from a conservation perspective, the species is classified as critically endangered and has been on the IUCN Red List of threatened Species since 2010.[74]

The economic data demonstrates the importance of this charismatic species to the Central American region. As far back as 1994, Gutic estimated that a third, or US$1,350,960, of the gross tourism revenue for the area adjacent to Las Baulas Marine National Park (Playa Grande, Costa Rica) was generated by the leatherback turtles and the natural resources of the estuary at the southern end of Playa Grande.[75] The leatherback population alone generated two thirds of that revenue, equivalent to US$900,460 in 1993, a contribution that could be much higher today. The important economic contribution at a local level can be gauged from the gross annual revenue to tourism operators, business owners and their employees in Las Baulas de Guanacaste

[71] Jiménez, above n 7, 87.
[72] S. Troëng, C. Drews (2004) *Money Talks: Economic Aspects of Marine Turtle Use and Conservation*, WWF - International, Gland, Switzerland.
[73] G. Shillinger, et. al., (2010) 'Identification of high-use interesting habitats for Eastern Pacific leatherback turtles: role of the environment and implications for conservation,' *Endangered Species Research*, Vol. 10, 219.
[74] IUCN (2016) *The IUCN Red List of Threatened Species. Version 2016-3*.
[75] J. Gutic (1993) *Economic valuation of the Las Baulas de Guanacaste National Park: evaluation of the benefits received by the local users of their natural resources*. Unpublished Master of Science thesis. University for Peace. San José, Costa Rica.

National Park, which is estimated at US$2,113,176.[76] It must be pointed out however, as Dr. Vierros has indicated, that there is a pressing need for improved and sustained management of Mesoamerican nesting beaches and their related habitats to ensure the long-term conservation of leatherback turtles.[77]

In addition, the Eastern Tropical Pacific supports a diverse and abundant community of cetaceans with a number of endemic species and sub-species around its unique oceanographic characteristics, particularly the thermal structure of the water column.[78] The physical features of the Dome are particularly significant for blue whales and short-beaked common dolphins.[79]

The distribution of blue whales in the Eastern Tropical Pacific has been analysed by Reilly and Thayer,[80] and one of the main findings of the study was that over 90 per cent of the sightings were made in two locations: along Baja California and in the vicinity of the CRD. Moreover, the CRD has a significant role in providing feeding, breeding and calving habitat for blue whales, which the study notes are "observed year-round near the Dome feeding on large standing stocks of euphausiids which indicates that the physical and biological characteristics of the region are an important habitat for these species."[81] Additionally, the significant presence of calves confirms the use of the CRD as a birthplace for this species, emphasizing even more its ecological value.[82] As it will be seen later in this chapter, the abundance of blue whales and other cetaceans should be taken in consideration in managing the risks posed by navigation, specifically ship strikes, and ocean noise.

Also, common dolphins feed on small pelagic fish and squid in upwelling-modified waters off Baja California, along the equator, and in the surrounding areas of the

[76] Troëng, Drews, above n 72.
[77] Vierros, Jiménez, Shillinger, Hoyt, above n 61, 18.
[78] Ballance, Pitman, Fiedler, above n 21, 362. See also: P. C. Fiedler, L. D. Talley (2006) 'Hydrography of the Eastern Tropical Pacific: a review,' *Progress in Oceanography*, Vol. 69.
[79] Ibid.
[80] S. B. Reilly, V. G. Thayer (1990) 'Blue whale (*Balaenoptera musculus*) distribution in the Eastern Tropical Pacific,' *Marine Mammal Science* 6(4).
[81] Fiedler, above n 4, 336.
[82] Jiménez, above n 7, 63.

CRD.[83] The short-beaked common dolphin is found in greater abundance in the surrounding waters of the Dome.[84]

As a result of these species migration patterns up to the coast of California and through the Central American Pacific, a popular and growing activity for coastal communities is cetacean watching, which generates income for local communities and has contributed to the establishment of marine protected areas within the region. For example, in Costa Rica, the direct income from whale watching in the Bahia Ballena community was US$755,520 in 2007, and during the same year in Bahia Drake, another community in the South Pacific coast, this activity generated US$600.000.[85] In Guatemala, coastal communities also benefit from this commercial activity, such as the Sipacate, Escuintla; Churirín, Suchitepequez y El Chico, Retalhuleu.[86]

In synthesis, the importance of cetaceans to the future growth of marine tourism can be estimated from the high number of vessels engaged in this activity, which has grown exponentially since the 1990s.[87] Dr. Jimenez notes that: "the Dome is a relevant habitat for species of touristic interest in the region, such as cetaceans, sharks, billfish and turtles."[88]

2.4.3 Commercial shipping

There is considerable evidence that the Dome is exposed to serious threats and pressures from a variety of anthropogenic impacts including those from commercial shipping, as indicated in a global analysis undertaken on human impacts on marine ecosystems.[89] This is mainly because the CRD is located adjacent to one of the busiest

[83] Fiedler, above n 4, 336.
[84] The Eastern Tropical Pacific is the only tropical ocean worldwide where four sub- species of spinner dolphin occur, two of which are endemic. Ballance, Pitman, Fiedler, above n 21, 367.
[85] J. Rodriguez, A. Fischel (2007) *Impacto socioeconómico del turismo de observación de cetáceos en Costa Rica (Periodo 2006/2007)*. Costa Rica: Fundación PROMAR, 23.
[86] J. Ortíz Wolford, et. al., (2012) *Cetáceos del Pacífico oeste de Guatemala, y su importancia en el desarrollo socio-económico y ambiental del Pacífico Guatemalteco*. Guatemala: Centro de Estudios Conservacionistas, Universidad de San Carlos de Guatemala, 10.
[87] E. Hoyt, M. Iñíguez (2008) *The State of Whale Watching in Latin America*, WDCS, Chippenham, UK; IFAW, East Falmouth, USA; and Global Ocean, London.
[88] Jiménez, above n 7, 87.
[89] B. Halpern, et. al., (2008) 'A Global Map of Human Impact on Marine Ecosystems,' *Science,* Vol. 319.

shipping lanes, where about 14,000 vessels carrying 5 per cent of the world's maritime cargo, approaches to and from the Panama Canal.[90]

A significant percentage of these routes cross the Dome region, with global maritime traffic increasing 300 per cent in the last 20 years.[91] The shipping industry presents a number of risks including collisions between ships and marine species that sometimes result in fatal injuries and amputations.[92] The blue whales, dolphins and other cetaceans tend to aggregate in large groups in the CRD to feed and breed.[93] Subsequently, they are especially vulnerable due to the considerable time they spend in the surface waters.[94] There is also the risk of marine pollution, noise, debris and navigation accidents.[95] Noise pollution from ships degrades the quality of the acoustic environment and impinges upon the range of low frequencies used by many cetacean species, affecting their capacity to effectively communicate.[96]

The generation of further detailed information on the scale of such risks and how to minimize the interaction of heavy traffic with the emblematic species in the CRD is considered further in chapter 9 of the present study. For example, marine spatial planning schemes could reduce the probabilities of collisions with cetaceans, as well as the establishment of regulations on travel speeds or even noise-free areas in the CRD.[97]

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[90] Comisión Centroamericana de Transporte Marítimo (2013) *Origen y destino de la carga en Centroamérica*. Nicaragua: COCATRAM. See also: E. Torres (2014) 'Centroamérica, el próximo nodo logístico mundial,' Forbes. 14 October. Available at: https://www.forbes.com.mx/centroamerica-el-proximo-nodo-logistico-mundial/

[91] J. Tournadre (2014) 'Anthropogenic pressure on the open ocean: The growth of ship traffic revealed by altimeter data analysis,' *Geophysical Research Letters*, Vol. 41(22).

[92] S. Panigada, et. al., (2006) 'Mediterranean fin whales at risk from fatal ship strikes,' *Marine Pollution Bulletin*, Vol. 52.

[93] E. Hoyt, M. Tetley (2011) 'The Costa Rica Dome: Building a case for place-based management of blue whales on the high seas,' *Second Conference on marine mammal protected areas*, Martinique 7-11 November.

[94] D. W. Laist, A. R. Knowlton, J. G. Mead, A. S. Collet, M. Podesta (2001) 'Collisions between ships and whales,' *Marine Mammal Science*, Vol. 17 (1). See also: Jiménez, above n 7, 73.

[95] A. Ameer, O. Linden (eds.), *Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures (*Malaga, Spain: IUCN Centre for Mediterranean Cooperation, 2008).

[96] Ibid. See also: C. W. Clark, et. al., (2009) 'Acoustic masking in marine ecosystems: intuitions, analysis, and implication,' *Marine Ecology Progress Series*, Vol. 395, and M. Castellote, C. W. Clark, M. O. Lammers (2010) *Potential negative effects in the reproduction and survival on fin whales (Balaenoptera physalus) by shipping and airgun noise, Report SC/62/E3*. United Kingdom: International Whaling Commission.

[97] Jiménez, above n 7, 73-74. For another example see also: NOAA (2011) *Regulations on Vessels Effects*. Available at: http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/killer_whale/vessel_regulations.html

Likewise, the Dome might be thought to be an ideal candidate for the designation of a Particularly Sensitive Sea Area by the IMO, an area-based management tool (ABMT, hereafter) to be established in an area with recognized ecological, socio-economic, or scientific attributes, due to its need for special protection through IMO actions.[98]

2.4.4 Seabed minerals

Marine minerals are found in all the world's oceans. These deposits may be many times richer than land-based deposits and contain many years supply of key strategic metals such as copper, cobalt, nickel and manganese. However, at the time of writing, there is no scientific and technical literature indicating precisely the quantities and distribution of minerals of commercial interest in the international seabed area of the CRD.[99] As will be seen later, the International Seabed Authority (hereafter, ISA) is the competent international body with responsibility for the exploitation of the seabed mineral resources under the CRD in ABNJ.[100] Written communication by the author of this study with the Legal Counsel and Deputy to the Secretary-General,[101] as well as with the Office of Environmental Management and Mineral Resources, indicates that the seabed of the CRD ABNJ region remains largely unexplored and no exploration contracts have been issued by the ISA for this purpose to date. Indeed, the nearest exploration contracts apply in the Clarion-Clipperton Fracture Zone of the North Central Pacific. On the other hand, there are concentrations of minerals such as copper, nickel and cobalt in the Easter Pacific Ocean and most notably in Mexico's EEZ, [102] the latter have been subject to protracted dispute due to the adverse impacts of mining activities on the migratory routes of loggerhead turtles and impacts on their marine habitats.[103] The potential risks posed by mining of the seabed of the CRD in ABNJ are therefore discussed further below.

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[98] International Maritime Organisation, Resolution A.982 (24), 3. Further details on the PSSA regime are addressed in Chapter 4 of this study.
[99] M. Rodriguez (2017) Email to International Seabed Authority officers, 8 April.
[100] See Chapter 4.
[101] M. Rodriguez (2017) Email to International Seabed Authority officers, 8 April.
[102] A. M. Post, *Deepsea Mining and the Law of the Sea* (The Hague: Nijhoff, 1983), 11-17.
[103] Interamerican Convention on the Protection and Conservation of Sea Turtles, Resolution CIT-COP7-2015-R3. Recital 2. See also: S. Mehta (2016) 'Victory: Mexico Seabed Mining Project Scrapped,' Earthworks. 13th May. Available at: https://www.earthworksaction.org/earthblog/detail/victory_mexico_seabed_mining_project_scrapped#.WRscllLMz3A

2.4.5 Marine scientific research and bioprospection

As will be seen later in this study, marine scientific research is a high seas freedom and all States have the right to undertake research in the ABNJ part of the CRD in conformity with Part XIII of UNCLOS.[104] This is crucially significant as the information and data derived from marine scientific research are the very foundation of good decisions in ocean governance. Research in such instances may be both pure and applied. This is particularly the case in relation to the CRD, as there are many unanswered questions about the extent of the biodiversity in the region and their related processes, as well as the actual and potential benefits that may be derived therefrom. This view is supported by most recent publication on the CRD, which notes that one of the principal challenges is the fragmented and incomplete information about the oceanographic and ecosystem features associated with the Dome.[105] That said, there have been a number of attempts to close the information deficit. Indeed, as pointed out above, the first CRD scientific expedition by the Scripps Tuna Oceanography Research program took place in 1959. A second expedition programme organized by the Mexican DOMO, which undertook extensive surveys during 1979–1982, applied sampling efforts in repeated surveys of the CRD.[106] Most recently, a smaller expedition took place in March 2017 organized by MarViva Foundation, the Global Ocean Biodiversity Initiative (GOBI) and Mission Blue, with the view to raise awareness on the importance of the CRD and build up information on some of the species associated with the Dome. Two of the research activities accomplished during this expedition were the tagging of turtles and sharks with satellite transmitters to increase data on migratory paths, and the study of the composition of the cold upwellings at the Dome by sampling the water to geo-locate zooplankton and phytoplankton profiles.[107] It is also evident that there have been numerous research cruises to the region if one examines the NOAA's National Centres of Environmental Information website, which has several databases including bathymetric and oceanographic data.[108] The author of this study also noted that there is additional

[104] See Chapter 3.
[105] Jiménez, above n 7, 89.
[106] Fiedler, above n 4, 321.
[107] D. Castellana (2017) 'Costa Rica Thermal Dome Expedition: Scientific research on the high seas,' *Mission Blue*, 10th April. Available at: https://www.mission-blue.org/2017/04/costa-rica-thermal-dome-expedition-hard-science-on-the-high-seas/
[108] National Oceanic and Atmospheric Administration. National Centres of Environmental Information. Available at: https://www.ncei.noaa.gov

information available on the OBIS database about scientific activity in the region.[109] Indeed, a brief glance reveals that there is a broad range of entities involved in undertaking research in the region including marine scientists on government sponsored programmes by NOAA and IFREMER and others, as well as geoscience expeditions studying the geomorphology of the ocean floor and related features. In addition, the Costa Rican margin is of interest to a number of international research groups, which have pointed out that the understudied hydrothermal seeps are an unusual location where warm hydrothermal venting and methane seeps coincide and support diverse chemosynthetic communities.[110] As noted in one research proposal, "more complete quantitative sampling and genetic identifications are necessary to truly understand their placement in the global biogeographic context and the relative uniqueness [of the Costa Rican margin] system."[111] The latter proposal is significant because marine genetic resources are one of the subjects addressed in the negotiations of a new agreement for ABNJ, as will be seen in chapter 8.

In light of the lack of baseline information on the CRD environment and its associated biodiversity, it is crucial to encourage further research in this area. It is significant that there is no hub for this type of information, similar to the one that exists in the Eastern Caribbean States.[112] There is also a major deficit regarding any research that has been undertaken for commercial purposes in the CRD including any research on marine genetic resources or the biological communities associated with the unique and dynamic ecosystem associated with this oceanographic feature. This is one of the tasks that could be taken on by a clearinghouse under the new BBNJ Implementation Agreement, as will be articulated further in chapter 9. In this regard, consideration should also be given to minimising the risks posed by scientific investigation, particularly in the form of bioprospection. The author will return to this topic in greater detail later in this study. Instructively, the most recent MarViva publication on the CRD notes that there is a pressing need to improve scientific understanding of the ecological processes and the resources they support by the production of synoptic charts and

[109] UNESCO- Intergovernmental Oceanographic Commission. Ocean Biogeographic Information System (OBIS). Available at: http://www.iobis.org/mapper/
[110] See E. Cordes (2014) 'Costa Rican Margin,' *Workshop on telepresence-enabled exploration of the Eastern Pacific Ocean*. California, 11-13 December.
[111] Ibid. 155.
[112] Organisation of Eastern Caribbean States. Public Resources Center. Available at: http://www.oecs.org/public-resources-centre/oecs-library

technical reports.[113] The case is a compelling one as systemised and comprehensive scientific information can inform the planning and management of the region. Jimenez, Pendleton and others, have noted that it is "imperative to quantify and analyse provisioning (such as fishing), regulatory (such as its effect on climate), and ecosystem (such as productivity and nutrient cycle role) services to understand the full value of the Dome for the region."[114] There are other considerations that need to be taken into account including capacity building and technology transfer to countries within the region with a view to building expertise and benefit sharing. Again, the latter topic is addressed in some detail in chapter 9.

2.5 RISKS TO CONSERVATION AND MANAGEMENT CHALLENGES

From the above description, it is evident that the CRD faces a number of pressing anthropogenic risks to conservation, as well as a several challenges with regard to the management of commercial and related activities. In addition, the Central American region is vulnerable to the effects of climate change. A number of specific risks and challenges are explored further below.

2.5.1 Unsustainable fisheries and IUU fishing

First and foremost, the principal threat to the long-term sustainability of the unique biodiversity of the Dome is the threat posed by overfishing of commercially important species in the CRD. Again much of the specialist literature is unequivocal on this point. For instance, the Woods Center for the Environment at Stanford University have identified that commercial and industrial fishing are major threats in the North East Pacific as this region is extremely productive and supports economically valuable fisheries and aquaculture activities.[115] Ominously, they have concluded that "fisheries management in Central America is generally failing to control illegal fishing, and the depletion of fish stocks has a direct impact on coastal populations in that it reduces income and increases unemployment, thus weakening social stability and food

[113] Jiménez, above n 7, 90.
[114] L. Pendleton, F. Krowicki, P. Strosser, J. Hallett-Murdoch (2014) *The value of marine and coastal ecosystem services in the Sargasso Sea, Working Paper EE 14*. North Carolina: Duke University. See also: Jiménez, above n 7, 90.
[115] Center for Ocean Solutions, above n 47, 37.

security."[116] Accordingly, overexploitation is a persistent threat to fisheries carried out in the CRD. Moreover, currently, it is not known exactly how many vessels operate in the CRD, nor is there a complete record of vessels that regularly fish in the area.[117] What is more, the scientific picture is pretty grim with respect to yellowfin tuna, with the IATTC estimating that "during 2004-2009 the catch decreased substantially, and the catch during 2012 was comparable to the lowest catches of the 2006-2008 period."[118] The FAO highlighted that skipjack tuna are fully fished in the Eastern Pacific in 2016.[119] Yellowfin tuna catches in the Eastern Tropical Pacific peaked in 2002 with a reported catch of 443,458 tons and has since decreased to about 223,000 tons in 2013.[120]

In relation to mahi-mahi, "the fishing capacity of artisanal and semi-industrial fleets has grown considerably without adequate control by local Governments. As a result, mahi-mahi landings in Costa Rica declined at an average rate of 300 tons per year during 2001–2004 and the Nicaraguan fishery followed a similar declining trend. These trends may be due to the fishing overcapacity of the fleet."[121]

Another major threat posed by industrial and semi-industrial fisheries in the CRD is the unintended by-catch of leatherbacks, other marine turtles and cetaceans. The scale of this risk may be appreciated when it is considered that fisheries by-catch is cited as one of the main reasons for the more than 90 per cent decline in leatherback turtle nesting populations in the Eastern Pacific.[122] For example, despite the establishment of domestic conservation measures within jurisdictional waters and the improvement on the management of nesting beaches in Costa Rica, sea turtles are still under threat since they spend a significant part of their lives in ABNJ, where limited protection currently

[116] Ibid. 38
[117] P. Cubero Pardo, D. A. Martínez Cascante (2013) *Análisis de la pesquería de atún en la zona económica exclusiva del Pacífico de Costa Rica*. Costa Rica: FECOP.
[118] Inter-American Tropical Tuna Commission (2012) *Tunas and billfishes in the Eastern Pacific Ocean in 2012*, 2.
[119] FAO, above n 46, 39.
[120] Inter-American Tropical Tuna Commission (2014) *Tunas and billfishes in the Eastern Pacific Ocean. Fishery Status Report No. 12*, 32.
[121] Ehrhardt, Fitchett, above n 63.
[122] "Conservative estimates are that longline and gill-net fisheries killed at least 1,500 female leatherbacks per year in the Pacific during the 1990s. With a population of about 6,500 adult females, this corresponds to a 23% annual mortality, or 33% if most leatherbacks captured came from the East Pacific population." J. R. Spotila, et. al., (2000) 'Pacific leatherback turtles face extinction,' *Nature*, Vol. 405. See also: Inter-American Tropical Tuna Commission, above n 120, 135.

exists and a latent danger of ending up as by-catch in longline fisheries is a reality.[123] Furthermore, there is vital land-sea interface in so far as the decline in leatherback turtles seen on nesting beaches[124] will also have significant economic consequences for places like Playa Grande (Costa Rica) in terms of lost eco-tourism revenue. Therefore, there is an urgent need for the improvement of management and conservation measures in nesting beaches, in parallel with the implementation of flexible and dynamic adaptive management strategies, and intergovernmental cooperation in marine conservation strategies in ABNJ.[125]

Illegal, unreported and unregulated fishing (IUU fishing) is a major concern in the Eastern Tropical Pacific. Many countries in Latin America, including the Central American region, lack the necessary resources to carry out the recommendations made by international organisations, such as the FAO, on how to curtail such practice. The main drivers of IUU fishing in the region are the lack of adequate management of fisheries and excess of fishing capacity; the lack of capacity to efficiently implement fisheries management and protection measures; loopholes in fisheries laws and regulations; inefficient use of technology; low level of participation by the countries in binding international agreements to combat IUU fishing; limited availability of resources for monitoring, control and surveillance.[126] There is also a high degree of uncertainty about the real magnitude of IUU fishing in the CRD and its economic, social and environmental impacts.

Nevertheless, there has been some progress in addressing this problem with, several Central American countries improving regulations to prevent and deter IUU fishing, as it will be seen in further detail in chapter 5. Most recently, a regional project under the name 'Pescapuertos' includes the active involvement of Ministers and Fisheries Directors from eight countries of the Central American Integrated System, who have

[123] S. Kelly, et. al., (2016) 'Nesting population origins of leatherback turtles caught as by-catch in the U.S. pelagic long-line fishery,' *Ecosphere*, Vol. 7(3). See also: J. Roe, et. al., (2014) 'Predicting bycatch hotspots for endangered leatherback turtles on longlines in the Pacific Ocean,' *Proceedings of the Royal Society Biological Sciences*, 281.
[124] "From 1993–94 to 1998–99, the annual mortality for Playa Grande leatherbacks that nested in 1993–94 was 34.6%, and for those that nested in 1994–95 it was 34.0%. Most of the mortality at Playa Grande was probably caused by fisheries." Spotila, above n 122.
[125] E. Willis-Norton, et. al., (2014) 'Climate change impacts on leatherback turtle pelagic habitat in the Southeast Pacific,' *Deep-Sea Research II Topical Studies in Oceanography*, 15.
[126] Organización Latinoamericana de Desarrollo Pesquero (2011) *Evaluación de las estrategias aplicadas por los países de la Región para la lucha contra la pesca ilegal, no declarada y no reglamentada*. Peru: OLDEPESCA, 28.

agreed to cooperate in the enhancement of Port standards in accomplishing the Port State Measures Agreement provisions. Some of the actions that will be developed under the regional project are: the harmonization of standards on Port State measures applicable to fishing vessels, improved training for fishing inspectors at ports, sharing of information on suspicious fishing activities, and improvement on coordination among fisheries and maritime authorities.[127]

2.5.2 Pollution

The second major threat to biodiversity is the threat posed by pollution from both marine and land-based sources. The Woods Center for the Environment has summarized the overall situation in Central America as follows:

> Impact forms of pollution in the Region include oil spills, antifouling chemicals and solid waste disposal. Such pollution can create dead zones and algal blooms, alter the ecosystem structure, and jeopardize human systems. Agriculture, wastewater, and other sources contribute to the pollution problem, which is exacerbated by the lack of infrastructure in parts of Central America. Except in Costa Rica, there is a low level of sanitation coverage, so nutrient pollution from human sewage remains a prevalent threat in many Central American countries. Throughout the region, no matter the source, nutrient pollution may result in adverse impacts on the marine environment.[128]

In relation to noise pollution, and as seen in subsection 4.3 of this chapter, there is support in the scientific literature that noise pollution from commercial shipping may lead to displacement, behavioural disturbance[129] and interference with communication pathways[130] of cetaceans.

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[127] T. Long (2017) '8-Country commitment shows Central America is serious about ending illegal fishing,' *The Pew Charitable Trust, Compass Points Blog*, 15 February. Available at: http://www.pewtrusts.org/en/research-and-analysis/blogs/compass-points/2017/02/15/8-country-commitment-shows-central-america-is-serious-about-ending-illegal-fishing. See also: Secretaría de Agricultura y Ganadería de la República de Honduras (2016) 'Delegados de Pesca de Centroamérica conocen Acuerdo para eliminar la pesca illegal,' 6 Abril. Available at: http://www.sag.gob.hn/sala-de-prensa/noticias/ano-2016/abril-2016/delegados-de-pesca-de-ca-conocen-acuerdo-para-eliminar-la-pesca-ilegal/

[128] Center for Ocean Solutions, above n 47, 34.

[129] W. J. Richardson, C. R. Greene, C. I. Malme, D. H. Thomson (eds.), *Marine Mammals and Noise* (San Diego, California: Academic Press, 1995).

[130] Vierros, Jiménez, Shillinger, Hoyt, above n 61, 24.

Finally, similar to other ocean regions, marine debris poses a risk to the quality of the marine environment in the CRD. In this regard, plastic pollution in particular is a pressing challenge as it is globally distributed across all oceans due to its properties of buoyancy and durability,[131] and usually converges in gyres, including it must be assumed, in the CRD.[132] Alarming data arises as research intensifies on this particular topic. Specifically for the Eastern Pacific Ocean (17.4°S to 61.0°N; 85.0 to 180.0°W), it has been estimated that there is a minimum of 21,290 tons of floating microplastic, on the basis of data collected in this ocean region since 1999.[133] The ingestion of plastics by marine life, and its subsequent introduction into the food web, as well as the degradation of ecosystems are well documented.[134] Leatherback turtles are particularly susceptible to ingesting plastic due to its similarity to their preferred food, jellyfish, as evidenced by the examination of the results of 371 necropsies, which were undertaken by Dalhousie University on this endangered species worldwide.[135] Therefore, key actions to prevent and mitigate this enormous challenge must be addressed immediately. At the time of writing there is no specific information on the precise distribution of plastics in the CRD, but the existing data on the Eastern Pacific Ocean could be extrapolated and it could be inferred that this unique marine environment is not excluded from the plastics epidemic. Indeed, a study by GESAMP on microplastics supports this view. [136]

2.5.3 Exploration and exploitation of mineral resources of the Area

[131] M. Eriksen, et. al., (2014) 'Plastic pollution in the World's Oceans: More than 5 trillion plastic pieces weighing over 250,000 tons afloat at sea,' *PLoS ONE*, Vol. 9(12), 2. See also: L. Spear, D. Ainley, C. Ribic (1995) 'Incidence of plastic in seabirds from the Tropical Pacific, 1984–1991: Relation with distribution of species, sex, age, season, year and body weight,' *Marine Environmental Research*, Vol. 40(2).

[132] K. Law, et. al., (2010) 'Plastic accumulation in the North Atlantic Subtropical Gyre,' *Science*, Vol. 329.

[133] K. Law, et. al., (2014) 'Distribution of surface plastic debris in the Eastern Pacific Ocean from an 11-year dataset,' *Environ. Sci. Technol.,* Vol. 48, 4732.

[134] M. Gregory (2009) 'Environmental implications of plastic debris in marine settings-entanglement, ingestion, smothering, hangers-on, hitch-hiking and alien invasions,' *Philos Trans. R. Soc. Lond. B Biol. Sci.,* Vol. 364. See also: O. Seta¨la¨, V. Fleming-Lehtinen, M. Lehtiniemi (2014) 'Ingestion and transfer of microplastics in the planktonic food web,' *Environ. Pollut.,* Vol. 185.

[135] N. Mrosovsky, et. al., (2009) 'Leatherback turtles: The menace of plastic,' *Marine Pollution Bulletin*, Vol. 58(2), 287.

[136] GESAMP, 'Sources, Fate and Effects of Microplastics in the Marine Environment: Part 2 of a Global Assessment' (London: IMO, 2015), expands on an earlier study published in 2015.

The exploration and exploitation of mineral resources of the Area presents both a direct and indirect risk to the conservation of biodiversity. Exploration activities are underway in the Central Pacific. There are concerns about the effects of mining in areas that are adjacent and connected by ocean currents with biological hot spots because of the impacts of plumes of dust from mining activities and their subsequent spreading for long distances and smothering all life wherever they settle.[137] This of course is a much broader issue than concerns seabed mining more generally irrespective of where it is undertaken, and calls for the application of the precautionary approach until further scientific studies have been undertaken. Furthermore, as will be seen later in this study, although the seabed mining exploitation code and the environmental impact assessment for commercial exploitation have yet to be determined, the International Seabed Authority has adopted a regional ecosystem-based management approach to activities in the Clarion-Clipperton Zone. The risks posed by seabed mining should not be underestimated and resulted in the cancellation of a mining project in the EEZ of Mexico in 2016, as the Secretary of Environment and Natural Resources of Mexico refused development consent to the Don Diego marine phosphate mine project proposed for the Ulloa Bay in Baja California Sur. There were a number of reasons for this decision including the inconsistent information presented by the company for protecting the endangered loggerhead turtle, and to further comply with Mexico's obligations to protect its marine environment and the application of best available scientific information in the protection of such species.[138]

In general, there appears to be a major information deficit about the scope of impacts for mining activities. In marked contrast, the World Bank has also published a major report on seabed mining in the Western Pacific, but nothing similar has been completed in terms of scientific or technical studies for the Eastern Central Pacific or in

[137] See: D. Schuckman (2017) 'Renewables' deep-sea mining conundrum,' BBC Science, 11th April. Available at: http://www.bbc.com/news/science-environment-39347620?S

[138] See also: Interamerican Association for Environmental Defense (2015) *Comments of international law on the environmental impact of the Don Diego Project on marine dredging for the extraction of phosphate sands*. Available at: http://www.aida-americas.org/sites/default/files/press_releases/comentarios_a_la_mia_del_proyecto_don_diego.pdf, and S. Moguel (2016) 'Mexico protects loggerhead turtles from the Don Diego Mine,' *AIDA*, 25th April. Available at: http://www.aida-americas.org/release/mexico-protects-loggerhead-turtles-don-diego-mine

relation to the CRD more specifically.[139] As will be seen in chapters 4 and 9, exploration of the ABNJ of the CRD for seabed minerals is an issue regulated by the ISA. Clearly, at the time of writing, the exploration of the seabed of the CRD for commercial mining purposes is someway off and appears to be a relatively remote possibility based upon existing information. However, mining exploration and exploitation activities remain a potential risk and will require close collaboration and coordination with any future institutional bodies established pursuant to regional biodiversity agreement applicable to the CRD, as will become evident in chapter 9. At the very least, the potential risks of mining ought to be taken into consideration in any future management scheme, as the range and diversity of species found in association with mineral deposits in the deep seabed are poorly understood from scientific perspectives. Should interest increase in seabed mining in the CRD, consideration ought also to be given to designating the entire area, on a provisional basis, as an area of particular environmental interest (hereafter, APEI), similar to the designation that have been undertaken in the Clarion-Clippperton Zone.[140] This in turn would ensure the adoption and implementation of a comprehensive environmental management plan to protect the marine environment of the CRD from harmful effects that may arise from exploration and exploitation activities in the Area.[141] Again, we will return to this topic in chapter 9.

2.5.4 Effects of climate change

Research undertaken during the last decades has confirmed the importance of ocean biology in controlling the carbon dioxide content of the atmosphere.[142] Current estimations about carbon sequestration[143] by oceans indicate that approximately 25 per

[139] World Bank (2017) *Precautionary Management of Deep Sea Mining potential in Pacific Island countries*. Available at: http://pubdocs.worldbank.org/en/125321460949939983/Pacific-Possible-Deep-Sea-Mining.pdf
[140] See Chapter 3.
[141] International Seabed Authority, Decision ISBA/18/C/22. See also: International Seabed Authority, Decision ISBA/19/C/17 Section V.31.6, and K. Gjerde (2016) 'Beyond the Horizon: Overview of current environmental governance in marine areas beyond national jurisdiction,' *Informal meeting to consider the environmental elements of a new international instrument for the conservation and sustainable use of marine biodiversity beyond national jurisdiction*. Costa Rica, 16-18 February.
[142] A. Oka, et. al., (2011) 'Role of the ocean in controlling atmospheric CO2 concentration in the course of global glaciations,' *Climate Dynamics*, Vol. 37, 1755.
[143] M. Summer, L. Ballance, T. Groves (2016) 'An ecosystem services perspective for the oceanic Eastern Tropical Pacific: Commercial fisheries, carbon storage, recreational fishing, and biodiversity,' *Frontiers in Marine Science*, Vol. 3.

cent become bound into the seas and oceans.[144] Crucially, all of the aforementioned impacts on the CRD[145] highlighted in this chapter are compounded by the effects of climate change, which are altering physical oceanographic processes and/or the migration and distribution patterns of species utilizing the area.[146] Even though there is little understanding on the current and future impacts of climate change and ocean acidification in the Dome region, it is estimated that in general they will have consequences on its oceanographic singularity (marine upwelling), affecting consequently the species that depend on it, and the regional fishery and tourism industries that benefit from the CRD.[147]

In the overall threat that climate change represents to biodiversity, it also poses specific risks to particular species, such as the leatherback turtles,[148] as it is expected that ocean current behavior patterns will alter due to this global phenomenon.[149] Moreover,

> As equatorial currents change and strengthen, leatherback migration patterns may be impacted and potentially constrain turtles to increase swimming speed, expending additional energy, to reach their foraging grounds (…), changes in currents may also affect the distribution and abundance of leatherback prey and therefore leatherback foraging behavior, as gelatinous zooplankton are also influenced by oceanographic parameters and may respond to climate shifts.[150]

Additional threats to this species are habitat loss and their low resistance to stressful conditions, and consequently, "behavioral and physiological adaptation may be difficult for the Eastern Pacific leatherback turtle populations."[151]

Another climate and physical phenomenon that must be taken in consideration are the effects of El Niño and La Niña, large oceanic anomalies that occur from time to time off

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[144] C. Heinze, et. al., (2015) 'The ocean carbon sink - impacts, vulnerabilities and challenges,' *Earth Syst. Dynam*., Vol.6, 327.
[145] Jiménez, above n 7, 83.
[146] Vierros, Jiménez, Shillinger, Hoyt, above n 61, 30.
[147] Jiménez, above n 7, 83.
[148] Willis-Norton, above n 125.
[149] See: O. Hoegh-Guldberg, J. F. Bruno (2010) 'The impact of climate change on the World's marine ecosystems,' *Science*, Vol. 28, 1523.
[150] Willis-Norton, above n 125, 12-13.
[151] Willis-Norton, above n 125, 14.

the coast of South America, linked to the general weakening of the circulation of the southern hemisphere trade winds.[152] El Niño phenomenon occurs with different intensities and its duration is variable. It temporarily alters ocean conditions and climate of the coast, with an enormous impact on fisheries, agriculture and climate.[153] The weakening of the tropical trade winds reduces the upwelling and raises ocean temperature by approximately 5 Celsius degrees, that is why during an El Niño event, the surface waters in the Central and Eastern Pacific Ocean become significantly warmer than usual, and these anomalously warm waters in the surface ocean layers produce changes in the regional conditions.[154] Notably, it has been observed that during La Niña events, conditions for upwelling events were re-established.[155]

Moreover, it has been identified that "regional environmental changes caused by the variations of the physical parameters during El Niño years can modify the biological processes in the surface layers of the area."[156] For example, the yellowfin tuna fishery of the Eastern Pacific is reported to diminish significantly during these events,[157]and tuna catches have been affected by major El Niño events that occurred during 1982-1983 and 1997-1998.[158] Also, oceanographic variations associated with these phenomena is expect to be reflected by changes in cetacean's distribution or reproductive output.[159]

Impacts linked to the El Niño on other species have been reported, for example strong changes in the copepod community (plankton) of the Eastern Tropical Pacific during the 1982-1983 El Niño.[160] There appears to be a number of gaps in the scientific literature and in light of its high productivity, the CRD merits a more detailed study of its zooplankton communities, particularly regarding the primary productivity and the

[152] P. Bernal, F. Robles, O. Rojas (1990) 'Variabilidad física y biológica de la región meridional del sistema de corrientes Chile-Perú,' *Monografías Biol*ógicas, Pontificia Universidad Católica de Chile. Vol. 2.
[153] Ibid.
[154] Aguirre-Gómez, Salmerón-García, above n 32, 829.
[155] Ibid. 828.
[156] Ibid. 831.
[157] Anda-Montañez, above n 52, 5.
[158] Inter-American Tropical Tuna Commission (2013) *Tunas, billfishes and other pelagic species in the Eastern Pacific Ocean*, Fishery Status Report No. 11, 8, 15.
[159] Ballance, Pitman, Fiedler, above n 21, 362.
[160] A. Dossier, J. R. Donguy (1987) 'Modification of copepod population in relation to physical properties during the 1982-83 El Niño,' *AGU-IOC-WMO-CPPS Chapman Conference: An international symposium on "El Niño."* Ecuador, 27-31 October, 64.

seasonal changes of the upwelling and its effect on the upper trophic levels, mainly because it is economically important for the Central American region.[161]

An ancillary potential risk to the CRD is the threat of geoengineering experiments in the Eastern Pacific Ocean with a view to testing new scientific techniques that are aimed at mitigating the effects of climate change, particularly the form of ocean fertilisation.[162] Although the 2013 Amendment to the London Protocol regulates this particular issue, this amendment has not come into force and has only been signed by one Party.[163] The absence of effective multilateral measures to address this risk supports the view that there is the need for more specific regional rules addressing matters such as Environmental Impact Assessments, as well as a regional moratorium implementing the global prohibition.

2.6 APPRAISAL OF THE JURIDICAL, GEOGRAPHICAL, ENVIRONMENTAL AND SOCIO-ECONOMIC CONSIDERATIONS APPLICABLE TO THE CRD

Effective regulation and good governance of the marine environment is founded on the results of marine scientific research and in striking an appropriate balance between competing interests. In this context, it is evident that the CRD has unique juridical, geographical, environmental and socio-economic features. Winds and currents delineate the CRD, being a geographically mobile area, mainly located in areas beyond national jurisdiction, but which also straddles periodically the jurisdictional waters of five Central American countries including Costa Rica. The CRD is a high productivity area, which supports many component parts of marine biodiversity including marine mammals, seabirds and marine predators, several of which are classified as endangered and vulnerable species under the CMS and CITES. The Dome region also supports important pelagic fisheries, particularly tunas, billfish and squid, thus constituting a significant environment for important global fisheries and a source of food security.

[161] M. Suárez, S. R. Gasca (1989) 'Epiplanktonic calanoid copepods from the Costa Rica Dome (July- August, 1982),' *Ciencias Marinas*, Vol. 15(1). See also: Jiménez, above n 7, 85.
[162] National University of Singapore Centre for International Law (2017) 'New Activity: Geoengineering,' *International Conference on High Seas Governance: Gaps and Challenges*. Singapore, 24-25 April, 12-13.
[163] Ibid. 13.

Tourism revenue contributes meaningfully to the economy of the Central American Region. Whale and turtle watching especially support local communities in the coastal areas of Central America, contributing to rural economic development. Also, sport fishing of billfish, which benefit from the Dome´s rich nutrient areas, has been continuously emerging as a significant economic activity in these countries.

Nevertheless, the CRD is exposed to serious threats and pressures from a variety of anthropogenic impacts. Pointedly, the principal threats are from shipping traffic (noise pollution, collision risk to cetaceans), overfishing (depletion of fish stocks, reducing income and increasing unemployment) and IUU fishing, pollution from marine and land-based sources (agriculture, wastewater), climate change (alteration of physical oceanographic processes, ocean acidification and modification in the distribution patterns of species).

From the aforementioned analysis, it is evident that the CRD is similar to many other open ocean biodiversity hot spots in so far as there is a "lack of baseline information, limited understanding of vulnerabilities of species, habitats and ecosystems, challenges in monitoring and enforcement and significant gaps in capacity."[164] Furthermore, although the Central American countries have ratified many international Agreements that are applicable to fisheries management, marine conservation and maritime transportation, the regulatory framework remains highly fragmented as will be seen in chapters 3 and 4. In the main, however, it is evident from the brief description presented above that the reasons for valuing nature conservation in the CRD are supported by scientific evidence and are based upon utilitarian and anthropocentric considerations.

2.7 CONCLUSIONS

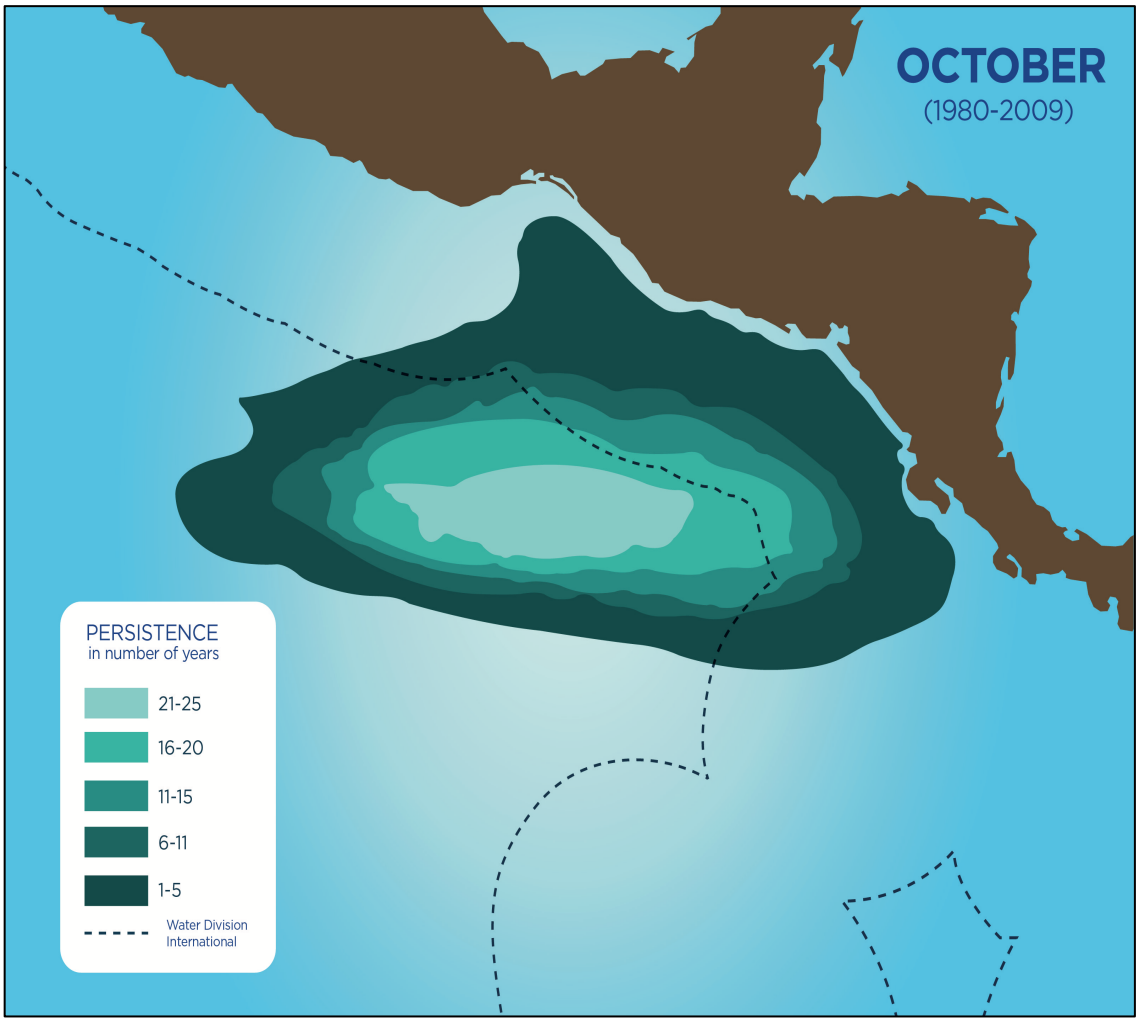
The CRD is a unique oceanographic feature in the Eastern Tropical Pacific that provides valuable ecological services and socio-economic benefits to Central American countries. There is increasing international awareness of this unique marine environment associated with the Papagayo upwelling system and adjacent areas EBSA.

[164] J. Appiott (2017) Unpublished paper. Presentation by the CBD Secretariat at the ATLAS side event. Third Session of the BBNJ Preparatory Committee. March 26 – April 7, United Nations Headquarters.

Additionally, the CRD has been identified as an example of outstanding universal value in ABNJ within the World Heritage Convention framework. So far, these two examples demonstrate that internationally, the CRD has already started climbing steps into its recognition as an area in which robust conservation measures must be placed. Nonetheless, it is evident from the discussion above that it requires urgent conservation measures because it is threatened by multiple anthropogenic activities. There is also a pressing need for proactive leadership and shared responsibility in environmental matters at regional and national levels to ensure the long-term sustainability of the CRD. Moreover, the lack of solid scientific information on the marine resources and biodiversity in the CRD hinders its conservation, therefore it is crucial to build up a robust baseline of data to inform and guide decision-making processes, and to enhance protection and management measures to ensure the conservation of the CRD. The latter is important because the regulation of the marine environment and decision-making must be based upon sound scientific advice on the status of the CRD and the resources that it supports. In the latter regard, there is a need to establish regional scientific monitoring and assessment programmes based upon international cooperation and through the good offices of the FAO, IOC and the ISA, in conjunction with national science agencies in Central America. In this regard, the EU Marine Strategy Framework Directive[165] offers a good regional environmental monitoring science cooperation model that could be replicated in the Central Eastern Pacific.

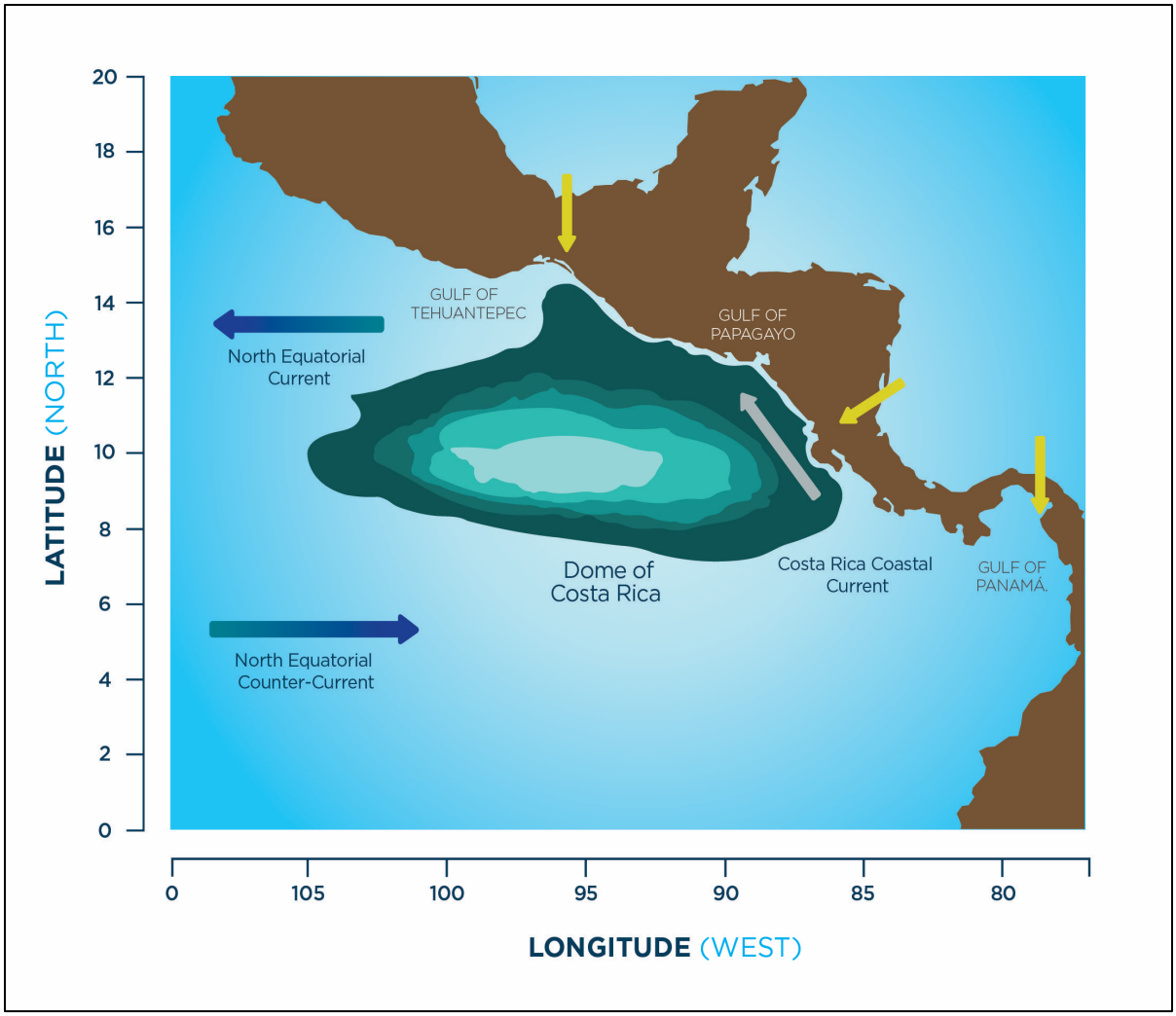
[165] European Union. Marine Strategy Framework Directive. Available at: http://www.msfd.eu

Figure 1. Geographical location of the CRD and persistence of the core area in ABNJ



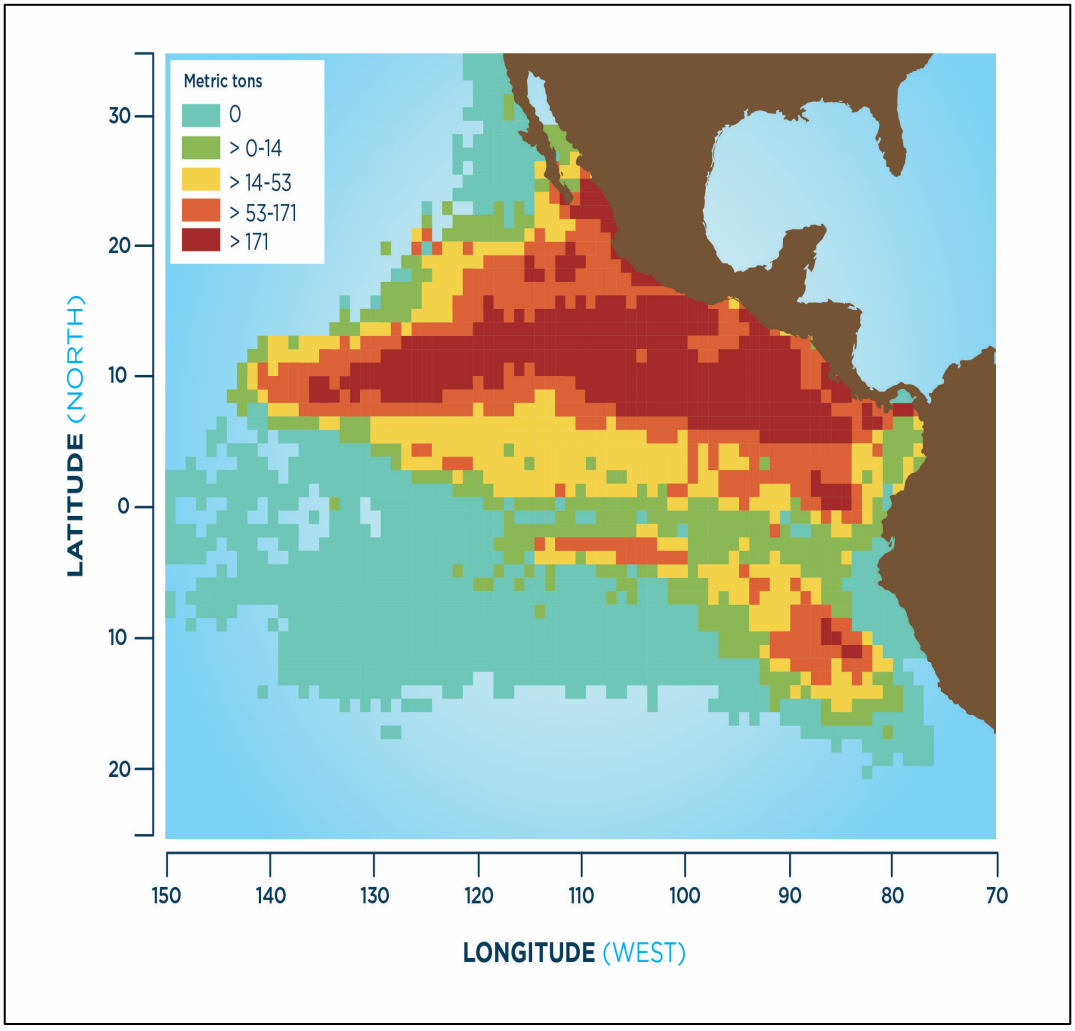
Source: MarViva Foundation, 2017. The persistence of the CRD was calculated by superimposing satellite images during the month of October in a thirty-year period (1980-2009).

Figure 2. Interaction between winds and marine currents in the CRD



Source: MarViva Foundation, 2017. The blue arrows represent the marine currents that interact with the wind jets (yellow arrows) generating the upwelling of cold water that forms the CRD.

Figure 3. Spatial pattern of tuna catches in the CRD region



Source: MarViva Foundation, 2017. Annual average catch of yellowfin tuna (Thunnus albacares) in the Eastern Tropical Pacific from 1985-1999. The average catches and effort are represented in 1° by 1° blocks (approximately 111 x 111 km).

CHAPTER 3. SNAPSHOT OF MULTILATERAL INSTRUMENTS FOR PROTECTING BIODIVERSITY IN ABNJ: PRESCRIPTIVE, DIFFUSE AND REQUIRING FURTHER ENHANCEMENT

3.1 INTRODUCTION

The legal regime applicable to the conservation and sustainable use of marine resources in areas beyond national jurisdiction has evolved considerably over the past decade.[1] The United Nations Convention on the Law of the Sea nonetheless remains the principal multilateral instrument regulating all ocean related activities.[2] In addition, it is supplemented by two Implementing Agreements, which have been adopted to regulate straddling and migratory fish stocks as well as mineral extraction from the international seabed area, namely: the Agreement for the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, [3] and the 1994 Agreement relating to the implementation of Part XI of the UNCLOS.[4] This framework is complemented by instruments adopted under the auspices of international bodies including: the United Nations Environment Programme, the United Nations Development Programme, the FAO; [5] as well as complementary international treaties

[1] D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015); Y. Tanaka, *The International Law of the Sea,* 2 ed., (Cambridge: CUP, 2015); see D. Rothwell, T. Stephens, *The International Law of the Sea*, 2 ed., (Oxford and Portland Oregon: Hart Publishing, 2016); D. Attard Gen (ed.), *The IMLI Manual on International Maritime Law* Vols. 1-3 (Oxford: OUP, 2014-2016).

[2] UNCLOS. Recital 4. See also: M. Nordquist, S. Nandan, S. Rosenne (eds.), *United Nations Convention on the Law of the Sea 1982: A Commentary*, Vols. 1-7, (Leiden/Boston: Brill, 1986-2011). Cited as the "Virginia Commentary."

[3] United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. 2167 UNTS 88. Entered into force on December 11, 2001.

[4] 1994 Agreement Relating to the Implementation of Part XI of the UNCLOS of 10 December 1982. 1836 UNTS 42. Entered into force on July 28, 1996.

[5] Food and Agriculture Organisation of the United Nations (FAO), Global Environment Facility (GEF), Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organisation (UNESCO-IOC), International Maritime Organisation (IMO), International Seabed Authority (ISA).

such as the Convention on Biological Diversity,[6] the Convention on International Trade in Endangered Species of Wild Flora and Fauna,[7] the Convention on Migratory Species[8] and the International Convention for the Regulation of Whaling,[9] amongst others. These instruments are complemented by political initiatives such as the United Nations General Assembly (hereafter, UNGA) Resolutions, for instance A/RES/56/12,[10] which encourage coastal States to enhance their national capacity to improve their marine management systems and promote the protection of the marine environment and ecosystems.[11] Moreover, UNGA Resolutions invite the relevant Agencies of the United Nations system and regional organisations to take effective measures to assist the coastal States in this regard.[12] In parallel with these initiatives, a number of United Nations Agencies and other international organisations have worked to consolidate area based management tools (hereafter, ABMTs) and regulations, with the objective of conserving marine resources and protecting biodiversity in ABNJ.[13] Accordingly, the aim of the chapter is to address two specific research issues. First, to identify and comment briefly on the legal instruments and area based management tools that are relevant to the conservation of marine biodiversity in ABNJ, as well as their potential applicability to address the challenges of managing human activities that impinge upon or take place in the Costa Rica Dome. Secondly, to pay specific attention to lacunae in the multilateral regulatory framework and why it is necessary to adopt a new implementation agreement under UNCLOS, along with measures for the Eastern Tropical Pacific in the form of a regional agreement. The structure and form of the latter will be elaborated upon in further detail in Chapter 9.

3.2 NORMATIVE BLUEPRINT FOR THE OCEAN: UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

[6] Convention on Biological Diversity. 1760 UNTS 79. Entered into force on 29 December, 1993.
[7] Convention on International Trade in Endangered Species of Wild Flora and Fauna. 993 UNTS 243. Entered into force on 1 July, 1975.
[8] Convention on Migratory Species. 1651 UNTS 333. Entered into force on 1 November, 1983.
[9] International Convention for the Regulation of Whaling. 161 UNTS 72. Entered into force on 10 November, 1948.
[10] UNGA Resolution A/RES/56/12, 13 December 2001.
[11] Ibid. Para. 35, 42.
[12] Ibid. Para. 24, 37, 50. See also: UNGA Resolution A/66/189, 27 July 2011.
[13] See Chapter 8.

The United Nations Convention on the Law of the Sea (UNCLOS)[14] is the principal legal framework instrument governing uses of the sea and has almost universal acceptance with 167 States Parties and the European Union.[15] The Convention is made-up of 320 Articles and 9 Annexes which address all aspects of maritime space, including: the sovereign rights and jurisdiction of coastal States over maritime zones within national jurisdiction and their resources; the high seas, the international seabed area (the Area), the protection and preservation of the marine environment, marine scientific research, development and transfer of marine technology, settlement of disputes as well as comprehensive general provisions. The Convention also provides a legal basis for the establishment of three new institutions: the International Seabed Authority (hereafter, ISA), the Commission on the Limits of the Continental Shelf (hereafter, CLCS), and the international Tribunal for the Law of the Sea (hereafter, ITLOS). UNCLOS codifies a number of norms in customary international law and saw the progressive development of international law in several important respects including the provision of a solid legal plinth for the promotion of the peaceful uses of the ocean, the equitable use of resources and the conservation of living resources, as well as the protection of the marine environment.[16] Significantly, the Convention advances an integrated approach to the management of human activities that impinge upon the ocean,[17] as well as codifies the principle of the common heritage of mankind as it applies to the Area.[18]

The high seas are governed by Part VII of the Convention and is open to all States, as well as subject to the freedom of navigation, overflight, the laying of submarine cables and pipelines, the construction of artificial islands and other installations, fishing and scientific research.[19] The high seas must be reserved for peaceful purposes and the aforementioned activities must be conducted with due regard for the rights under the

[14] United Nations on the Law of the Sea. 1833 UNTS. 3/21 ILM 1261 (1982). Entered into force on 16 November, 1994.
[15] 1833 U.N.T.S. 3/21 ILM 1261 (1982). Entered into force on 16 November, 1994. As of 25 May 2016, 167 States Parties and the European Union. There are 30 non-parties to the Convention including four in Latin America: Peru, El Salvador, Colombia and Venezuela. NORDQUIST Vols. 1-6.
[16] UNCLOS. Recital 4.
[17] Y. Tanaka, *A Dual Approach to Ocean Governance: The cases of the zonal and integrated management in international law of the sea* (Farnham: Ashgate, 2008), *passim*.
[18] UNCLOS. Article 136.
[19] Ibid. Article 87.

Convention and other rules of international law.[20] The high seas freedoms are not absolute and are subject to other rules of international law including the general duty to protect and preserve the marine environment, as well as extensive multilateral regional agreements on specific aspects of marine environmental protection and maritime security.[21]

Importantly, UNCLOS provides a general normative framework that is complemented and developed by other specialist instruments. Thus, for example, although all States have the right for their nationals to engage in fishing on the high seas, this is conditioned by the observance of Treaty obligations appertaining to States, as well as the rights, duties and interests of coastal States set down by the Convention,[22] including most crucially the obligations on the conservation and management of the living resources of the high seas.[23] Furthermore, as will be seen in chapter 4, it needs to be emphasized that fishing activity on the high seas is subject to a great deal of regulations which augment the Convention, including the 1995 Fish Stocks Agreement,[24] as well as several other multilateral and regional instruments. All of the latter lay down specific requirements in relation to the conservation and management of fisheries resources.[25] In addition, many fisheries related instruments set down requirements in relation to the adoption of precautionary and ecosystems based approaches to fisheries management with a view to reducing the impacts of fishing activities on marine habitats and dependent ecosystems.[26]

Following both customary and Treaty law, the high seas is subject to the freedom of navigation and every State has the right to sail ships flying its flag on the high seas,[27] subject to the conditions applicable to the nationality of ships and the existence of a

[20] Ibid. Articles 87-88.
[21] Ibid. Articles 94, 117, 192, 194(3)(b), 211, 212, 216 and 217.
[22] Ibid. Article 63(2), 64-67.
[23] Ibid. Articles 117-119. See: K. Gjerde, 'High seas fisheries management under the Convention on the Law of the Sea' in R. Barnes, D. Freestone, D. Ong (ed.), *The Law of the Sea–Progress and Prospects* (Oxford: Oxford University Press, 2006) 281.
[24] The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 2167 UNTS 88. Entered into force on December 11, 2001. See note 3.
[25] P. Birnie, A. Boyle, C. Redgwell, *International Law & the Environment* (Oxford: Oxford University Press, 2009) 3rd ed. 739. See also: Y. Takei, *Filling Regulatory Gaps in High Seas Fisheries*. (Brill/Nijhoff Publishers, 2013). Chapter 2.
[26] UNCLOS. Article 92.
[27] Ibid. Article 90.

genuine link between the State and the ship.[28] The Convention sets down a list of duties that must be discharged by the flag State in exercising its jurisdiction in relation to vessels that are flying its flag on the high seas.[29] In general, the jurisdiction of the flag State is exclusive in relation to its vessels on the high seas, save in exceptional circumstances set out by the Convention and since progressively developed under international law. [30] Exceptionally, international Treaties, whether bilateral or multilateral, may provide for concurrent jurisdiction in given circumstances.[31] Shipping and navigation are addressed by comprehensive regulatory codes adopted by the International Maritime Organisation (hereafter, IMO), the International Labour Organisation (hereafter, ILO) and by other UN specialist bodies and agencies.[32] However, the United Nations Secretary-General has reported that the failure by the flag State to exercise jurisdiction over its vessels on the high seas, in particular fishing vessels, constitutes a major problem in addressing the threats to marine ecosystems and biodiversity beyond national jurisdiction.[33] In this regard, the lack of effective flag State control over ships flying their flag can pose a threat to the safety of navigation, to maritime security and to the marine environment.[34]

Part XIII of the Convention sets out the rules on marine scientific research including research on the high seas, which must be conducted for peaceful purposes, with appropriate scientific methods and should not interfere with other legitimate uses of the sea, as well as be in compliance with regulations for the protection and preservation of the marine environment.[35] The Convention also specifies the promotion of international cooperation and the creation of favourable research conditions.[36] In ABNJ, all States and competent international organisations have the right to conduct research in the Area in conformity with Part XI,[37] and in the water column beyond the EEZ.[38] Nonetheless, high seas marine scientific research (hereafter, MSR) is unregulated and

[28] Ibid. Article 91.
[29] Ibid. Article 94.
[30] Ibid. Article 92.
[31] See M. H. Nordquist *et al.* (eds.), Unit*ed Nations Convention on the Law of the Sea 1982 – A Commentary* (The Hague: Martinus Nijhoff Publishers, 1995) Volume III, 126.
[32] The institutional and legal framework on fisheries, shipping and mining will be addressed in Chapter 4.
[33] UN Doc. 64 A/59/62/Add.1 at 22, para.71, 63-64.
[34] UN Doc. A/66/70/Add.1 at 67, para. 285.
[35] UNCLOS. Article 240.
[36] Ibid. Articles 242-243.
[37] Ibid. Article 256.
[38] Ibid. Article 257.

few States have adopted legislation to give effect to the obligations that arise under Part XIII. On the other hand, disputes in relation to scientific research on the high seas are subject to the compulsory dispute procedures in accordance with Part XV of the Convention. At the time of writing, no such dispute on MSR has arisen for determination by the dispute settlement bodies under the Convention. Clearly, many States strongly uphold the freedom of scientific research and are opposed to the regulation of research activities on the high seas including the United States, the Russian Federation, Japan and the European Union.[39] Scientific research on the high seas over the continental shelf beyond 200 nautical miles is a high seas freedom but must not interfere with shipping routes and deployed equipment must satisfy the identification requirements of the State of registry or international organisation conducting the research.[40] In the context of the Area, MSR must be carried out for the benefit of mankind as a whole.[41] The ISA promotes and encourages the conduct of marine scientific research in the Area, as well as the coordination and dissemination of research results. States Parties may also carry out research in the Area, but are compelled to promote international cooperation through the development of programmes with the ISA or other competent international organisations.[42]

All States have the right to lay seabed cables and pipelines on the high seas beyond the continental shelf, but must have due regard to cables and pipelines already in position.[43] The laying of submarine cables in ABNJ is a topic for evaluation in the context of international negotiations on a new legally binding instrument for the conservation and sustainable use of marine biodiversity in areas beyond national

[39] Second session of the BBNJ Prepatory Committee at the United Nations. 26 August – 9 September 2016. Statement by the United States. Monday, March 28, 2016. Available at: http://statements.unmeetings.org/media2/7656861/united-states.pdf. Statement by the Russian Federation. Monday, March 28, 2016. Available at: http://statements.unmeetings.org/media2/7656834/russian-federation.pdf. Statement by Japan. Monday, March 28, 2016. Available at: http://statements.unmeetings.org/media2/7656879/japan.pdf. Statement by the European Union. Thursday, March 31, 2016. Available at: http://statements.unmeetings.org/media2/7658026/eu-statement-7-cbtmt-as-delivered-on-31-03-2016-.pdf

[40] UNCLOS. Articles 261-262.

[41] Ibid. Article 143.

[42] Ibid. Article 143.

[43] Ibid. Article 112, 79(5). See also on submarine cables: D. Burnett, B. Beckman, T. Davenport, *Submarine Cables: The Handbook of Law and Policy* (Leiden/Boston: Brill/Nijhoff, 2015) 63.

jurisdiction (hereafter, BBNJ negotiation), as will be seen later in this study.[44] Furthermore, there are specific cables in the CRD region including the Pan-American Crossing (PAC), South America-1 (SAm-1) and the South America Pacific Link (SAPL), which will have to be taken into consideration in any future regional conservation scheme for the CRD.[45]

The regime that applies to the Area, which is the seabed and ocean floor subsoil thereof beyond the limits of national jurisdiction is set out in Part XI and Annex I of the Convention, as well as in the 1994 Implementation Agreement and the regulations and decisions adopted by the International Seabed Authority.[46] The mineral resources of the Area are the common heritage of mankind, and States exercise control over these resources by means of the good offices of the International Seabed Authority including the sharing of benefits derived therefrom.[47] Activities that take place in the Area are governed by Part XI and no State must claim or exercise sovereignty or sovereign rights over its resources.[48] The activities in question are defined in the Convention as "all activities of exploration for, and exploitation of, the resources of the Area"[49] and the Convention is fleshed-out and subject to major amendment by the 1994 Agreement relating to the implementation of Part XI of the UNCLOS of 10 December 1982.[50] Furthermore, the Seabed Disputes Chamber of ITLOS stated in the Area Advisory Opinion as follows:

> The expression "*activities in the Area*", in the context of both exploration and exploitation, includes, first of all, the recovery of minerals from the seabed and their lifting to the water surface... Activities directly connected with those mentioned in the previous paragraph such as the evacuation of water from the minerals and the preliminary separation of materials of no commercial interest, including their disposal at sea, are deemed to be covered by the expression

[44] Chapter 8. Also see unpublished paper by C. Duarte, 'Marine Biological Diversity of Areas Beyond National Jurisdiction: Jurisdiction in relation to submarine cables' at the International Cable Protection Committee' s 2017 Plenary Meeting, Montevideo, Uruguay, 21 April 2017.
[45] See: TeleGeography Submarine Cable Map. Available at: http://submarinecablemap.com/#/submarine-cable/pan-american-crossing-pac.
[46] UNCLOS. Article 1(1).
[47] Ibid. Article 136.
[48] Ibid. Article 134(2), 137(1).
[49] Ibid. Article 1.1 (3).
[50] 1994 Agreement Relating to the Implementation of Part XI of the UNCLOS of 10 December 1982. 1836 UNTS 42. Entered into force on July 28, 1996. See note 4.

> "activities in the Area". "Processing", namely, the process through which metals are extracted from the minerals and which is normally conducted at a plant situated on land is excluded from the expression "activities in the Area."[51]

Overall, States have a general duty to protect and preserve the marine environment and to exploit natural resources in accordance with environmental policies.[52] The Convention provides a comprehensive code aimed at regulating pollution from land-based-sources, seabed activities subject to national jurisdiction, activities in the Area, dumping, vessels, as well as pollution from or through the atmosphere.[53] Crucially, States are obliged to cooperate on a global and regional basis to ensure environmental protection. There are specific provisions on monitoring the risks and effects of pollution, environmental assessment, as well as on enforcement,[54] responsibility and liability.[55] In addition, there are specialist multilateral and regional agreements on the protection of the environment, given the symbiotic relationship between the development of law on conservation and the development of scientific knowledge.[56]

In this regard, Dr. Verlaan has pointed out that:

> It is now generally accepted that most, not all, of the environmental provisions of the Law of the Sea Convention, and especially those set out in Part XII, have attained the status of customary international law. As the LOSC does not exempt high seas freedom from its environmental provision, it is probable that their applicability to at least those freedoms as set out under article 87 have customary international status as well.[57]

The latter is an important consideration as it binds non State Parties to the Convention such as the United States to the aforementioned environmental provisions. In particular,

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[51] *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, ITLOS Case No 17 (Advisory Opinion) [2011] ITLOS Rep 10, [77] (hereinafter *Area Advisory Opinion*). Paras. 94-95.
[52] UNCLOS. Articles 192-197.
[53] Ibid. Article 194, 207-212.
[54] Ibid. Articles 211 (5), 213-220, 222, 224.
[55] Ibid. Article 235.
[56] Birnie, Boyle, Redgwell, above n 25, 711.
[57] P. Verlaan 'Marine Scientific Research: Its potential contribution to achieving responsible High Seas Governance.' *The International Journal of Marine and Coastal Law*, 27 (4) (2012). 810.

they must meet the general commitments in relation to the protection of the marine environment, preservation of fragile ecosystems and the conservation of living resources.[58]

There are a number of additional general points that can be made in relation to the obligations that arise under Part XII in the context of the arguments advanced by this thesis. Firstly, it must be pointed out that the environmental provisions in UNCLOS are based on a scientific understanding of the marine environment during the 1970, when vessel source pollution and unsustainable fisheries were the two major threats to offshore living resources. Almost four decades ago, new challenges and impacts resulting from advances in technology such as deep-sea fishing gear, as well as climate change effects, were not anticipated, and "most of the diverse and vulnerable deep sea ecosystems, such as hydrothermal vents, cold-water corals and most seamounts were yet to be discovered."[59] In other words, there was a major deficit in scientific knowledge about the status and functioning of the marine environment, as well as the implications of the adverse effects of anthropogenic impacts on the health of marine ecosystems.

Secondly, cooperation on a global or regional basis is a fundamental obligation placed on States and international organisations by UNCLOS. Cooperation is required specifically in the formulation and elaboration of international rules,[60] where standards and procedures for the protection and preservation of the marine environment should take into account the characteristics of regional features. Indeed, Judge Wolfrum in his separate opinion in the *Mox Plant* case described the obligation of cooperation as the *Grundnorm* of Part XII of the Convention.[61]

Thirdly, over the past two decades, considerable scholarship has been undertaken and published on the normative content of the legal obligations pertaining to environmental

[58] UNEP-MAP-RAC/SPA. 2011. Note on the establishment of marine protected areas beyond national jurisdiction or in areas where the limits of national sovereignty or jurisdiction have not yet been defined in the Mediterranean Sea. By Scovazzi, T. (ed.), RAC/SPA, Tunis: 47. 26.
[59] N. C. Ban, et. al., 'Systematic conservation planning: A better recipe for managing the High Seas for biodiversity conservation and sustainable use,' *Conservation Letters*. January/February 2014, 7(1), 41–54. 2.
[60] UNCLOS. Article 197.
[61] *The MOX Plant Case (Ireland v United Kingdom)*, ITLOS Order 2001/5 of 13 November 2001. Separate Opinion of Judge Wolfrum.

protection of ABNJ. Among others, Kristina Gjerde[62] has identified gaps[63] and weaknesses of the regulations included in Part XII of UNCLOS, in relation to conservation and management measures for marine resources on the high seas. According to Gjerde, some of principal weaknesses arising in practice include the following: the general duty to protect and preserve the marine environment under the Convention has been inadequately implemented, leaving ABNJ subject to increasing pressures, degradation and biodiversity loss.[64] In this regard, it is important to keep in mind that the zonal approach to maritime jurisdiction advanced by the Convention is on the basis of linear distances from the baselines, the 200 nm EEZ and fishery limits in particular, which fails to recognize the connectivity of ecosystems or species that straddle or migrate between areas under and beyond national jurisdiction.[65] The focus in UNCLOS on marine pollution means that more recent concerns touching upon marine biodiversity in ABNJ including access to genetic resources, species and ecosystems protection, as well as measures to respond to climate intervention are not specifically addressed by the Convention. In this context, it ought to be noted that a portion of high seas in the CRD is superjacent to coastal State continental shelf, which extends 200 miles beyond the baseline of Costa Rica.[66] In this area, States exercise sovereign rights on the continental margin in relation to exploring and exploiting non-living resources as well as sedentary species.[67] They may also adopt policies pertaining to continental shelf biodiversity including establishing marine protected areas (MPAs) for this purpose.[68] Although there is no specific duty under UNCLOS to conserve and manage continental shelf resources, as seen previously, coastal States have a general obligation to protect the marine environment and to ensure the exploitation of natural

[62] K. Gjerde (2012) 'Challenges to protecting the marine environment beyond national jurisdiction,' *The International Journal of Marine and Coastal Law*, Vol. 27(4), 842, 843.
[63] Ibid. 842.
[64] Ibid. 844.
[65] D. Tladi, 'Ocean Governance: A fragmented regulatory regime' in P. Jacquest, R.K. Pachauri, L. Tubiana (eds.), *Oceans: The New Frontier* (TERI Press: Delhi, 2011) 99-110.
[66] UNCLOS. Article 76(4)-(6). Preliminary information indicative of the outer limits of the continental shelf and description of the status of preparation of making a submission to the Commission on the Limits of the Continental Shelf for the Republic of Costa Rica. Available at: https://www.un.org/Depts/los/clcs_new/submissions_files/preliminary/cri2009informacion_preliminar.pdf
However, under the note MINIC-UN-022-10, April 2010, the Government of Reconciliation and National Unity of Nicaragua has expressed a reservation regarding the Preliminary information of the outer limits of the continental shelf for the Republic of Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/nic_re_cri_2010_en.pdf
[67] UNCLOS. Article 77(4).
[68] This may include establishing marine protected areas or the adoption of other environmental measures, see J. Mossop (2007) 'Protecting biodiversity on the continental shelf beyond 200 nautical miles,' *Ocean Development and International Law,* Vol. 38, 283, 289.

resources pursuant to environmental policies.[69] Furthermore, there are complex legal issues to be resolved in relation to the precise linkages between the protection of biodiversity within national jurisdiction and beyond and these are addressed in further detail in chapter 8 in context of the principle of adjacency.[70] Finally, it ought to be noted that there is a major lacuna in the Convention in relation to the conservation and sustainable use of biodiversity in ABNJ and this is now the focus of the BBNJ negotiation process, which is explored in chapter 8. Suffice to note here, international practice and law-making in respect to environmental protection has been largely reactionary in response to specific risks, leaving many activities with a potential to cause significant adverse impacts in ABNJ unregulated or under-regulated.[71] In addition, as will be seen in the cases studies presented in chapters 6 and 7, the duty of cooperation on global and regional basis has been unevenly implemented[72], leaving many geographic gaps, particularly in the Central American Pacific. In the absence of robust regional structures, there is no competent global body with a mandate to adopt common rules on the conservation and sustainable use of biodiversity, or on the monitoring of the environment and assessment of activities in the CRD. Furthermore, and as mentioned previously, the primary emphasis in UNCLOS on flag State enforcement of marine environmental laws in ABNJ, fails to address adequately the use of flags of convenience and the lack of capacity of flag States or indeed the political will to enforce international or regional obligations.[73]

Clearly, UNCLOS sets out the general framework for environmental protection that applies in all ocean regions including the CRD, but it rests with States, and most notably the Central American countries, to protect biodiversity and to ensure that shared marine living resources in the region are available for future generations, and

[69] UNCLOS. Articles 192, 194.
[70] 'MPAs adjacent to or adjoining areas under national jurisdiction: legal and practical challenges workshop on an ILBI on ABNJ,' Government of Portugal and the High Seas Alliance. Lisbon, 2-3 March 2017. See also: J. Mossop, 'Reconciling activities on the extended continental shelf with protection of the marine environment' in R. Rayfuse (ed.), *Research Handbook on Marine Environmental Law* (Cheltenham: Edward Elgar, 2015). Also see: J. Mossop, *The Continental Shelf Beyond 200 Nautical Miles. Rights and Responsibilities* (Oxford: Oxford University Press, 2017).
[71] Gjerde, above n 62, 844.
[72] Ibid.
[73] Ibid. 846. Also see: R. Long, 'The Anthropocene, autopoiesis and the disingenuousness of the genuine link: Addressing enforcement gaps in the legal regime for areas beyond national jurisdiction' (Commentary on Rosemary Rayfuse) in A. Oude Elferink, E. J. Molenaar (eds.), *The international legal regime of areas beyond national jurisdiction: Current and future developments* (The Hague: Martinus Nijhoff, 2009), 191-204.

avoid undermining the productivity of this area and the economic benefits dependent on the healthy state of marine ecosystems. Regional approaches are thus an absolute corollary of the multilateral framework and this is explored further in chapters 5, 6 and 7.

3.3 ADVANCING THE TWIN PILLARS OF CONSERVATION AND SUSTAINABILITY: THE CONVENTION ON BIOLOGICAL DIVERSITY

Apart from UNCLOS, there are several other international instruments that are applicable to the conservation of biodiversity in the marine environment and that are directly relevant to the conservation of the unique marine ecosystems associated with the CRD. Most notably, the Convention on Biological Diversity (hereafter, CBD)[74] provides an over-arching conservation framework and has become one of the most widely ratified of all environmental treaties with 196 Parties including all Central American States concerned with the CRD.[75] According to its preamble, the conservation of biological diversity is a common concern of humankind.[76] Moreover, there is an express obligation placed by the CBD on States to conserve and to ensure the sustainable use of their biological diversity and its resources.[77] The CBD applies both to terrestrial and marine biological biodiversity.[78] In relation to the latter, and from an early stage after the Convention entered into force, the Jakarta Ministerial Statement reaffirmed the urgency for the CBD Conference of the Parties to address the conservation and sustainable use of marine and coastal biological diversity.[79]

In advancing a scheme of protection, the Convention aims to achieve an equitable balance of interests of developed and developing countries,[80] and has three main objectives, namely: a) the conservation of biodiversity, b) the sustainable use of its components, and c) the fair and equitable sharing of benefits arising from the utilization

[74] Convention on Biological Diversity. 1760 UNTS 79. Entered into force 29 December, 1993. See note 6.
[75] Birnie, Boyle, Redgwell, above n 25, 612.
[76] CBD. Recital 3.
[77] Ibid. Recital 5.
[78] Tanaka, above n 1, 341.
[79] Jakarta Ministerial Statement on the Implementation of the Convention of Biological Diversity, para. 14.
[80] Birnie, Boyle, Redgwell, above n 25, 616.

of genetic resources.[81] The material scope of the CBD comprises the conservation and sustainable use of *biological diversity*, defined as the variability among living organisms from all sources, *inter alia* terrestrial, marine and aquatic; and its *resources*, which includes genetic resources, organisms, populations or biotic components of ecosystems with actual or potential use or value.[82]

In regards to the geographical and material scope, the CBD adopts a zonal approach with a distinction made between biodiversity within and beyond national jurisdiction. More specifically, the CBD applies within national jurisdiction to the components of biological diversity. Whereas both within and beyond national jurisdiction, it applies to the processes and activities carried out under its jurisdiction or control, regardless of where their effects occur.[83] Moreover, in ABNJ, each Contracting Party is only obliged to cooperate with other Parties for the conservation and sustainable use of biological diversity, or through competent international organisations.[84] Crucially, as seen, the CBD provisions apply restrictively in that activities carried out within a State´s jurisdiction must not cause damage to the environment of other States or in ABNJ.[85] Similarly, the responsibility for overviewing compliance with the Convention´s requirements generally falls within the competence, if any, of appropriate international and regional bodies.[86] As noted by Dr. Warner, one of the principal weaknesses in the normative framework is that there is no direct duty on the Contracting Parties to the CBD to conserve or sustainably use biodiversity in ABNJ.[87]

In addition, it ought to be noted that the scope of the CBD and UNCLOS overlaps in regard to marine living resources and the protection of the marine environment. Specifically, on marine environmental matters, the CBD Parties must implement the Convention consistently with the rights and obligations of States under the Law of the Sea.[88] Article 237 of UNCLOS establishes that specific obligations assumed by States under special Conventions on the protection and preservation of the marine

[81] CBD. Article 1.
[82] Ibid. Article 2.
[83] Ibid. Article 4. See also: Tanaka, above n 1, 345.
[84] Ibid. Article 5.
[85] Ibid. Article 4. Other provisions within the CBD that mention areas beyond national jurisdiction are articles 3, 4, 5, 14(c), 14(d).
[86] Birnie, Boyle, Redgwell, above n 25, 637.
[87] R. Warner, 'Marine Biodersity in Areas Beyond National Jurisdiction' in D. Rothwell et. al., *Oxford Handbook of International Law* (Oxford: Oxford University Press, 2015) 757.
[88] CBD. Article 22(2). See also: Birnie, Boyle, Redgwell, above n 25, 750.

environment and provides that these should be carried out consistently with the general principles and objectives of UNCLOS.[89] Moreover, it is generally accepted that the CBD regime prevails over Part XII of UNCLOS given its *lex specialis* status.[90] Thus, for example, the establishment of a protected area under the CBD on the continental margin of Costa Rica with a view to reducing serious damage to biodiversity from high seas fishing would not be incompatible with UNCLOS,[91] provided the scheme of protection is consistent with the due regard provisions applicable to the the rights and obligations of other States under UNCLOS and related agreements.[92]

Among its elaborate provisions, the CBD provides a strong normative basis for the following: the principle of sovereignty of States to exploit their natural resources, applying their own environmental policies;[93] cooperation among States and through international organisations in regard to matters of mutual interest in ABNJ; [94] development of general measures for conservation and sustainable use;[95] identification and monitoring of biological diversity;[96] establishment of *in situ* conservation measures such as the establishment of protected areas[97] and management strategies;[98] as well as the development of regulatory provisions for the protection of threatened species populations; [99] and *ex-situ* conservation measures of components of biological diversity.[100] As noted above, cooperation is very much the *Grundnorm* of marine environmental law and Article 5 of CBD is thus very important in so far as it requires all States Parties to CBD:

> As far as possible and as appropriate, cooperate with other Contracting Parties, directly or, where appropriate, through competent international organisations, in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biological diversity.[101]

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[89] UNCLOS. Article 237(2).
[90] Birnie, Boyle, Redgwell, above n 25, 750.
[91] Ibid.
[92] See note 70, and the discussion of adjacency in Chapter 8.
[93] CBD. Article 4.
[94] Ibid.Article 5.
[95] Ibid. Article 6.
[96] Ibid. Article 7.
[97] Ibid. Article 8 (a).
[98] Ibid. Article 8 (f).
[99] Ibid. Article 8 (k).
[100] Ibid. Article 9.
[101] Ibid. Article 5.

Thus the focus and scope of the Treaty clearly extends to ABNJ. Moreover, the Convention advances a spatial management approach to marine environmental protection, providing a legal basis for the designation of sea areas as an ecologically or biologically significant marine area (hereafter, EBSA) on the basis of the following criteria: uniqueness or rarity; special importance for life history stages of species; importance for threatened, endangered or declining species and/or habitats; vulnerability, fragility, sensitivity, or slow recovery; biological productivity; biological diversity; and naturalness.[102] As was mentioned previously, part of the CRD was described as an EBSA under the name "Papagayo Upwelling system and adjacent areas" in 2014.[103] At a global level, 71 EBSA out of a total of 279 are located wholly or partially beyond national jurisdiction, comprising 21 per cent of total surface area of marine areas beyond national jurisdiction.[104] Other than indicating that these areas may require enhanced management and conservation, the description of an EBSA has no legal significance *strictu sensu* but can be taken into account by other international processes charged with managing and conserving ocean resources. In particular, information shared through the EBSA declaration process can inform the scientific basis for the adoption of protective provisions by States or other international bodies that have mandates or competence to regulate specific sector activities. Accordingly, the declaration of an EBSA is a scientific and technical exercise that can inform the application of ABMTs, marine spatial planning and impact assessment both within and beyond national jurisdiction.[105]

CBD is clearly complementary to UNCLOS and central theme in the work of the Conference of the Parties (hereafter, CoP) is following-up on Article 5 by engendering greater cooperation and coordination among States Parties and international organisations "to identify and adopt, according to their competence, appropriate measures for conservation and sustainable use in relation to ecologically or biologically significant areas, and in accordance with international law, including UNCLOS."[106]

[102] Annex I, Decision IX/20, COP.
[103] UNEP/CBD/COP/DEC/XII/22.
[104] Third Session of the BBNJ Preparatory Committee. March 26 – April 7, 2017. Statement of CBD. Wednesday, March 29, 2017. Available at http://statements.unmeetings.org/media2/14683376/-scbd-bbnj-29-mar-2017-.pdf
[105] C. Dunn, et. al. (2014) 'The Convention on Biological Diversity's Ecologically or Biologically Significant Areas: Origins, development, and current status', *Marine Policy*, Vol. 49, 137-145.
[106] CBD Decision X/29. Para 22.

This extends to the establishment of a representative networks of MPAs in accordance with international law based on the *best scientific information available*.[107] Furthermore, for the purpose of improving scientific knowledge of EBSAs, States Parties, intergovernmental organisations and other non-State actors are encouraged to share scientific data relating to marine biological diversity, the application of the ecosystem approach and the precautionary approach, as well as a means to integrate existing regional and national conservation efforts.[108] One inherent weakness in the declaration process is that the effectiveness of EBSAs is very much dependent upon the measures adopted by States Parties and international organisations to protect and preserve the marine environment.

The CBD provides for the undertaking of environmental impact assessment as an up-to-date tool to avoid or minimize adverse effects from proposed projects on biological diversity, and calls for States to develop appropriate procedures and arrangements, including the notification and initiation of actions to prevent or minimize grave danger or damage to biodiversity.[109] Among its other innovative provisions, the Convention provides a sophisticated scheme governing access to genetic resources under national jurisdiction in light of the sovereign rights that States have over these resources.[110] Access is subject to prior informed consent of the Party providing such resources[111] and the sharing of benefits arising from the commercial and other utilization of genetic resources should be in a fair and equitable way.[112] Benefits deriving from actual use of genetic resources include participation in scientific research[113] and uses of relevant technology.[114] Within the CBD framework, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising[115] develops a detailed regime on this matter.[116] The Protocol applies to genetic resources within the scope of article 15 of the CBD, to traditional knowledge associated with genetic resources and

[107] Ibid.
[108] Ibid. Para. 39.
[109] CBD. Article 14.
[110] Ibid. Article 15(1).
[111] Ibid. Article 15(5).
[112] Ibid. Article 15(7).
[113] Ibid. Article 15(6).
[114] Ibid. Articles 16(3), 19(1), 19(2). See also: Birnie, Boyle, Redgwell, above n 25, 631.
[115] Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, UN Doc UNEP/CBD/COP/DEC/X1. Entered into force on 12 October 2014.
[116] Access to marine genetic resources is addressed in further detail in Chapter 8.

to the benefits arising from the utilization of such resources and knowledge.[117] Under the Protocol, Parties are required to consider the need for, and modalities of, a global multilateral benefit-sharing mechanism to address the fair and equitable sharing of benefits.[118]

However the geographical scope of the Nagoya Protocol only comprises areas under national jurisdiction. Therefore, access to marine genetic resources and benefit sharing in the high seas and the Area remain legal gaps, which are being addressed in the BBNJ negotiation process, which we will return to in detail in chapter 8.

Further elements reflected in the CBD are the sustainable use of components of biological diversity,[119] access to and transfer of technology,[120] the exchange of information from technical, scientific and socio-economic research,[121] the promotion of technical and scientific cooperation;[122] as well as financial mechanisms,[123] the establishment of an institutional framework,[124] and considerations on the adoption of protocols.[125] There is general consensus that the global framework set out by the CBD needs to be further amplified and elaborated by regional treaties in relation to marine biodiversity.[126]

Other instruments have been developed to further implement conservation and sustainable use measures in line with the primary objectives of the CBD including the adoption of the Aichi Biodiversity Targets.[127] Most notably for marine ecosystems, the Aichi Biodiversity Target 11 sets a commitment for Parties to protect 10 per cent of its coastal and marine areas by 2020, through systems of protected areas and other effective area-based conservation measures. However, a recent study[128] indicates that the 10 per cent target is highly unlikely to generate the benefits aspired to by the

[117] Nagoya Protocol. Article 3.
[118] Ibid. Article 10.
[119] CBD. Article 10.
[120] Ibid. Article 16.
[121] Ibid. Article 17.
[122] Ibid. Article 18.
[123] Ibid. Articles 20-21.
[124] Ibid. Articles 23-25.
[125] Ibid. Article 28.
[126] Tanaka, above n 1, 346.
[127] CBD (2017) *Aichi Biodiversity Targets*. Available at: http://www.cbd.int/sp/targets/
[128] B. O'Leary, et. al., (2016) 'Effective coverage targets for ocean protection,' *Conservation Letters*, Vol. 5.

CBD,[129] and that the setting of a new target of 30 per cent designation of the ocean as MPAs is strongly supported by existing scientific evidence and should therefore be adopted as a more tenable global objective to achieve conservation goals.[130] That said, the Target of Goal 14 of the Sustainable Development Goals (hereafter, SDGs) is conservative and only requires the conservation of at least 10 per cent of coastal and marine areas by 2020.

All in all, CBD and related instruments are clearly relevant to the conservation and sustainable use of biodiversity in ABNJ. In particular, the EBSA declaration process will facilitate further action on the part of States and competent international organisations and may well lead to the application of ABMTs and environmental impact assessments (hereafter, EIA) for the purpose of conservation. Furthermore, the CoP of CBD endorsed the development and adoption of voluntary guidelines on EIA and Strategic Environmental Assessment (hereafter, SEA) for biodiversity in marine and coastal areas, which are also applicable in ABNJ.[131] Clearly, the guidelines are not legally binding but as noted by Dr. Warner they "emphasise the interconnections between ocean ecosystems across jurisdictional boundaries."[132]

3.4 RESTRICTING TRADE IN WILDLIFE: THE CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA

Species are declining globally not only because of loss of habitat but also because of increased exploitation, which is directly linked in many instances with commercial trade of endangered species of wild fauna and flora.[133] The Convention on International Trade in Endangered Species of Wild Fauna and Flora[134] (hereafter, CITES) aims to

[129] Ibid.
[130] The study also indicates that "in the rush to fulfill targets, there is also concern that MPAs will be designated in areas with low biodiversity value or few human activities to increase social and political acceptability. Likewise there is the risk of creating networks of paper parks where management and enforcement is negligible if it exists at all." O'Leary, above n 128.
[131] UNEP/CBD/COP/DEC/X/29, para. 50, using the guidance in Annexes II, III and IV to the Manila workshop report (UNEP/CBD/SBSTTA/14/INF/5).
[132] R. Warner, 'Conserving marine biodiversity in areas beyond national jurisdiction: Co-evolution and interaction with the Law of the Sea' in Rothwell, Oude Elferink, Scott and Stephens, above n 1, 769.
[133] Birnie, Boyle, Redgwell, above n 25, 685.
[134] Convention on International Trade in Endangered Species of Wild Fauna and Flora. 993 UNTS 243. Entered into force on 1 July, 1975. See note 7. For commentary, see: Hutton and

control the import and export of species and related products[135] thereby recognizing the ever-growing value of wild fauna and flora from scientific, cultural, recreational and economic perspectives.[136] CITES functions on the basis of an Appendix approach to conservation and the 182 State Parties to the Treaty must not allow trade (defined broadly to include export, re-export, import and introduction from the sea)[137] of species included in the Appendices, except in accordance with the provisions of the Convention.[138] The material scope of CITES is broad and it is significant to note that species that occur in the CRD are listed in the different Appendices of CITES including: a variety of cetaceans, such as the blue whale (*Balaenoptera musculus*), the common dolphin (*Delphinus delphis*) and the humpback whale (*Megaptera novaeangliae*); as well as marine turtles such as the leatherback turtle (*Dermochelys coriacea*); different species of sharks including the hammerhead sharks (*Sphyrna lewini)* and mobulid rays (*Manta spp*)**,** among several endangered others.[139] Crucially in light of the spatial distribution of marine species, it is significant to note that within the Central American Region, Costa Rica[140] and other 5 countries are Parties to CITES.

The level of protection accorded to the species depends upon their enumeration in various Appendices of CITES.[141] For instance, the highest level of protection is afforded to Appendix I species threatened with extinction, which are or may be affected by trade, and strict regulations apply in order not to further endanger their survival.[142] Appendix II includes species that may become threatened with extinction unless trade is subject to strict regulations.[143] Appendix III includes species which any Party

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Dickson (eds.), *Endangered Species Threatened Convention: The Past, Present and Future of CITES* (London, 2000).

[135] Birnie, Boyle, Redgwell, above n 25, 686.

[136] CITES. Recital 2.

[137] Ibid. Article 1(c).

[138] Ibid. Article 2 (4).

[139] Additional species that occur in the CRD and which are listed in CITES Appendices are the following: *balaenoptera edeni, balaenoptera borealis, balaenoptera musculus, balaenoptera physalus, megaptera novaeangliae, balaenoptera acutorostrata, eschrichtius robustus, berardius spp., physeter macrocephalus, carcharhinus longimanus, cetorhinus maximus, sphyrna lewini, sphyrna mokarran, sphyrna zygaena, carcharodon carcharias, rhincodon typus, manta spp.* CITES. Appendices I, II and III.

[140] CITES ratification dates from State Parties in the CRD distribution area are the following: Costa Rica (28/09/1975), Mexico (30/09/1991), Guatemala (05/02/1980), El Salvador (29/07/1987), Honduras (13/06/1985) and Nicaragua (04/11/1977). CITES, List of Contracting Parties.

[141] P. Sands, J. Peel, *Principles of International Environmental Law* (Cambridge: Cambridge University Press, 2012) 3rd ed. 472.

[142] CITES. Article 2 (1).

[143] Ibid. Article 2 (2).

identifies as being subject to regulation within its jurisdiction and which it wants to restrict its exploitation but needs the cooperation of other Parties in the control of trade.[144]

The Convention sets detailed provisions for trade in specimens of species included in Appendix I in exceptional circumstance:[145] including the prior grant and presentation of export,[146] import[147] or re-export[148] permits; as well as the introduction from the sea. The latter expression means "the transportation into a State of specimens of any species, which were taken in the marine environment not under the jurisdiction of any State", in other words ABNJ.[149] Likewise, for trade in specimens of species included in Appendix II, CITES regulates the prior grant and presentation of export,[150] import[151] and re-export[152] permits, as well as requiring introduction from the sea certificates.[153] The Convention has extensive provisions in regards to species listed in Appendix III, addressing in particular their export,[154] import[155] and re-export[156] by means of a permit system. The conditions for obtaining such permit are listed in Article 4(2) of CITES and a major oversight role is played by the Scientific Authority and the Management Authority of each State Party to CITES in ensuring that the licensing scheme works in practice. Vitally, the Scientific Authority considers that "the export of specimens of any such species should be limited in order to maintain that species throughout its range at a level consistent with its role in the ecosystems in which it occurs and well above the level at which that species might become eligible for inclusion in Appendix I."[157] It shall advise the Management Authority to limit the grant of export permits.

Particularly important from the perspective of this study is the concept of *introduction from the sea*, which as seen above means the transportation into a State of specimens of

[144] Ibid. Article 2 (3).
[145] Ibid. Article 3.
[146] Ibid. Article 3 (2).
[147] Ibid. Article 3 (3).
[148] Ibid. Article 3 (4).
[149] Ibid. Article 1(e).
[150] Ibid. Article 4 (2), (3).
[151] Ibid. Article 4 (4).
[152] Ibid. Article 4 (5).
[153] Ibid. Article 4 (6), (7).
[154] Ibid. Article 5 (2).
[155] Ibid. Article 5 (3).
[156] Ibid. Article 5 (4).
[157] Ibid. Article 4(3).

any listed species taken in the marine environment beyond national jurisdiction.[158] In relation to this particular issue, there is a need for cooperation between States and relevant Regional Fisheries Management Organisations and Arrangements (RFMO/A) when issuing certificates of introduction from the sea, as well as to address export and import permits for specimens taken in ABNJ.[159] Within this framework, if a vessel on the high seas takes specimens listed on CITES Appendices and delivers them to the same country in which it is flagged, this operation will need an introduction from the sea certificate, given that there is only one State involved. However, if there are more than one States involved, and for example a vessel delivers the specimens to another country, CITES Parties will treat this transaction as an export and it requires the issuance of an export permit by the country to which the harvesting vessel is flagged.[160]

Similar to many environmental treaties, CITES depends upon national regulatory authorities to give effect to its provisions, and each Contracting Party has to designate the aforementioned Management and Scientific Authorities, which have the competence and are involved in the process to grant permits or certificates.[161] In addition, for its enforcement CITES depends on, *inter alia*, working inspection and border controls to ensure that imports and exports of listed species comply with the required permits,[162] including the specific elements on format and contents set down in the Convention.[163] As a rule and a matter of practice, permits have a six-month validity period from the date on which they were granted.[164] Trade of listed species is allowed with States that are not Party to CITES provided comparable documentation pertaining to export, import or re-export permits are issued by the competent national authorities.[165] CITES also has some exemptions and special provisions in relation to trade.[166] Thus, for example, permits are not required for transit or transhipment of

[158] Ibid. Article 1(e), Article 3(5), Article 4(6)-(7)IV provide a framework to regulate the introduction from the sea of specimens of species included in Appendices I and II, respectively. For further details see also Resolution Conf. 14.6 (Rev. CoP16). Available at: https://cites.org/eng/res/14/14-06R16.php
[159] CITES. Resolution Conf. 14.6 (Rev. CoP16). Recital 6.
[160] U.S. Department of Commerce, National Oceanic and Atmospheric Administration. 'CITES: Introduction from the Sea.' See also: F. Meere, G. Geen, Q. Hanich, M. Lack, G. Sant, M. Tsamenyi (2008) 'CITES introduction from the sea, a practical way forward,' *TRAFFIC Bulletin Vol. 21(3)*.
[161] Ibid. Article 9.
[162] Sands, Peel, above n 141, 472.
[163] Ibid. Article 6.
[164] Ibid. Article 6 (2).
[165] Ibid. Article 10.
[166] Ibid. Article 7.

specimens through or in the territory of a Party while they remain in the control of customs,[167] or in the case of non-commercial loan, donation or exchange between scientists or scientific institutions.[168] The latter is typical of exemptions that apply to such institutions under international environmental Treaties.

CITES is very much dependent on good State practice to ensure an effective regime in so far as Parties are called upon to take appropriate measures to enforce the Convention's provisions and to prohibit trade in specimens that are in violation thereof.[169] National measures must penalize trade or possession of such specimens,[170] as well as the confiscation or return to the State of export of specimens. Also, Parties must ensure that specimens pass through the trade required formalities with a minimum of delay[171] and are properly cared for with a view to minimizing the risk of injury, damage to health or cruel treatment.[172] Moreover, Parties are allowed to introduce stricter domestic measures regarding the conditions for trade, taking, possession or transport of specimens of species included in Appendices I, II and III, or to prohibit trade completely.[173]

The institutional framework underpinning the Treaty is typical of international environmental treaties in as much as CITES has established a Conference of the Parties[174] and a Secretariat.[175] Importantly, the latter is able to execute compliance measures with the Management Authority of a Party that has not been implementing the trade provisions of the Convention, and consequently adversely affecting the listed species.[176] The final provisions in CITES address the rules on the amendments of the Appendices[177] and the Convention,[178] its relationship with domestic legislation and international Conventions[179] and dispute resolution.

[167] Ibid. Article 7 (1).
[168] Ibid. Article 7 (6).
[169] Ibid. Article 8.
[170] Ibid. Article 8 (1).
[171] Ibid. Article 8 (3).
[172] Ibid.
[173] Ibid. Article 14.
[174] Ibid. Article 11.
[175] Ibid. Article 12.
[176] Ibid. Article 13 (1).
[177] Ibid. Articles 15, 16.
[178] Ibid. Article 17.
[179] Ibid. Article 14.

To conclude, there are many positive features in CITES, which is in many respects one of the most effective regulatory structures for the protection of biodiversity since it provides sanctions for non-compliance and reporting obligations regarding the progress made with its administrative system. This enables the Secretariat to receive and circulate information vital to the detection of the illegal movement of illegal specimens.[180] The large number of Contracting Parties demonstrates its almost universal acceptance.[181] In addition, it is innovative and inclusive with a prescribed active role for NGOs in the overseeing monitoring and ensuring compliance, which in turn has been crucial for the success of the Convention.[182] On the other hand, it should also be noted that opinions are divided about the effectiveness of CITES in achieving its ambitious objectives,[183] and some consider that it has limited practical success given the toleration of major exceptions which provide loopholes for illegal trade, practical difficulties of enforcement,[184] as well as the non-binding nature of Conference Resolutions.[185] Nonetheless, some expert reports have highlighted the effectiveness of CITES in protecting aspects of the marine and terrestrial environment, such as the iconic species of hammerhead shark, which is an Annex II species, on the grounds that it is improbable that a Scientific Authority could conclude that exporting such species for consumption is possible without endangering the survival of the species.[186] For Annex II species, it may be recalled that a "non-detriment finding" of a Scientific Authority is required before trade is permitted. There are other shortcomings in relation to the CITES approach in so far that it is not possible or practical to list aspects of the deep-sea biodiversity for protection under the strict list system advanced by CITES.

[180] Birnie, Boyle, Redgwell, above n 25, 688.
[181] Ibid. 685.
[182] Ibid. 687.
[183] Ibid. 688.
[184] Ibid.
[185] Ibid.
[185] Ibid. 690.
[186] Consejo de Representantes de Autoridades Científicas CITES de Costa Rica (CRACCITES - Costa Rica). 28 marzo, 2017. Dictamen de Extracción No Perjudicial (DENP) para el tiburón martillo común (*Sphyrna lewini*) y las dos especies semejantes (*S. zygaena* y *S. mokarran*) de Costa Rica, incluidas bajo el Apéndice II de la Convención Sobre el Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestres (CITES). San José, Costa Rica. See similar argument in relation to European eels: H. Wickström, Non-detriment Findings for the European eel - the Swedish Case. Available at: https://cites.org/sites/default/files/ndf_material/WG8-CS2-S.pdf

3.5 BIODIVERSITY WITHOUT BORDERS: THE CONVENTION ON MIGRATORY SPECIES

As noted in chapter 2, the CRD is a vital migration and feeding area for migratory species such as the blue whale (*Balaenoptera musculus*), the leatherback sea turtle (*Dermochelys coriacea*), as well as the short-beaked common dolphin (*Delphinus delphis*). In this context, it is important to point out that the Convention on the Conservation of Migratory Species of Wild Animals[187] (hereafter, CMS) aims to protect migratory species,[188] which are defined therein as the 'entire population of any species of wild animals whose members cyclically and predictably cross one or more national jurisdictional boundaries.'[189] Costa Rica and one of its neighbouring coastal States in Central America are Parties to CMS.[190] Despite this low level of participation, the scheme of conservation and management provided by the CMS is thus clearly pertinent to the protection of the unique biodiversity associated with CRD in so far as it requires the concerted action of all States in which such species spend any part of their life cycle.[191]

More specifically, and similarly to CITES, the CMS addresses management and conservation measures through an Appendix approach, which requires States Parties to this Convention to adopt and implement the following objectives: a) promote, cooperate and support research on migratory species; b) provide immediate protection for migratory species included in Appendix I; and c) conclude Agreements covering the conservation and management of migratory species included in Appendix II.[192] Examples of Appendix I and II marine species that migrate through the CRD include the blue whale and leatherback turtles (Appendix I), and hammerhead sharks and other

[187] Convention on Migratory Species. 1651 UNTS 333. Entered into force 1 on November, 1983. See note 8. For commentary, see, *inter alia*: M. Bowman, P. Davies, C. Redgwell, *Lyster's International Wildlife Law and Policy* (2010, 2nd ed.), Chapter 16 ('The Convention on the Conservation of Migratory Species'); L. Glowka (2000) 'Complementarities between the CMS and CITES', 3 *Journal of International Law and Policy*, Vol. 3, 205; S. Lyster (1989) 'The Convention on the Conservation of Migratory Species of Wild Animals', *Natural Resources Journal*, Vol. 29, 979.
[188] Tanaka, above n 1, 337.
[189] CMS. Article 1.
[190] Costa Rica (1 August 2007) and Honduras (1 April 2007) are the only two countries in the CRD area Parties to CMS.
[191] CMS. Recital 6.
[192] Ibid. Article 2.

elasmobranchs (Appendix II).[193] In addition, the Convention develops key concepts like the 'Range State', which includes countries in whose lands or waters a species occurs.[194] Moreover, for migratory marine species whose range includes ABNJ, CMS tools include flag vessel jurisdiction, where a CMS Party is considered a Range State for these species when its flag vessels 'take' the species in ABNJ. Parties are required to report on their flag vessels when they engage in taking or are planning to take the species that come within the scope of CMS.[195]

Furthermore, countries which are Party or not to CMS are required to cooperate with the conservation, restoration of habitats and prevention of adverse effects on the migration of migratory species.[196]

Importantly, a difference in the method of protecting species adopted under the two Appendices is evident under the CMS,[197] where mandatory obligations are laid down in Appendix I, and Agreements are required in Appendix II. More specifically, in the case of endangered migratory species listed in Appendix I, Parties that are Range States must prohibit[198] the taking of such species, and shall conserve and restore its habitats, prevent or remove adverse activities or obstacles for the migration of the species, and control endangering factors to the species.[199] A migratory species may be removed from this Appendix when the Conference of the Parties, based on the best scientific

[193] Other species covered by CMS that migrate through the CRD are the following: sei whale *(Balaenoptera borealis);* fin whale *(Balaenoptera physalus);* blue whale *(Balaenoptera musculus);* humpback whale *(Megaptera novaeangliae);* sperm whale *(Physeter macrocephalus);* green sea turtle *(Chelonia mydas);* loggerhead sea turtle *(Caretta caretta);* hawksbill sea turtle *(Eretmochelys imbricate);* olive ridley sea turtle *(Lepidochelys olivacea);* leatherback sea turtle *(Dermochelys coriacea);* great white shark *(Carcharodon carcharias);* giant oceanic manta ray *(Manta birostris);* spinetail devil ray *(Mobula japonica);* Munk's devil ray *(Mobula munkiana);* Bryde's whale *(Balaenoptera edeni);* coastal spotted dolphin *(Stenella attenuate);* spinner dolphin *(Stenella longirostris);* striped dolphin *(Stenella coeruleoalba);* short-beaked common dolphin *(Delphinus delphis);* killer whale or Orca *(Orcinus orca);* whale shark *(Rhincodon typus);* shortfin mako shark *(Isurus oxyrinchus);* longfin mako shark *(Isurus paucus);* pelagic thresher *(Alopias pelagicus);* bigeye thresher *(Alopias superciliosus);* common thresher *(Alopias vulpinus);* silky shark *(Carcharhinus falciformis);* scalloped hammerhead *(Sphyrna lewini);* great hammerhead *(Sphyrna mokarran)*. CMS. Appendices I and II.

[194] Range means all the areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route. CMS. Articles 1 (1.f), 6.

[195] CMS. Factsheet: Migratory Marine Species in areas beyond the limits of national jurisdiction. Available at: http://www.cms.int/es/node/7413, 1.

[196] CMS. Article 5 (2).

[197] Birnie, Boyle, Redgwell, above n 25, 681.

[198] Exceptions to this prohibition are listed in CMS Article 3(5).

[199] CMS. Article 3.

evidence, determines that it is no longer endangered.[200] To date, the blue whale as well as other cetaceans, and the leatherback turtle are species associated with the CRD are included in Appendix I.[201] No CRD migratory species have however been removed from the list.

In regards to migratory species with an unfavourable conservation status listed in Appendix II, international Agreements[202] to address conservation and management need to be adopted and implemented. Specifically, Parties that are Range States are called upon to conclude Agreements to benefit such species, as well as populations of species that periodically cross one or more national jurisdiction boundaries.[203] Guidelines[204] for the Agreements are set out in the Convention to ensure a uniform approach to develop management and conservation measures in relation to migratory species listed in Appendix II. The restoration to a favourable conservation status of such migratory species is the main objective of the Agreements,[205] and these instruments should be open to accession by all Range States of the species, whether or not Parties to the Convention. In addition, the Agreement should describe the features of the species, the national machinery to assist its implementation,[206] the coordinated conservation management plans (including procedures to suppress illegal taking), as well as provide for research and exchange of information.[207] As noted in one commentary, the success of the Convention depends on the conclusion of such Agreements.[208] Moreover, species may be listed in both Appendices[209] even if they are already within the scope of other relevant multilateral instruments, including fishery or marine mammal Treaties.[210] However, if Parties of these Conventions are simultaneously Parties to CMS, and plan to conclude Agreements, it will be necessary to establish if other instruments provide for the adoption of stricter regional measures.[211]

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[200] Ibid. Article 3(3).
[201] Appendices I and II of the Convention on the Conservation of Migratory Species of Wild Animals. Effective: 8 February 2015. Available at: http://www.cms.int/sites/default/files/document/Appendices_COP11_E_version5June2015.pdf
[202] Guidelines for the Agreements are indicated in CMS Article 5.
[203] CMS. Article 4.
[204] Ibid. Article 5.
[205] Ibid. Article 5(1).
[206] Ibid. Article 5(4).
[207] Ibid. Article 5(5).
[208] Birnie, Boyle, Redgwell, above n 25, 681.
[209] CMS. Article 4 (2).
[210] Birnie, Boyle, Redgwell, above n 25, 681.
[211] Ibid. 682.

In relation to ABNJ, the CMS provides a legal basis to address the conservation and management needs of species of wild animals migrating across or outside national jurisdictional boundaries.[212] Moreover, conservation strategies need to focus on the holistic and integrated management of species as well as to their habitats and migratory routes.[213] In this regard, a CMS CoP Resolution[214] emphasizes the relevant role of trans-boundary area-based conservation measures, including ecological networks of protected and other management areas, in improving the conservation status of migratory species and promoting connectivity among areas within and beyond national jurisdiction. The Resolution also links the CMS framework of action with the BBNJ negotiation process,[215] which will be analysed in chapter 8. In addition, a set of recommendations[216] for further advancing the design and implementation of ecological networks to address the needs of migratory species, agreed within this Resolution, include elements such as: defining network objectives, ensuring that networks have a sufficiently holistic scope, ensuring the functional benefits of connectivity, design factors, assessing risks, knowledge, engagement and the implementation regime.[217]

Finally, it ought to be borne in mind that the Convention establishes three institutional bodies: the Conference of the Parties,[218] the Scientific Council,[219] and the Secretariat.[220] Likewise, amendments to the Convention[221] and the Appendices[222] are addressed specifically in the final provisions of CMS, including matters concerning dispute settlement[223] and the relationship of the Convention with other international instruments.[224]

The overall importance of CMS for protecting marine biodiversity in Central America should not be underestimated. Notably, as mentioned in chapter 2, the CRD is a

[212] CMS. Recital 4.
[213] S. Bache (2003) 'Marine wildlife by-catch under the CMS: Progress and prospects,' *The International Journal of marine and coastal Law*. Vol 18(2), *passim*.
[214] UNEP/CMS/Resolution 11.25. Advancing ecological networks to address the needs of migratory species. CoP 11, Quito 4-9 November, 2014.
[215] Ibid. Para 19, 5.
[216] Ibid. Annex to Resolution 11.25. 6.
[217] Ibid. 7-8.
[218] CMS. Article 7.
[219] Ibid. Article 8.
[220] Ibid. Article 9.
[221] Ibid. Article 10.
[222] Ibid. Article 11.
[223] Ibid. Article 13.
[224] Ibid. Article 12.

migratory path or corridor used by many highly migratory species, such as the blue whale, leatherback turtles, sharks and other marine predators,[225] several of which have been included in the Appendices of CMS.[226] Particularly important in this context of the unique biodiversity associated with the CRD is the prohibition under CMS of any taking or capture of migratory species such as cetaceans.[227] Furthermore, the scheme of protection is very much focused on species that face extinction (Appendix I) and mandatory obligations, along with species listed in Appendix II which merit further international cooperation on conservation measures. There are positive and negative features to regional progress in implementing obligations arising under CMS and related instruments. On the one hand, at the time of writing, no International Agreements under CMS have been concluded in relation to species that migrate too and from the CRD. On the other hand, a memorandum of understanding on the conservation of migratory sharks was signed by Costa Rica in 2010.[228] The effectiveness of the latter MoU is of course entirely dependent upon the action and the goodwill of the Range States.

As pointed out previously, many migratory species protected under CMS provide direct and indirect incomes to coastal communities, [229] thereby supporting subsistence livelihoods in Central America. [230]At the same time, it also needs to be emphasized that the repeating cycles and trans-boundary ranges inherent to the migration of these species, as well as the need of cooperation and coordinated actions represent a challenge for the countries in the Central American Region, given their limited capacities to adopt and implement effective marine conservation measures.[231] Indeed with a view to improving the *status quo*, there is a pressing need for meaningful engagement by all interested stakeholders in the implementation of the obligations that arise under the CMS and related Agreements. Furthermore, the *Strategic Plan for*

[225] L. T. Ballance; R. L. Pitman; P. C Fiedler (2006) 'Oceanographic influences on seabirds and cetaceans of the Eastern Tropical Pacific: A review,' *Progress in Oceanography*, Vol. 69(2), 360.
[226] See note 8.
[227] CMS. Article 5(4).
[228] Ibid. Memorandum of Understanding on the Conservation of Migratory Sharks. Signatories and Range States. Available at: http://www.cms.int/sharks/en/signatories-range-states
[229] E. Hoyt, M. Iñíguez (2008 *The State of Whale Watching in Latin America*. WDCS, Chippenham, UK; IFAW, Yarmouth Port, USA; and Global Ocean, London, 60.
[230] Center for Ocean Solutions (2009). *Pacific Ocean Synthesis: Scientific Literature Review of coastal and ocean threats, impacts, and solutions*. The Woods Center for the Environment, Stanford University. California, 42.
[231] UNEP (2010) *Latin America and the Caribbean Environment Outlook: GEO LAC 3*. UNEP, Panama. 312.

Migratory Species (2015-2023),[232] which has built upon the CBD Aichi Targets, establishes conservation goals and targets which entails relevant actions that could be implemented in the CRD, such as the adoption of a migratory systems approach;[233] the reduction of direct pressures on migratory species and their habitats;[234] and the identification of key habitats and the establishment of area-based conservation measures.[235]

Finally, at a global level, the CMS has made significant progress in listing new species in Appendix I and in concluding separate Agreements for species in Appendix II, although progress in the latter has been time-consuming.[236] In regards to cooperation between Multilateral Environmental Agreements, the CMS Secretariat has Joint Work Plans with CITES[237] and plans to expand synergies with the CBD and Ramsar Secretariats.[238]

3.6 MULTILATERALISM AND THE CONSERVATION OF OCEAN GIANTS: THE INTERNATIONAL CONVENTION FOR THE REGULATION OF WHALING

The International Convention for the Regulation of Whaling[239] (hereafter, ICRW) was adopted in 1946 to protect whales and avoid over-fishing,[240] manage human pressures on a limited number of commercially exploited whale species and restore population levels to ensure the continuity of the commercial whaling industry.[241] Ostensibly the ICRW provides a framework for the development and management of the whaling

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[232] CMS. *The Strategic Plan for Migratory Species 2015-2023*. Available at: http://www.cms.int/sites/default/files/document/Res_11_02_Strategic_Plan_for_MS_2015_2023_E_0.pdf
[233] Ibid. Goal 3. Target 9.
[234] Ibid. Goal 2. Target 5.
[235] Ibid. Goal 3. Target 10, Goal 4. Target 11.
[236] D. G. Victor, K. Raustiala, E. B. Skolnikoff (eds.), *The implementation and effectiveness of international environmental commitments: Theory and practice*. (Cambridge: MIT Press, 1998).
[237] UNEP/CMS/StC42/Doc.6.1 . Cooperation between CMS and CITES.
[238] UNEP/CMS/StC44/4.1. 3.
[239] International Convention for the Regulation of Whaling. 161 UNTS 72. Entered into force on 10 November, 1948. See note 9. See also: Whaling in the Antarctic Case (*Australia v Japan: New Zealand intervening*), Judgment of the International Court of Justice, General List No. 148 (31 March 2014); and M. J. Bowman (2008) 'Normalizing the International Convention for the Regulation of Whaling' *Michigan Journal of International Law*, Vol. 29, 293.
[240] ICRW. Recital 3.
[241] A. Proelss, K. Houghton, 'Protecting marine species' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 243.

industry and only later concerned itself with conservation measures in response to the mass killing of whales to extinction.[242] This shift in emphasis towards conservation and away from utilization has been strongly resisted by Japan, Norway, Iceland and to a lesser degree the Russian Federation. The ICRW is subject to detailed analysis in the specialist literature and only the briefest of summaries is presented here.[243]

At the outset of our discussion, it ought to be kept in mind that a diverse range of great whales migrate and feed in the CRD area, including the blue whale *(Balaenoptera musculus)*, fin whale *(Balaenoptera physalus)*, sei whale *(Balaenoptera borealis)*, common minke whale (*Balaenoptera acutorostrata*), humpback whale *(Megaptera novaeangliae),* sperm whale *(Physeter macrocephalus),* and the Bryde's whale (*Balaenoptera edeni*). Most notably, as noted previously in chapter 2, the blue whale is on the IUCN endangered species list due to over-exploitation and has been protected since 1986.[244] Furthermore, the close association of the CRD with the spatial distribution of blue whale and other cetaceans is the subject of a number of scientific studies and underscores the importance of international conservation measures and the moratorium on commercial exploitation under the ICRW more specifically.[245]

Apart from Honduras and El Salvador, the rest of the Central American coastal States are Party to the ICRW and this is the main instrument for the regulation of whaling and related activities in the CRD.[246] The Convention's material scope is extensive and applies to factory ships, land stations and whale catchers under the jurisdiction of Contracting Parties, and its geographical scope includes all the waters in which whaling is prosecuted by such factory ships, land stations and whale catchers.[247] As is well known, however, the initial efforts of Contracting Parties under the ICRW to safeguard the stocks of large whales and to ensure sustainable exploitation were not achieved in the 1960 and 1970, and the adoption of a complete ban on commercial

[242] See, A. Gillespie, *Whaling Diplomacy*: *Defining issues in International Environmental Law* (Cheltenham: Edgar Elgar, 2005).
[243] In particular, see: M. Fitzmaurice, *Whaling and International Law* (Cambridge: CUP, 2015).
[244] S. B. Reilly, et. al., The IUCN Red List of Threatened Species. *Balaenoptera musculus*. 2008. Available at: http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T2477A9447146.en
[245] H. Bailey, et al., (2009) 'Behavioural estimation of blue whale movements in the Northeast Pacific from state-space model analysis of satellite tracks', *Endangered Species Research,* Vol. 10, 93-106.
[246] ICRW. Membership and Contracting Governments. Available at: https://iwc.int/members
[247] ICRW. Article 1 (2).

whaling was first adopted in 1982.[248] The moratorium became effective during the 1985-1986 whaling season and remains in force at the time of writing.[249] Since then, the stocks of blue whale have recovered and the ICRW provides the primary conservation regime for protection and preservation of whales in the CRD. In addition, measures adopted by coastal State within the region prohibiting whaling are complemented by trade measures.[250]

The structure and procedures established under the ICRW have a major bearing on conservation measures, which apply to CRD. In particular, an important milestone was passed under the Convention with the establishment of the International Whaling Commission (hereafter, IWC),[251] which discharges many regulatory and administrative functions, such as to recommend or organize studies and investigations on whales and whaling,[252] collect and analyse statistical information concerning whale stocks,[253] and the dissemination of information.[254] Furthermore, the Commission adopts provisions on the conservation and utilization of whale resources,[255] detailed in the Schedule as an integral part of the ICRW.[256] These provisions also include interpretations of species,[257] classification of whale stocks,[258] fixing protected and unprotected species,[259] open and closed seasons[260] and waters, including the designation of sanctuary areas,[261] size limits for each species,[262] time, methods and intensity of whaling, including maximum catches per season,[263] types and specifications of allowed gears and appliances,[264] supervision and control measures,[265] among other provisions. Importantly, the amendment of these regulations requires a three quarters majority of member voting in

[248] Ibid. Article V (1)(e) in conjunction with Rule 10 (e) of the ICRW Schedule.
[249] Proelss, Houghton, above n 241, 243.
[250] See for example: Fisheries & Aquaculture Law in Costa Rica, article 39.
[251] ICRW. Article 3.
[252] Ibid. Article 4.1 (a).
[253] Ibid. Article 4.1 (b).
[254] Ibid. Article 4.1 (c).
[255] Ibid. Article 5.
[256] Ibid. Article 1 (1).
[257] Ibid. Schedule (I).
[258] Ibid. Schedule (II), (III).
[259] Ibid. Article 5 (a).
[260] Ibid. Article 5 (b).
[261] Ibid. Article 5 (c).
[262] Ibid. Article 5 (d).
[263] Ibid. Article 5 (e).
[264] Ibid. Article 5 (f).
[265] Ibid. Schedule (V).

favour of the proposal.[266] Moreover, the amendments of the Schedule must be based on scientific findings[267] and they become effective 90 days following the notification by the Commission to the Contracting Parties.[268]

In addressing these legal options within the Schedule, two whale sanctuaries[269] have been created by the International Whaling Commission: the Indian Ocean Sanctuary (IOS) in 1979 (renewed in 2002), and the Southern Ocean Sanctuary (SOS) in 1994. [270] Commercial whaling is prohibited in both sanctuaries. A proposal to establish a sanctuary in the South Pacific failed to receive the requisite support from Contracting Parties to amend the Schedule for this purpose.[271] Although this initiative would not have extended in geographical scope to the Eastern Tropical Pacific, it demonstrated the challenges that may well be encountered if a similar proposal is brought forward in relation to the establishment of a sanctuary that applies specifically to the CRD. The South Pacific sanctuary proposal, which was tabled at the IWC by Australia and New Zealand, was aimed at protecting whales during their entire migration and life cycles, between feeding in the Antarctic and calving in the tropics.[272] Significantly, Costa Rica and Mexico [273] have established national whale sanctuaries in their EEZs. [274] Furthermore, as seen in chapter 2, whale watching is a significant coastal tourism in Costa Rica.[275]

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[266] Ibid. Article 3 (2).
[267] Ibid. Article 5 (2.b).
[268] Ibid. Article 5 (3).
[269] M.A. Zacharias, L. R. Gerber, K. D. Hyrenbach (2006) 'Review of the Southern Ocean Sanctuary: Marine Protected Areas in the context of the International Whaling Commission Sanctuary Programme.' *J. CETACEAN RES. MANAGE, Vol.* 8(1), 1. See also: E. Morgera (2004) 'Whale Sanctuaries: An evolving concept within the International Whaling Commission,' *Ocean Development and International Law*, Vol. 35, 319.
[270] An additional proposal for a Sanctuary in the South Atlantic Ocean (IWC/66/08) has been repeatedly submitted to the IWC, however it has not achieved the ¾ majority of votes required to amend the Schedule. Report of the 65th Meeting of the International Whaling Commission and associated meetings and workshops. Available at: https://archive.iwc.int/pages/search.php?search=%21collection24440&k 12.
[271] Ibid.
[272] Ibid.
[273] The Whale Sanctuary of El Vizcaino, located in the Pacific Coast of Mexico's Baja California Peninsula, was recognized internationally under the UNESCO Man and the Biosphere Programme in 1993. UNESCO- World Heritage Centre List. Available at: http://whc.unesco.org/en/list/554
[274] See Costa Rican Executive Decree Nº 34327-MINAE-MAG. Available at: http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=62657&nValor3=71665&strTipM=TC
[275] Chapter 2, *ante*.

Currently, just Norway and Iceland engage in whaling for commercial purposes, relying either on the objection to the moratorium decision, or under the reservations that they have lodged to it.[276] In addition, Japan justified whaling activities under the scientific whaling exemption[277] in accordance to article VIII (1) of the ICRW. However, the International Court of Justice (ICJ) addressed these activities in the *Whaling in the Antarctic case*,[278] which arose as a result of Australia instituting proceedings against Japan concerning Japan's JAPRA II whaling programme and potential breaches of the ICRW.[279] In this particular case, the ICJ concluded that the special permits granted by Japan for the killing, taking and treating of whales in connection with JAPRA II were not for purposes of scientific research,[280] thus violating Japan's compliance with the moratorium.[281]

In regards to enforcement, the prosecution for infringements of the Convention is instituted by the Government having jurisdiction over the offence,[282] which is also obliged under the Convention to transmit to the Commission details of each infraction by persons or vessels under the jurisdiction of that Government.[283] An additional instrument was developed within the ICWR framework: the Protocol to the International Convention for the Regulation of Whaling.[284] The Protocol extends the application of the Convention to helicopters and other aircrafts to be subject to the provisions on methods of inspection.[285] Subsequently, the Protocol amended the definition of whale catcher, broadening it to mean a helicopter or other aircraft, or a ship, used for the purpose of hunting, taking, killing, towing, holding on to, or scouting for whales.[286]

Finally, in regards to the implementation of the Convention's provisions, the main outcomes of the 65th Meeting of the International Whaling Commission highlighted a

[276] ICWR. Schedule amended by the Commission at the 65th Meeting Portorož, Slovenia, September 2014.
[277] Proelss, Houghton, above n 241,244.
[278] Whaling in the Antarctic (Australia v. Japan, New Zealand Intervening). See note 239.
[279] Proelss, Houghton, above n 241,244.
[280] Whaling in the Antarctic (Australia v. Japan, New Zealand Intervening). See note 239, para. 227.
[281] Rothwell, Oude Elferink, Scott, Stephens, above n 1, 511.
[282] ICRW. Article 9(4).
[283] Ibid. Article 9(3).
[284] Protocol to the ICRW.
[285] Ibid. Recital 1.
[286] Ibid. Article 2(3).

common problem within multilateral instruments, the failure of Contracting Parties to reach consensus on specific resolutions. In this regard, a proposed Schedule amendment to create a South Atlantic Whale Sanctuary was not adopted;[287] but a Resolution on highly migratory species was adopted, seeking for enhanced collaboration from coastal States and other competent organisations on concerted additional conservation efforts and actions on the high seas and the conservation of migratory cetaceans, [288] such as well-established communication mechanisms and databases on cetaceans (ship strike database, work on ship strikes, regional networking, increase engagement with the maritime sector).[289]

As seen above, the ICRW is not the only Convention concerned with whaling and the protection of marine mammals as CITES prevents and controls international trade in endangered species. Furthermore, the Buenos Aires Group,[290] in which Costa Rica is a strong and active member, has taken a strong stance at the IWC annual meetings, in particular during the IWC meeting in 2014, as noted by the Centro de Conservación Cetácea in their assessment:

> Perhaps the only positive side of this disturbing meeting was the courageous position of countries like Chile, Colombia, Costa Rica, Ecuador and the Dominican Republic, which despite the strong pressure received from New Zealand and various northern hemisphere NGOs to support this misleading proposal, they all remained consistent with the policies promoted by the Grupo Buenos Aires (Latin American countries in the IWC) which include, among others, a permanent commitment to the maintenance of the moratorium on commercial whaling and integrity of whale sanctuaries. These Latin American nations, along with other Buenos Aires Group members and small NGOs, are the ones who deserve to be recognized and strengthened in the future to continue

[287] IWC (2016) *Report of the 65th Meeting of the International Whaling Commission*. Cambridge, UK: IWC, 1.
[288] Ibid. 14. Monaco introduced a Resolution on Highly Migratory Cetaceans, which emphasised that a large number of cetacean species are not currently covered by IWC management measures, and urging for enhanced collaboration between relevant organisations and frameworks such as IMO, the Convention for Migratory Species and the United Nations Convention on the Law of the Sea. On the other hand, Japan and the Republic of Korea were strongly in favour of regional management in these cases and didn't support the draft Resolution. See also: IWC Resolution 2014-2.
[289] Ibid.
[290] IWC, see above n 287, 11. The 'Buenos Aires Group' comprises: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Panama, Peru and Uruguay.

leading the defence and conservation of whales in the 21st century.[291]

However, some challenges have arisen in regards to small cetaceans, and some countries like Costa Rica, Spain, Japan and Chile, among others, have indicated their reservations on the Commission's competence in relation to these species.[292] The main argument has been that the Commission's membership is small, and taking this responsibility would be difficult. [293] In this context, the IWC attempted to promote "a cooperative dialogue with relevant States"[294] that are not members of the IWC, but have small cetaceans in their waters. In addition, a funding mechanism was established during the 1990s to facilitate the participation of coastal States on relevant small cetacean discussions. [295]

Clearly cetaceans are an important component of the biodiversity associated with the CRD. Thus, it is regrettable to note that the shortcomings of the ICRW are well documented in the specialist literature and include poor governance structures, inadequate dispute resolution mechanisms and its focus on the management of whale stocks for exploitation.

3.7 PRAGMATISM AND PRINCIPLE: APPLYING THE WORLD HERITAGE CONVENTION TO THE CRD

The 1972 Convention concerning the Protection of the World Cultural and Natural Heritage[296] articulates the significant duty of the international community[297] as a whole

[291] E. Cabrera (2014) *International Whaling Commission: Why the Whales Lost*. Centro de Conservación Cetácea. Available at: http://www.ccc-chile.org/articulo-48-1146-100614_international_whaling_commission_2014_why_the_whales_lost.html

[292] IWC (1983) *Thirty-Third Report of the International Whaling Commission*. Cambridge, UK: IWC, 26, 30. See also: IWC (1990) *Fortieth Report of the International Whaling Commission*. Cambridge, UK: IWC, 22. See also: A. Gillespie (2001) 'Small Cetaceans, International law and the International Whaling Commission,' *Melbourne Journal of International Law*, Vol. 12(2), 257.

[293] IWC (1992) *Forty-Second Report of the International Whaling Commission*. Cambridge, UK: IWC, 16.

[294] IWC (1993) *Forty-Third Report of the International Whaling Commission*. Cambridge, UK: IWC, 36.

[295] IWC (1994) *Forty-Fourth Report of the International Whaling Commission*. Cambridge, UK: IWC, 31. Resolution on Addressing Small Cetaceans in the IWC. See also: IWC (1996) *Forty-Sixth Report of the International Whaling Commission*. Cambridge, UK: IWC.

[296] Convention concerning the Protection of the World Cultural and Natural Heritage. 1037 UNTS 151. Entered into force on 17 December, 1975. For commentary, see, inter alia: F. Francioni, F. Lenzerini, *The 1972 World Heritage Convention: A commentary* (Oxford: Oxford

to cooperate and participate in the protection of the cultural and natural heritage of outstanding universal value.[298] The Convention's material scope is very broad in so far as natural heritage[299] encompasses three main elements: natural features, geological and physiographical formations, along with natural sites. The protection of heritage embraces the establishment of a system of international cooperation and assistance, which is designed to support States Parties in their efforts to identify and conserve appropriate sites that are designated for this purpose under the scheme established by the Convention.[300] The Convention has long since been applied to protect terrestrial and coastal sites such as the unique biodiversity and ecosystems associated with Area de Conservación Guanacaste in the Northwest of Costa Rica.

In regards to the Convention's geographical scope, Dr. Freestone and others have pointed out that there are no elements within the scheme of the Convention which suggest that natural or cultural heritage found in marine ABNJ should be excluded from the protection regime set out therein.[301] Indeed, it is evident that neither the definitions of the terms of natural or cultural heritage restricts the application of the Convention to areas within the national territory of States Parties.[302] On the other hand, it ought to be noted that there are some provisions, specifically in relation to the nomination process of World Heritage sites, which include references to sites *situated on the territory* of States Parties.[303] Supporting a broader application of the Convention, it should be borne in mind the absence of widespread knowledge of the extent of marine habitats and species in ABNJ at the time the Convention was negotiated.[304] Clearly, this is no longer the case, as is evident from the discussion of the unique biodiversity associated with the CRD as seen in chapter 2. Furthermore, it needs to be noted that UNESCO has adopted a specific Convention that aimed at the protection of underwater cultural heritage, which is limited in material application to traces of human existence that are

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University Press, 2008); M. Albert, B. Ringbeck, *40 Years World Heritage Convention. Popularizing the Protection of Cultural and Natural Heritage* (Boston: De Gruyter, 2015).

[297] As of March 2016 it has 191 Parties and is thus nearly universally ratified. See also: D. Freestone, D. Laffoley, F. Douvere, T. Badman (2016) *World Heritage in the High Seas: An Idea Whose Time Has Come*. Paris: UNESCO, 45.

[298] World Heritage Convention (hereafter, WHC). Recital 7, article 6.

[299] Ibid. Article 2.

[300] Ibid. Article 7.

[301] Freestone, Laffoley, Douvere, Badman, above n 297, 46.

[302] Ibid.

[303] Ibid. 47.

[304] Ibid.

underwater and have a cultural or historical character.[305] Accordingly, it appears counter intuitive to limit the geographical scope of the 1972 Convention to areas within coastal State jurisdiction.

In relation to its site protection regime, the 1972 Convention recognizes the duty of States Parties to ensure the identification, protection, conservation, presentation and transmission of cultural and natural heritage for future generations.[306] Moreover, with a view to ensuring effective and active measures, Parties are obliged to adopt general policies to integrate the protection of that heritage into comprehensive planning programmes,[307] set up services for the protection of the cultural and natural heritage,[308] develop scientific and technical studies,[309] and take appropriate legal, scientific, technical, administrative and financial measures for the identification and conservation of this heritage.[310] This scheme is both prescriptive and effective as is evident from the success of the Convention in protecting terrestrial heritage.[311]

The institutional framework under the Convention entailed the establishment of the World Heritage Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value.[312] The Committee receives[313] and studies requests[314] for international assistance formulated by States Parties with respect to cultural or natural heritage. In addition, the World Heritage List[315] and the List of World Heritage in Danger[316] were established under the Convention. Taking into account this approach, the Convention offers a reactive monitoring system to review the deteriorating conditions of heritage sites.[317] In light of this approach, the List of World Heritage in

[305] Convention on the Protection of the Underwater Cultural Heritage. 2562 UNTS 3. Entered into force on 2 January, 2009.
[306] WHC. Article 4.
[307] Ibid. Article 5 (a).
[308] Ibid. Article 5 (b).
[309] Ibid. Article 5 (c).
[310] Ibid. Article 5 (d).
[311] Some examples of success stories on the protection and restoration of terrestrial World Heritage sites are: the Giza Pyramids (Egypt), Angkor (Cambodia), the Old City of Dubrovnik (Croatia), the Royal Chitwan National Park (Nepal), among others. UNESCO World Heritage Center (2017) *Success stories*. Available at: http://whc.unesco.org/en/107/
[312] WHC. Article 8.
[313] Ibid. Article 13 (1).
[314] Ibid. Article 13(8). The Committee's decission shall be taken by a majority of two-thirds of its members present and voting.
[315] Ibid. Article 8 (3).
[316] Ibid. Article 8 (4).
[317] WHC Guidelines, n 135, IV.A

Danger could contribute to the protection of marine sites and action on the part of Contracting Parties in light of the on-going deterioration and the loss of natural features.[318]

Additionally, its important to highlight the complementary nature and interactions that occur between different international instruments that afford protection of species and habitats. In particular, there is an overlap between natural heritage sites that are listed on the World Heritage Lists and protected areas under the Ramsar Convention, as well as threatened marine species listed under the schemes established pursuant to CITES and CMS.[319] In the case of a number of terrestrial sites, the application of such instruments has been used to justify the designation of habitats as having outstanding universal value for conservation purposes under the 1972 Convention. Again, similar arguments could be made in relation to the future listing of the CRD on the World Heritage List and the author will return to this matter in the final chapter of this study.[320]

There are many practical elements in the Convention that are aimed at advancing effective cooperation within the international community as a whole. Specifically, the Convention provides a legal basis for the establishment of a funding mechanism to make feasible international assistance for cultural or natural heritage of Outstanding Universal Value (OUV) situated within the States Parties' territory and included in one of the Convention´s lists. [321] Assistance granted by the World Heritage Fund may cover: studies concerning technical problems raised by the protection and rehabilitation of the cultural and natural heritage,[322] training in the field of identification, protection and rehabilitation of the cultural and natural heritage,[323] and supply of equipment,[324] among others. Once the assistance is granted, the World Heritage Committee and the recipient State define an agreement with a programme or project conditions.[325] State Parties shall report on actions achieved, and on legislative and administrative provisions, which they have adopted for the application of this Convention.[326] This is an important

[318] Rothwell, Oude Elferink, Scott, Stephens, above n 1, 823.
[319] Proelss, Houghton, above n 241, 253.
[320] Chapter 9.
[321] WHC. Article 15(1).
[322] Ibid. Article 22(a).
[323] Ibid. Article 22(c).
[324] Ibid. Article 22(d).
[325] Ibid. Article 26.
[326] Ibid. Article 29.

mechanism and has contributed enormously to the success and effectiveness of the scheme of protection afforded by the Convention.

In regards to implementation and compliance, the legal regime set by the Convention has evolved, facilitating the development of interpretative criteria and the adaptation of its provisions to changing circumstances concerning site protection.[327] Most notably, the articulation of the Global Strategy for a representative, balanced and credible World Heritage List,[328] as well as the establishment of the UNESCO World Heritage Marine Programme,[329] were two considerable developments within the Convention's framework. Another key instrument is the *Bahrain Action Plan for Marine World Heritage,*[330] developed to ensure that marine areas of OUV were accorded equal attention to the protection of World Heritage on land.[331]

Currently, the UNESCO World Heritage List counts 47 marine sites located in 36 nations, which accounts for about 20 per cent of all marine protected areas measured by the extent of the surface area.[332] Some examples in Latin America include Cocos Island National Park (Costa Rica), Coiba National Park (Panama), Galapagos Islands (Ecuador), Malpelo Fauna and Flora Sanctuary (Colombia), Península Valdés (Argentina), among others. Another example of innovative approach to the interpretation of the Convention is the Operational Guidelines[333] agreed by the World Heritage Committee.[334]

In the broader context of protecting the unique biodiversity associated with the CRD, the importance of the creation of the UNESCO World Heritage Marine Programme should not be underestimated in so far as its overall objective to ensure that all marine

[327] Francioni, Lenzerini, above n 296, 6.
[328] UNESCO. Global Strategy for a representative, balanced and credible World Heritage List. (1994-2004).
[329] The World Heritage Marine Programme was established at the 29th session of the World Heritage Committee, held in 2005 in South Africa.
[330] D. Laffoley, J. Langley (eds.) (2010) *The Bahrain Action Plan for Marine World Heritage. Identifying priorities for marine World Heritage and enhancing the role of the World Heritage Convention in the IUCN WCPA Marine Global Plan of Action for MPAs in our Oceans and Seas*. Switzerland: IUCN.
[331] Ibid.
[332] Freestone, Laffoley, Douvere, Badman, above n 297, 15.
[333] UNESCO. Intergovernmental Committee for the protection of the World Cultural and Natural Heritage. Operational Guidelines for the Implementation of the World Heritage Convention. 2012.
[334] Freestone, Laffoley, Douvere, Badman, above n 297, 48.

sites with OUV are protected and that they cover all major marine regions and ecosystems.[335] There are, however, a number of lacunae in the framework advanced by the Convention as it applies to the marine environment. Thus, for example, an independent audit recommendation from the *Evaluation of the Global Strategy*[336] *and the PACT initiative*[337] concluded that "there are zones, such as the High Seas (part of the Arctic) and the Antarctic, to which the World Heritage Convention does not apply, zones that escape the sovereignty of States Parties."[338]

In light of this finding, the UNESCO External Auditor recommended that the World Heritage Committee should "reflect on appropriate means to preserve sites that correspond to conditions of OUV which are not dependent upon the sovereignty of States Parties."[339] To address this recommendation, UNESCO launched the report titled *World Heritage in the High Seas: An Idea Whose Time Has Come*, where the CRD has been identified as an example of OUV in ABNJ.[340] Four additional proposed ABNJ illustrations reflect the unique variety of ecosystem types, natural marine phenomena and biodiversity that exist in the High Seas and would merit World Heritage recognition.[341]

All the coastal States concerned with the CRD, namely Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala and Mexico, are parties to the 1972 Convention. Within this region, four marine sites have been designated within national jurisdiction.[342]

A brief analysis of the CRD illustration explores the potential justification of the application of World Heritage criteria and its inclusion on the list of protected marine sites. Crucially, the CRD meets three main criterion for inclusion, namely: a) Criterion VIII – Major States in Earth's History and Geological processes; b) Criterion IX –

[335] WHC-11/35.COM/INF.9A. Paris, 27 May 2011, 24.
[336] Ibid.
[337] See note 335.
[338] Freestone, Laffoley, Douvere, Badman, above n 297, 19.
[339] See note 335, 24.
[340] Freestone, Laffoley, Douvere, Badman, above n 297, 34.
[341] Ibid. 24.
[342] Namely: Archipiélago de Revillagigedo (Mexico), Islands and Protected Areas of the Gulf of California (Mexico), Whale Sanctuary of El Vizcaino (Mexico) and Área de Conservación Guanacaste (Costa Rica). UNESCO World Heritage Marine Programme (2017) *World Heritage Sites*. Available at: http://whc.unesco.org/en/marine-programme/

Significant Ecological and Biological processes in the evolution of ecosystems, communities of plants and animals; and c) Criterion X Significant biological diversity and threatened.[343]

In addition, the report gives three options by which Parties to the Convention could consider implementing changes to allow the inscription and protection of marine sites in ABNJ on the UNESCO World Heritage List.[344] The three proposed modalities are: 1) Bold interpretation of the Convention, either through incremental change or a formal policy change; 2) Amendment outside the terms of the 1972 Agreement akin to the 1994 Part XI Implementing Agreement to the United Nations Convention on the Law of the Sea (UNCLOS); and 3) An optional protocol to the 1972 Convention, developed through an international negotiation among States Parties, binding only those States that choose to ratify any resulting protocol. [345]

Finally, the report explores elements on management and protection of OUV in the High Seas. As will be explored in chapter 8 in greater detail, the existing management measures in ABNJ are largely sectorial and diffuse in material and geographical scope.[346] In spite of this, State Parties could agree among themselves on a regime for the protection of designated sites in ABNJ; or to further enhance collaboration with existing international sectorial organisations with relevant competences.[347]

3.8 APPRAISAL OF THE MULTILATERAL ENVIRONMENTAL FRAMEWORK

In assessing the multilateral framework, it is pertinent to recall that UNCLOS was negotiated at a time when there was not a full scientific understanding of status and functioning of biodiversity in the marine environment. In particular, there was an absence of definitive knowledge of the deep-sea ecosystems. At a supranational level, although UNCLOS and its related agreements continue to provide the overarching framework for the protection and preservation of the marine environment, many other multilateral instruments are relevant to the protection of ecosystems and biodiversity

[343] Freestone, Laffoley, Douvere, Badman, above n 297, 46.
[344] Ibid. 11.
[345] Ibid.
[346] D. Freestone (2016) 'Governance of areas beyond national jurisdiction: an unfinished agenda?' in The UN Convention on the Law of the Sea: A Living Treaty? *British Institute of International and Comparative Law*, 231-266.
[347] Freestone, Laffoley, Douvere, Badman, above n 297, 53.

both within and beyond national jurisdiction. Despite the complex regulatory architecture, the loss of biodiversity continues and the zonal approach under UNCLOS fails to address the transboundary nature of marine ecosystems.

There are some notable weaknesses in the regulatory architecture from legal and governance perspectives. First, few if any of the measures were negotiated to address the specific risks faced by deep sea biodiversity today. Paradoxically, the principal legal instrument for the protection of biodiversity, CBD, explicitly excludes its direct application to the protection of biodiversity in ABNJ. There is no international body with an express mandate to protect deep sea biodiversity. As a result, it is easy to conclude that the regulatory framework and institutional architecture for the protection and use of biodiversity in ABNJ remains highly prescriptive, diffuse and requires further reform and enhancement. Secondly, the limited competence of multilateral and regional bodies, which remained focused on sector activities such as fishing and shipping activities, makes them unsuitable to tackle crosscutting governance and management issues, or to effectively address the cumulative effects of the various anthropogenic impacts on the marine environment, or indeed to respond to new scientific knowledge about the status of the marine environment and the resources that it supports. This is further aggravated by the fact that there are few Treaty mechanisms to ensure great collaboration and coordination between the various bodies with regulatory governance mandates such as the IMO, the ISA and the regional seas bodies. Thirdly, the latter shortcoming is compounded by the phenomenon of implementation drift in relation to current legal instruments. Notably, El Salvador is not party to UNCLOS, only two States are party to the CMS (Costa Rica and Honduras).[348] Likewise, as seen above, the scheme of conservation and management provided by the CMS requires the concerted action and cooperation of all States in which such species spend any part of their life cycle. In this context, there is no regional seas programme applicable to the Eastern Pacific Ocean to facilitate regional cooperation and coordination of conservation and sustainable use of biodiversity both within and beyond national jurisdiction. Fourthly, apart from the 1995 Fish Stocks Agreement, there are inherent weaknesses in the current multilateral measures in so far as not all of the instruments codify new normative approaches to environmental management to ensure the conservation and sustainable use of biodiversity such as the ecosystem

[348] Warner, above n 132, 758-764.

approach and the precautionary principle, or indeed the application of spatial management tools or environmental impact assessment.[349] Fifthly, there are no universal schemes for enforcement and compliance in relation to environmental protection that go beyond the limitations of flag State jurisdiction as it applies to ABNJ in the context of discrete sectors such as shipping, vessel source pollution, fishing and seabed mining. Finally, the political landscape has changed and there is a pressing need to keep in mind the strong nexus between marine biodiversity and the broader sustainable development objective as set out in Sustainable Development Goal 14, which directly builds upon the Aichi Biodiversity Targets.

All of the aforementioned failures and shortcomings explain why there is a UN process underway to protect biodiversity and sustainably biodiversity in ABNJ. They also explain why there is a pressing need for the establishment of a comprehensive and robust regional governance framework and that is specific to the CRD, along the lines advanced in chapter 9 of this study.

3.9 CONCLUSIONS

Although the law of the sea regime applicable to the conservation and sustainable use of marine resources in ABNJ has evolved considerably, it is still insufficient to adequately protect the particular characteristics of deep sea ecosystems beyond the jurisdiction of States. Relevant shortcomings were identified in the present chapter, making evident the need for further enhancement of the global environmental legal framework, and the key role of complementary regional frameworks to materialize the enforcement of international obligations on marine conservation. As seen, significant conservation tools are contained in a variety of multilateral instruments reviewed in this chapter. Nevertheless, efficient coordination among the bodies established through these Conventions is far from accomplished, even though their ultimate goal ought to be the conservation of biodiversity. Clearly, existing tools and regulatory provisions could be further enhanced in the Central American region through the development of substantive provisions in the CRD Agreement, and as will be seen in chapter 9. It is

[349] On principles, see discussion *infra*. Also, *inter alia*: D. Freestone (2008) 'Principles applicable to modern Oceans Governance,' *International Journal of Coastal and Marine Law*, Vol. 23(3), 385–391, and R. Long, 'Principles and normative trends in European Union ocean governance' in C. Schofield, S. Lee, M. Kwon (eds.), *The Limits Of Maritime Jurisdiction* (Boston/Leiden: Brill/Nijhoff Publishers, 2014), 629-726.

important to keep in mind that the CRD has been gradually gaining international recognition in multilateral forums as a distinctive oceanographic feature in need of further protection. In this regard, the further development of the law of the sea is contingent upon regional cooperation and through agreement in coordinated responses, in line with the hypothesis advanced in chapter 1. As will be seen next, the sector-specific instruments and institutions analyzed in chapter 4, as well as the regional bodies discussed in chapter 5, clearly need a treaty-based regional cooperation framework underpinned by the rule of law to address the growing threats to the unique biodiversity of the CRD in ABNJ.

CHAPTER 4. SECTOR SPECIFIC INSTRUMENTS AND GOVERNANCE ARRANGEMENTS: JURIDICAL GAPS, CHALLENGES AND SCOPE OF APPLICATION IN THE CRD

4.1 INTRODUCTION

As seen in chapter 3, UNCLOS provides the overarching legal framework for protecting the marine environment in areas beyond national jurisdiction (ABNJ, hereafter), which is supplemented by other international instruments that have developed rules applicable to activities that take place in the CRD, in particular regarding the powers and jurisdictions of flag States over vessels flying their flags when operating in ABNJ.[1] With a view to testing the hypothesis advanced in chapter 1, that regional discrete arrangements are a necessary corollary of multilateral and sector specific instruments in the conservation and sustainable use of biodiversity of the CRD, the chapter reviews the regulatory regimes applicable to four activities that take place or have the potential to take place in the Dome, namely: fisheries, navigation, seabed mining and the conduct of marine scientific research including the transfer of marine technology. Accordingly, in relation to each of these activities, the following chapter will examine some of the principal Conventions and area-based management tools developed and implemented under the auspices of the United Nations, the Food and Agriculture Organisation (FAO), the International Maritime Organisation (IMO), and the International Seabed Authority (ISA). The chapter is divided up into four sections for this purpose. In doing this, each of the constituent elements places specific attention on instruments that are relevant to the protection of fragile and unique marine ecosystems and species associated with the CRD. Moreover, in undertaking this analysis, the chapter strives to address three specific research questions: first, the efficacy of existing instruments and governance arrangements in protecting marine biodiversity; second, the shortcomings in the implementation and compliance with existing legal obligations; third, the scope for further reform of the multilateral framework with a view to improving the conservation and sustainable use of biodiversity in ABNJ. As such, the chapter is mainly concerned with identifying lacunae in the legal obligations and

[1] Y. Tanaka, *The International Law of the Sea,* 2 ed., (Cambridge: Cambridge University Press, 2015), 149.

multilateral governance arrangements under sector specific instruments that apply, or have the potential to apply, to activities undertaken in the CRD, thus providing a further analytical plinth for the synthesis undertaken in chapter 9.

4.2 FISHERIES AND BIODIVERSITY

One of the most pressing sector specific challenges in ABNJ is the conservation of fisheries and the restriction of adverse impacts of fishing activity on biodiversity.[2] As is well known, fisheries are regulated at international, regional and national levels and all States have collective responsibility regarding their management and sustainable exploitation in ABNJ. Five instruments are reviewed below, namely: United Nations Agreement for the implementation of the provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks; the FAO Agreement on Port State measures to prevent, deter and eliminate illegal, unreported and unregulated fishing; the FAO Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas, the FAO International guidelines for the management of deep-sea fisheries in the high seas, and the FAO Code of Conduct for responsible fisheries, as well as a number of United Nations General Assembly (UNGA, hereafter) resolutions on the conservation of deep-sea fish stocks.[3] Again, it should be noted that the discussion here is focused on the legal aspects of fisheries management measures in the context of the broader goal of protecting marine biodiversity. Indeed, fish are a core component of biodiversity but many fisheries continue to be regulated following a species-specific approach without due regard to broader ecological or sustainability considerations despite the fact that the International Court of Justice highlighted as far back as 1974 the need for "conservation for the benefit of all in the management of the living resources of the high seas."[4] As seen in chapter 2, the continued depletion of the living resources

[2] See T. R. Parsons (1991) 'Impact of fish harvesting on ocean ecology,' *Marine Pollution Bulletin*, Vol. 22, 217. Also see: G. W. Boehlert (1996) 'Biodiversity and the sustainability of marine fisheries;' *Oceanography*, Vol. 9, 28.
[3] For example UNGA Resolutions 59/25 (2004), 61/105 (2006), 64/72 (2009) and 66/68 (2011) address the reduction of overfishing and call for the prevention of significant adverse impacts on vulnerable marine ecosystems and ensure sustainability of deep-sea fish stocks.
[4] See: *Fisheries Jurisdiction Case (United Kingdom v. Iceland), Judgment, I.C.J. Reports 1974*, 31 para. 72. Also see Tanaka, above n 1, 250-251.

associated with the CRD and fisheries in particular is a matter of serious and pressing concern.

4.2.1 Conundrum of straddling and highly migratory fish stocks: The 1995 Fish Stocks Agreement

Although UNCLOS refers to the straddling and highly migratory stocks, there was no comprehensive agreement on how best to regulate these fish stocks during the course of the Third United Nations Conference on the Law of the Sea (UNCLOS III).[5] As is well known, the resulting treaty, UNCLOS, provides only a few broad principles for the management of the straddling and highly migratory fish stocks, as well as high seas fish stocks.[6] As indicated previously in chapter 3, the freedom of fishing is one of the cardinal freedoms of the high seas,[7] but whilst all States have the right to engage in fishing on the high seas, this activity must be undertaken subject to the relevant provisions contained in UNCLOS.[8]

In this regard, UNCLOS is complemented by the United Nations Agreement for the implementation of the provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks (Fish Stocks Agreement or UNFSA, hereafter)[9] that aims to ensure the long-term conservation and sustainable use of straddling and highly migratory fish stocks.[10] Crucially, it also contains key provisions aimed at avoiding and mitigating the adverse impacts of fishing on the marine

[5] D. Rothwell, T. Stephens, *The International Law of the Sea*, 2 ed., (Oxford and Portland Oregon: Hart Publishing, 2016), 19.
[6] UNCLOS. Articles 63, 64, Part VII.
[7] Ibid. Article 67.
[8] Rothwell, Stephens, above n 5, 159.
[9] United Nations Convention on the Law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks. 2167 UNTS 88. Entered into force on 11 December 2001. For commentary, see, *inter alia*: P. G. Davies, C. Redgewell (1996) 'The international legal regulation of straddling fish stocks,' *British Yearbook of International Law*, Vol. 6, 199, 265; Y. Takei, *Filling regulatory gaps in high seas fisheries* (The Netherlands: Brill Leiden, 2013), 88; E. Franck (2000) '*Pacta Tertiis* and the Agreement for the implementation of the straddling and highly migratory fish stocks provisions of the United Nations Convention on the Law of the Sea,' *Tulane Journal of International and Comparative Law*, Vol. 8, 49.
[10] UNFSA. Article 2.

environment, the preservation of biodiversity, as well as measures that seek to ensure the maintenance of the integrity of marine ecosystems.[11]

The 1995 UNFSA has a broad geographical scope, and it is applicable in areas under and beyond national jurisdiction, including the CRD.[12] As emphasized by Rothwell and Stephens, this Agreement is based upon fundamental principles contained in Part 2,[13] which require all States to adopt measures to ensure the long-term sustainability and optimum utilization of fish stocks.[14] To accomplish this goal, States should take measures according to the best scientific evidence;[15] the application of the precautionary[16] and ecosystem approach;[17] the minimization of pollution and by-catch;[18] the protection of marine biodiversity;[19] the elimination of overfishing and over-capacity;[20] the collection and sharing of fisheries data;[21] and the implementation and enforcement of conservation measures by effective monitoring, control and enforcement.[22]

Most notably, the Agreement codifies the precautionary approach and provides a framework for its application and operationalization.[23] In addition, coastal States and flag States have several duties and responsibilities,[24] and are required to fully cooperate with measures to guarantee long-term sustainability of fish stocks.[25] Thus, for example, States whose nationals fish in the high seas must establish cooperation mechanisms furthering conservation.[26] In addition, given that EEZ boundaries are politically, rather than ecologically determined, they must also ensure the integrity of ecosystems that sustains migratory species through the adoption of measures that are compatible for

[11] Ibid. Recital 7.
[12] Ibid. Article 3.
[13] Rothwell, Stephens, above n 5, 316.
[14] UNFSA, Article 5(a).
[15] Ibid. Article 5(b).
[16] Ibid. Article 5(c).
[17] Ibid. Article 5(d), (e).
[18] Ibid. Article 5(f).
[19] Ibid. Article 5(g).
[20] Ibid. Article 5(h).
[21] Ibid. Article 5(j).
[22] Ibid. Article 5(l).
[23] Ibid. Article 6.
[24] Ibid. Article 18, 19.
[25] Ibid. Article 20.
[26] Rothwell, Stephens, above n 5, 303.

adjacent high seas and for areas under national jurisdiction.[27] We will return to many of these principles in chapter 9 and the issue of adjacency more specifically.

From the perspective of conservation and sustainable use of biodiversity it is notable that the UNFSA also provides that fisheries management measures do not result in "harmful impact on the living marine resources as a whole."[28] Furthermore, the International Tribunal on the Law of the Sea has indicated that the ultimate goal of sustainable management of fisheries "is to conserve and develop them as a viable and sustainable resources, and that therefore sustainable management meant conservation and development as referred to in Article 63(1) of UNCLOS."[29]

Nevertheless, the Fish Stocks Agreement lacks a central institutional or coordination mechanism. As pointed out by Duncan Currie in a personal communication with the author, the four-year review was the only feature established in the Agreement.[30] Furthermore, "the Parties have extended the review mechanism by adopting the practice of adjourning, rather than closing, the Review Conference[31] and convening it in 2010 and again in May 2016."[32] In this regard, the new BBNJ Agreement, which will be further analysed in chapter 8, could establish a decision-making body that may provide a complementary mechanism, which could assist UNFSA Parties and RFMOs by enhancing coordination. This issue is again elaborated upon in chapter 9 in the context of a new regional treaty for the CRD.

Important to note is that the UNFSA places considerable emphasis on flag State jurisdiction and this is clearly one of its key weaknesses from the perspective of this thesis.[33] In this regard, one key feature of flag State jurisdiction is that the regulation of biodiversity in the high seas can only proceed on the basis of cooperation between States through the good offices of regional fisheries management organisations

[27] UNFSA. Article7(1)(b).
[28] Ibid. Article 7(2)(f).
[29] *Definition of the minimum access conditions and exploitation of fisheries resources within the maritime zones under the jurisdiction of Sub-Regional Fisheries Commission (SRFC) Member States,* ITLOS Case No. 21 (Advisory Opinion) 2015, para. 191.
[30] Rodriguez, M. (2017) Email to Duncan Currie, 12 July.
[31] Review Conference on the Agreement for the Implementation of the provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks. Report of the Review Conference, 136, U.N. Doc. A/CONF.210/2006/15, July 3 2006.
[32] Ibid.
[33] UNFSA. Recital 4, articles 18-22.

(RFMOs). Also important to take into consideration is the fact that if a fisheries management arrangement is generally settled by a group of States, it must undertake specific requirements[34] and shall carry out diverse functions.[35] In this context, non-participant States are not discharged from the obligation to cooperate in the conservation and management of such fish stocks.[36]

However, some arguments on the performance of RFMOs must be addressed and highlighted here given their importance for the conservation and sustainable use of biodiversity in the CRD. In the high seas, as noted in the scientific literature, "scombrids (i.e. tunas and mackerel), fast, open-ocean predators, are among the most economically and socially important marine species, but their populations have been declining."[37] Moreover, tuna RFMOs have fallen short of their conservation and fishery management mandates, and even though they have made varying degrees of progress on performance reviews,[38] for example in recovering stocks, a number of managed stocks remain overfished or are experiencing overfishing.[39] In addition, other elements hinder the efficient implementation of RFMO mandates, such as the lack of scientific capacity, the lack of transparency and efficiency in decision-making, the lack of political will, the need for better data reporting and collection, among others.[40]

Moreover, the majority of tuna RFMOs use primarily single-species management approaches, focusing on maintaining and recovering stocks of tuna and tuna-like species, as opposed to a comprehensive ecosystem-based management approach and the associated maintenance of biodiversity, trophic level functions and diversity. This restricted scope does not take into account other relevant marine species in the high seas,[41] thus there is a gap in the integral conservation of biodiversity in ABNJ. In this

[34] Ibid. Article 9.
[35] Ibid. Article 10.
[36] Ibid. Article 17, 33.
[37] A. Rodgers, L. Woodall, C. Stewart (2017) *Function of the high seas and anthropogenic impacts***:** *Science update 2012 – 2017*. Oxford: Oxford University, 15. Also see: M. Juan Jorda, I. Mosqueira, J. Freire, N. Dulvy (2013) 'The conservation and management of tunas and their relatives: Setting life history research priorities,' *Plos One*. Vol. 8.
[38] "The performance review process for these RFMOs is a process recommended in 2006 during the resumed Review Conference on the U.N. Fish Stocks Agreement, which provides an objective means of evaluating their performance and identifying areas needing improvement." High Seas Alliance. Sectoral challenges in ABNJ. Internal working document. 2016.
[39] FAO. 2016. *The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all.* Rome, 38.
[40] High Seas Alliance, above n 38, 1.
[41] Ibid.

regard, the idea of closing the high seas to fisheries arises within international discussions from time to time, as studies "modelling high seas total closure to determine the impact on highly migratory, high-value fish have revealed that total closure increased the catch for all fisheries in EEZs, but not for all countries, due to where fleets currently fish most of the time."[42] Again, this is an inherent weakness in the management model advanced by the UNFSA.

Another challenge within the implementation of RFMO mandates is that "meaningful management actions can be delayed for years by Contracting Parties' failure to reach a consensus on the interpretation of regional bodies' management mandates."[43] In this regard, a new BBNJ Agreement could strengthen and complement the management aims of the tuna RFMOs. For example, complimentary procedures such as the creation of high seas MPAs provide an option to enhance management of highly migratory species and ensure biodiversity is not threatened by fishing activities.[44] Also, the consolidation of strong cooperation and collaborative mechanisms may enhance the effectiveness of measures on conservation and sustainable use of marine biodiversity in ABNJ by RFMOs, and even move forward towards achieving SDG 14.[45]

The RFMO that regulates high seas fisheries in the CRD is the Inter-American Tropical Tuna Commission (IATTC),[46] which will be further analysed in chapter 5 of this thesis. This RFMO was created before the UN Fish Stocks Agreement was adopted, but follows its legal framework and generally comprehends key provisions set out therein.

From a capacity building perspective with respect to developing States, the UNFSA calls for cooperation [47] to ensure assistance between States and international organisations including cooperation with financial assistance, development of human

[42] Rodgers, Woodall, Stewart, above n 37, 16. See also: C. White, C. Costello (2014) 'Close the high seas to fishing?,' *PLoS Biology*, Vol. 12.
[43] Ibid. 2.
[44] Ibid.
[45] SDG Goal 14: "To conserve and sustainably use the oceans, seas and marine resources for sustainable development." UNGA Resolution A/RES/70/1, 21 October 2015, 14.
[46] 1949 Convention for the establishment of the Inter-American Tropical Tuna Commission (IATTC). 80 UNTS 3. Entered into force on 3rd March 1950. Subsequently, the Antigua Convention was negotiated to strengthen and replace the 1949 Convention establishing the IATTC, and entered into force on 27 August 2010.
[47] UNFSA. Article 25, 26.

resources, and the transfer of technology, among other matters.[48] Likewise, cooperation in enforcement of conservation measures[49] is a key element in the UNFSA, and provisions in this regard include the establishment of procedures for boarding and inspection[50] by coastal, port[51] and flag States.[52]

Finally, it ought to be noted that this Agreement is supplemented by two Annexes. The first one specifies the standard requirements for the collection and sharing of fishery data,[53] as well as vessel data provisions[54] and reporting information for flag States.[55] Crucially, from a biodiversity perspective, Annex 2 establishes seven guidelines for the application of precautionary reference points in conservation and management of straddling and highly migratory fish stocks.[56] In specific cases where information is not available, provisional reference points may be established by analogy to similar and better-known stocks.[57] Clearly, any CRD related initiative to improve the conservation and protection of biodiversity could apply such tools within a putative governance scheme to improve fisheries management in ABNJ. The later issue is further explored in chapter 9. Furthermore, as noted by both Freestone and Barnes, the detailed iteration of the precautionary approach in the 1995 Agreement is of paramount importance for the protection of biodiversity at both global and regional levels.[58] More specifically, as noted by Barnes, the importance of the precautionary approach should not be underestimated as it establishes "a more proactive approach to decision-making, which includes the setting of reference points for sustainable fisheries that when reached should trigger ameliorative action."[59] The prompting of such a response is of course clearly relevant in cases of scientific uncertainty regarding the status of fish stocks in the

[48] Ibid. Part VII.
[49] Ibid. Article 20, 21.
[50] Ibid. Article 22.
[51] Ibid. Article 23.
[52] Ibid. Article 18 (i), 19 (b), 21 (2), (8), 22.
[53] Ibid. Annex I, article 3.
[54] Ibid. Annex I, article 4.
[55] Ibid. Annex I, article 5.
[56] Ibid. Annex II.
[57] Ibid. Annex II (6).
[58] D. Freestone (1999) 'Implementing precaution cautiously: The precautionary approach in the straddling and highly migratory fish stocks Agreement,' in E. Hey (ed.), *Developments in International Fisheries Law* (The Netherlands: Brill-Nijhoff, 1999), 286.
[59] R. Barnes, 'Fisheries and marine biodiversity' in M. Fitzmaurice, D. Ong, P. Merkouris, *Research Handbook on International Environmental Law* (United Kingdom: Edward Elgar Publishing, 2010), 551. Also see: FAO (1996), *Precautionary approach to capture fisheries and species introductions*. FAO Technical Guidelines for Responsible Fisheries No. 2. FAO: Rome.

CRD,[60] as well the health of the associated biodiversity. We will return to this point in chapter 9.

Significantly, in Central America, the UNFSA has only been ratified by Costa Rica.[61] This represents a major weakness in the regional approach to the management of migratory and straddling fish stocks, which must be resolved if an appropriate and effective fisheries conservation regime is to be established for the CRD at a multilateral or regional level with a view to ensuring amongst other matters the conservation and sustainable use of biodiversity. On the other hand, there is a degree of progress at a regional level in so far as Mexico and the five Central American countries have all established specialized institutions to manage fisheries at a national level including the supervision of the activities of their vessels operating in ABNJ.[62] However, as seen in chapter 2, there is an absence of precise data or complete records on the quantity of vessels regularly fishing in the Dome's waters, and for this reason; pressure posed by fishing activities of high seas stocks remains a pressing problem in the CRD.[63] Furthermore, the IATTC has only a limited mandate[64] to regulate the impact of fishing on biodiversity as will be seen further on below, as the principal focus of the IATTC Antigua Convention is on the conservation and the optimum utilization of tuna and tuna-like species and not on the conservation and sustainable use of biodiversity *per se*.[65]

4.2.2 The scourge of IUU fishing and the FAO Port State Measures

The overall objective of FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA, hereafter)[66] is, as its name indicates, to prevent, deter and eliminate IUU fishing through the

[60] Inter-American Tropical Tuna Commission (2016) *Tunas, billfishes and other pelagic species in the Eastern Pacific Ocean*. Fishery Status Report No. 12, 142.
[61] Date of ratification: 18 June 2000.
[62] These include, *inter alia*: the Nicaraguan Institute of Fisheries and Aquaculture; the Costa Rican Institute of Fisheries and Aquaculture; the Unit of fisheries management and aquaculture of Guatemala; the Centre for Development of Fisheries and Aquaculture of El Salvador; and the Directorate General of Fisheries and Aquaculture of Honduras.
[63] P. Cubero Pardo, D. A. Martínez Cascante (2013) *Análisis de la pesquería de atún en la zona económica exclusiva del Pacífico de Costa Rica*. Costa Rica: FECOP.
[64] Antigua Convention. Article 2.
[65] Ibid.
[66] FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing. Entered into force on 5 June 2016.

implementation of effective port State measures, as well as to ensure the long-term conservation and sustainable use of living marine resources.[67] This is an important consideration in the management of fisheries at both global and regional levels in so far as IUU fishing has a major bearing on the health of marine ecosystems and the biodiversity that it supports.[68] Indeed, there is a considerable body of evidence from the FAO which demonstrates that unsustainable fishing practices and IUU fishing in particular are the primary threats to biodiversity at global and regional levels.[69] This is also supported by the findings of the FAO in their Report, *State of World Fisheries and Aquaculture 2016*,[70] as well as in the joint FAO/ World Bank Report, the *Sunken Billions*.[71]

The PSMA material scope applies to fishing activities conducted in marine areas that are illegal, unreported or unregulated, and to fishing-related activities in support of such fishing.[72] Furthermore, the Agreement's personal scope encompasses port States and also vessels not entitled to fly its flag that are seeking entry to its ports or are in one of its ports.[73] Two exceptions were incorporated in this instrument, consequently, the Agreement's provisions are not applicable to vessels of a neighbouring State that are engaged in artisanal fishing for subsistence,[74] and container vessels that are not carrying fish or, if carrying fish, only fish that have been previously landed.[75] Finally, the geographical scope of the Agreement is global, being applicable to all ports.[76]

Parties have specific measures concerning the enforcement powers of Port States[77] as well as Flag States.[78] In a similar approach to other multilateral treaties, cooperation

[67] PSMA. Article 2.
[68] See: R. Arnason, K. Kelleher, R. Willmann (2009) *The sunken billions, the economic justification for fisheries reform*. Washington DC: The World Bank, 1. Most recently, an updated version of this Report has been published in 2017. M. Kobayashi, et. al., (2016) *The sunken billions revisited. Progress and challenges in global marine fisheries*. Washington DC: The World Bank.
[69] FAO (2009) *Report of the FAO/UNEP expert meeting on impacts of destructive fishing practices, unsustainable fishing, and illegal, unreported and unregulated (IUU) fishing on marine biodiversity and habitats*. Rome: FAO, 12.
[70] FAO, above n 39.
[71] See Arnason, Kelleher, Willmann, above n 68.
[72] PSMA. Article 3 (3).
[73] Ibid. Article 3 (1).
[74] Ibid. Article 3 (1.a).
[75] Ibid. Article 3 (1.b).
[76] Ibid. Article 3 (5).
[77] Ibid. Article 3, 5.
[78] Ibid. Article 20.

and exchange of information[79] are regulated comprehensively under this Agreement. Furthermore, cooperation of flag States with port States is crucial, given that flag States have the responsibility under international law for controlling the fishing activities of a vessel, no matter where the vessel operates.[80] Specifically relevant to the CRD initiative, this Agreement places considerable emphasis on the importance for Parties to cooperate at the regional and global levels in the effective implementation of measures to prevent IUU fishing.[81]

The PSMA is exceedingly technical and sets out key requirements and processes regarding the entry, use and denial[82] of ports.[83] In this regard, port States must request specific information from a fishing vessel before granting entry to port, such as its flag State, certificate of registry, and RFMO identification, among others.[84] There are specific guidelines on inspections and follow-up actions,[85] particularly if it is established that a vessel is engaged in IUU fishing or prohibited fishing. For instance, if it is found that a vessel has engaged in IUU fishing in ABNJ, the port State should immediately report the matter to the flag State of the vessel and, where appropriate, the relevant coastal States and regional fisheries management organisation.[86] Exchange of information, including sightings information or derived from landings or trade data[87] is crucial to accomplish this enforcement objective.

There is no specific emphasis on the conservation and sustainable use of biodiversity in ABNJ or elsewhere in the FAO International Plan of Action to Deter, Prevent and Eliminate IUU Fishing, however this instrument is intended to further develop some of the provisions of the PSMA. Nonetheless, the Plan of Action provides that vessels should not fish on the high seas except pursuant to express authorisation by the flag State, and a flag State should not grant such authorisation to a vessel unless it can

[79] Ibid. Article 6.
[80] UNCLOS. Article 94.
[81] PSMA. Article 6.
[82] Ibid. Article 9.
[83] Ibid. Part 2, 3.
[84] Detailed in Annex A of the PSMA.
[85] PSMA. Part 4.
[86] FAO (2001) *International Plan of Action to Deter, Prevent and Eliminate Illegal, Unreported and Unregulated Fishing. (IPOA IUU)*. Rome: FAO, 16.
[87] Ibid. 20.

ensure that the vessel will not undermine fishery conservation and management measures that apply in the high seas area in which the vessel will operate.[88]

Again, there are major weaknesses in the regional approach in so far as in the Central American region only Costa Rica[89] and Panama[90] have ratified the Port State Measures Agreement. That said, Guatemala[91] and El Salvador[92] have adopted several measures related to the control of ports and landing of fish products. On the other hand, at the time of writing, Honduras and Nicaragua had not updated the FAO database on national measures to implement this important Agreement, which is absolutely crucial to the protection and preservation of biodiversity from the effects of IUU fishing.

4.2.3 Enhancing enforcement: The FAO Compliance Agreement

The FAO Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas (the Compliance Agreement)[93] was developed in parallel with the UNFSA, and one of its goals is to address the reflagging of fishing vessels under flags of convenience.[94] At the time of writing, 40 States had ratified the Compliance Agreement, with several major high seas fishing States that are active in the ABNJ part of the CRD remaining outside its purview, including Taiwan and China.[95]

The personal scope of the Agreement covers all fishing vessels that are used or intended for fishing on the high seas.[96] Notably, the FAO Compliance Agreement material scope encompasses all high seas fishing, while the UNFSA addresses only straddling and highly migratory fish stocks. In addition, the international conservation of the living

[88] Ibid. 11.
[89] Costa Rica ratified the PSMA on the 4 December 2015.
[90] Panama ratified the PSMA on the 21 November 2016.
[91] FAO (2017) 'Database on Port State measures: Guatemala.' Available at: http://www.fao.org/fi/website/FISearchAction.do
[92] FAO (2017). 'Database on Port State measures: El Salvador.' Available at: http://www.fao.org/fi/website/FISearchAction.do
[93] FAO Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas. 2221 UNTS 91. Entered into force 24 April 2003.
[94] FAO Compliance Agreement. Recitals 4, 9.
[95] FAO (2017) 'Parties to the Compliance Agreement.' Available at: http://www.fao.org/fileadmin/user_upload/legal/docs/012s-e.pdf
[96] FAO Compliance Agreement. Article 2 (1). Exceptions on specific vessels are included in this article.

resources of the high seas is addressed in multiple provisions of the Compliance Agreement.[97] Within the Agreement's framework, flag States have duties and responsibilities;[98] like for example; the suspension or withdrawal of a fishing authorisation to vessels that have contravened management measures,[99] or denial of authorisation to fly its flag if a fishing vessel has previously undermined the effectiveness of international conservation and management measures.[100] Parties to the Agreement should also ensure that all fishing vessels flying its flag are entered in the record of fishing vessels,[101] and must provide information on its operations, including areas of fishing operations, catches and landings.[102]

As seen in previous international instruments addressed in this section, cooperation and exchange of information[103] are significant tools and are also included in this Agreement. Specifically, it calls for Parties to enter into cooperative arrangements of mutual assistance on a global, regional, sub-regional or bilateral basis,[104] and to cooperate with developing countries.[105] In the instance of the CRD, these forms of cooperative arrangements within the IATTC could enhance the achievement of compliance goals in regards to high seas fishing activities and the conservation of these fish stocks, as well as the protection of biodiversity. Again, this issue is addressed in chapter 5 of this study.

Finally, and in relation to the geographical range of the CRD, only Mexico[106] is a Party to this instrument, and none of the Central American countries have ratified the Agreement, an element which represents a fundamental weakness in the regional approach to the management and control of high seas fisheries as well as the protection of marine ecosystems within the parameters established by the FAO Compliance Agreement.

[97] Ibid. Recitals 2, 4, 6, 7, 9, and Articles 1(b), 3(1.a), 3(1.b), 3(5.a), 5, 6(8.a), 8.
[98] Ibid. Article 3.
[99] Ibid. Article 3(8).
[100] Ibid. Article 3(5.a).
[101] Ibid. Article 4, 6.
[102] Ibid. Article 3.
[103] Ibid. Article 5, 6.
[104] Ibid. Article 7.
[105] Ibid.
[106] Mexico ratified the Compliance Agreement on 11 March 1999.

4.2.4 Soft law: International Guidelines for the management of deepsea fisheries in the high seas

Deep-sea ecosystems support vulnerable species which have unique features, such as: low productivity rates, they mature at a relatively old age, are long-lived, slow growing, low natural mortality, have intermittent recruitment and may not spawn every year.[107] Moreover, as noted in the scientific literature "deep-sea fish have some of the least-resilient populations with lowest productivity and it is unlikely that some can be fished sustainably."[108] Some examples of these vulnerable species and their associated biodiversity are cold-water corals and hydroids, sponge-dominated communities and vent communities comprised of unique invertebrate and microbial species.[109]

In addressing the challenging aspects of such fragile species, the FAO adopted the International Guidelines for the management of deep sea fisheries in the high seas (FAO DSF Guidelines, hereafter). According to these Guidelines, deep sea ecosystems would be considered vulnerable[110] when they present the following characteristics: uniqueness or rarity,[111] functionally significant,[112] fragility,[113] life-history traits of component species that make recovery difficult,[114] and structurally complex.[115]

It is important to highlight that the vulnerable marine ecosystem (VME, hereafter) concept emerged from discussions at the United Nations General Assembly (UNGA, hereafter) and gained momentum after UNGA Resolution 61/105.[116] Furthermore, these voluntary guidelines are a reference instrument that informs States and RFMOs in the formulation of further regulations on the prevention of significant adverse impacts on VMEs. For example, once a VME has been identified, specific management measures

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[107] FAO (2009) *International Guidelines for the Management of Deep-sea Fisheries in the High Seas*. Rome: FAO. Annex.
[108] Rodgers, Woodall, Stewart, above n 37.
[109] FAO DSF Guidelines. Annex.
[110] Ibid. 27.
[111] Ibid. Unique or endemic species, communities or habitats, whose loss could not be compensated for by similar areas or ecosystems.
[112] Ibid. Contain areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages, or of rare, threatened or endangered marine species.
[113] Ibid. Ecosystem that is highly susceptible to degradation by anthropogenic activities.
[114] Ibid. Ecosystems characterized by slow growth rates; late age of maturity; low or unpredictable recruitment; or long-lived.
[115] Ibid. Ecological processes are usually highly dependent on these structured systems.
[116] UNGA Resolution 61/106, 8 December 2006.

must be taken to ensure that the ecosystem integrity is not compromised.[117] Furthermore, precautionary conservation and management measures are essential features that should mitigate the effects of high seas fisheries on the environmental status of VMEs.[118] This includes temporal and spatial restrictions or closures of areas to deep seas fisheries where VMEs are known or likely to occur,[119] changes in gear design or deployment or operational measures,[120] monitoring of all fishing efforts, capture of species and interactions with VMEs,[121] and the establishment of Protocols about deep seas fishery vessel encounters with VMEs.[122]

However, it ought to be noted that there are challenges within the VME management framework, as deficient or unavailable scientific data and inadequate systems of administration impinge upon their effectiveness in protecting and ensuring the sustainable exploitation of fisheries and their associated biodiversity.[123] In this regard, data-related actions are addressed in the Guidelines, like the improvement on collection and reporting activities, training programmes, stocks assessment, fishing impact assessment (including gear types, fishing areas, potential by-catch species, ecosystems baseline information, VMEs mapping), assessment and review of effectiveness of measures, among other matters.[124] Significantly, the FAO has generated a VME database aimed at facilitating the sharing of information and data on spatial management measures in deep sea fisheries in ABNJ.[125] At the time of writing, this database does not address high seas fisheries associated with the CRD. This is therefore a feature that can be incorporated into the CRD Agreement outlined in chapter 9. Importantly, in the particular case of the CRD initiative, the identification of VMEs will represent the establishment of such area-based management tool and associated protection measures like the ones detailed in the previous paragraphs. If the VME is identified under jurisdictional waters, the particular Central American country will be competent to apply such measures, but if the VME is located in the ABNJ of the CRD,

[117] FAO DSF Guidelines. 22
[118] Ibid. 35.
[119] Ibid. 33.
[120] Ibid. 34.
[121] Ibid. 33.
[122] Ibid. 34.
[123] FAO (2009) *Deep-sea fisheries in the high seas: Ensuring sustainable use of marine resources and the protection of vulnerable marine ecosystems*. Rome: FAO, 7.
[124] FAO DSF Guidelines. 19.
[125] FAO (2017) 'Vulnerable Marine Ecosystems Database. A global inventory of fisheries measures to protect vulnerable marine ecosystems in areas beyond national jurisdiction.' Available at: http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/

the IATTC, as the competent RFMO in the area, will be the competent body to adopt and implement the conservation measures.[126]

4.2.5 Blueprint for sustainability: FAO Code of Conduct for Responsible Fisheries[127]

This Code of Conduct, as its own name indicates, is a voluntary instrument adopted by the FAO Conference in Resolution 4-1995.[128] However, certain provisions are based on relevant rules of international law, including UNCLOS and related instruments.

The geographical scope of the Code is global, and its broad personal scope encompasses members and non-members of FAO, fishing entities, sub-regional, regional and global organisations, and individuals concerned with the conservation of fishery resources and management and development of fisheries.[129] The Code contains requirements that may have binding effect by means of other obligatory legal instruments, such as the FAO Compliance Agreement. The key value of this Code is that it provides principles[130] and standards[131] for the conservation, management and development of all fisheries, including capture, processing and trading activities, as well as aquaculture, research and the integration of fisheries into coastal area management.[132] Most importantly of all, the Code emphasizes that selective and environmentally safe fishing gear and practices should be used, in order to maintain biodiversity,[133] and that fisheries habitats should be protected.[134] As noted by Barnes,

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[126] The Antigua Convention contains different provisions on conservation and sustainable use of fish stocks, for example Articles 1, 4, 5, 7(1.c,d,f), 13(1), 20(1). These provisions will be addressed in further detail in Chapter 5.
[127] Code of Conduct for Responsible Fisheries. Adopted on 31 October 1995.
[128] For commentary see: J. Friedrich (2010) 'Legal challenges of non-binding Instruments: The case of the FAO Code of Conduct for Responsible Fisheries,' in A. von Bogdandy et. al. (eds.). *The Exercise of Public Authority by International Institutions* (Heidelberg; New York: Springer, 2010), 511-541. See also: G. Moore, 'The Code of Conduct for Responsible Fisheries', in Hey above n 58, 85-105; Y. Tanaka, *A Dual Approach to Ocean Governance: The cases of the zonal and integrated management in international law of the sea* (Farnham: Ashgate, 2008), 82; and W. R. Edeson (1996) 'The Code of Conduct for Responsible Fisheries, an introduction,' *The International Journal of Marine and Coastal Law, Vol. 11(2),* 233-238.
[129] Code of Conduct for Responsible Fisheries. Article 1.
[130] Ibid. Article 6.
[131] R. Long (2006) 'Review of the legal framework applicable to marine protected areas as a tool for ecosystem conservation and fisheries management.' European Union, Specific Targeted Research Project PROTECT. Copenhagen: DIFRES, 10-30.
[132] Code of Conduct for Responsible Fisheries. Article 10.
[133] Ibid. Article 6 (6).

the Code requires the "convergence of ecological and developmental paradigms for the management of fisheries and this approach if followed will undoubtedly improve the protection of biodiversity."[135]

Without overstating its importance, the Code has been a significant instrument that has influenced State practice within the Central American region in the adoption of fisheries conservation and management measures. In this regard, the Central American Fisheries and Aquaculture Organisation (OSPESCA) won the Margarita Lizárraga Medal,[136] for its contribution to the application of the Code of Conduct for Responsible Fisheries in a practical, tangible and sustainable way, providing significant support to sustainable fisheries and aquaculture development in the Central American countries.

4.2.6 Appraisal of fisheries instruments and governance arrangements

The review of the different multilateral instruments on fisheries management undertaken above points to some of the answers to the research questions posed in the introduction of this chapter. In doing so, the review advances some cogent evidence supporting the hypothesis that a CRD regional agreement ought to be formulated and implemented along the lines articulated in chapter 9. There appears to be six key strands to the arguments supporting the hypothesis outlined in chapter 1 as it pertains to the regulation of fisheries impacts on biodiversity in ABNJ.

Firstly, on the efficacy of existing fisheries instruments in protecting marine biodiversity, a challenging and complex picture comes into focus. One of the principal features is that there is a fragmented framework of international instruments and institutional arrangements governing the management of fisheries, which are largely focused on the optimal utilization of the resource and not on the wider objective of conservation and sustainable use of biodiversity. Furthermore, and as evident from the comprehensive analysis undertaken by Barnes, there is an absence of linkages between the different treaties and instruments to ensure their effective implementation in the conservation and sustainable use of biodiversity in ABNJ, with the learned scholar emphasising the

[134] Ibid. Article 6 (8).
[135] Barnes, above n 59, 554.
[136] FAO. Resolution 18/97. Adopted on 17 November 1997). See also: FAO (2017) *Margarita Lizárraga Medal Award*. Available at: http://www.fao.org/fao-awards/conference-awards/margarita-lizarraga/en/

need to "overcome current institutional limitations, where the decentralized nature of the international legal order presents particular challenges for the adoption of integrated approaches and the use of spatial or cross-cutting tools."[137] Like-wise, the single-species approach within tuna RFMOs in implementing management measures, rather than the effective application of the ecosystem approach, evidences a gap on achieving meaningful conservation measures for the protection of biodiversity in ABNJ. The latter's shortcoming is very much the case in relation to the management of tuna fisheries associated with the CRD, both within and beyond national jurisdiction.

Secondly, shortcomings and deficiencies in the implementation and compliance with existing legal obligations have been identified: the inadequate or partial impact assessments in deep-sea fisheries, failure to follow FAO guidelines, unresolved scientific uncertainties, restricted interpretation of VMEs, and no cumulative impact assessments. These are only some of the many limitations which impact directly the conservation and sustainable use of marine biodiversity in ABNJ.[138] It is important to highlight that an additional challenge occurs in Central America, where various coastal States and foreign fishing States have not ratified many of the multilateral international instruments governing fisheries. Likewise, the knowledge and data gap regarding the level of unsustainable fishing practices and IUU fishing in the region is a major concern that must be considered in a putative CRD Agreement, similar to the one outlined in chapter 9.

Thirdly, high seas fisheries and RFMOs have been subject to a high degree of criticism, much of it noting the need for further reform.[139] There is thus scope for further

[137] R. Barnes (2016) 'The proposed LOSC Implementation Agreement on areas beyond national jurisdiction and its Impact on International Fisheries Law,' *The International Journal of Marine and Coastal Law*, Vol. 31, 37.
[138] M. Gianni, D. Currie (2016) 'Conservation of deep-sea biodiversity in areas beyond national jurisdiction: A ten year review of the implementation of the UNGA Resolutions on bottom fisheries,' *Side event at the Second Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, 26 August – 9 September.
[139] On governance gaps see: K. Gjerde et. al. (2008) *Regulatory and governance gaps in the International regime for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction*. Switzerland: IUCN; K. Gjerde (2011),'High seas fisheries governance: Prospects and challenges in the 21st century' in D. Vidas, P. J. Schei (eds.), *The world ocean in globalisation: Challenges and responses* (The Netherlands: Martinus Nijhoff Publishers, 2011), 99–113; D. Freestone (2013) 'The final frontier: The Law of the Sea Convention and areas beyond national jurisdiction,' *U. C. Berkeley and the Korea Institute of Ocean Science and Technology Conference*. Korea, 21-24 May 2012, 1-15; D. Freestone (2016) 'Governance of areas beyond national jurisdiction: An unfinished agenda,' in J. Barrett,

improvement of the multilateral framework governing fisheries, with a view to advancing the conservation and sustainable use of biodiversity in ABNJ and the CRD. For example, States should be urged to cooperate at sub-regional, regional and global levels through fisheries management organisations, other international agreements or arrangements to promote conservation and management, and ensure responsible fishing. [140] In reinforcing cooperation and efficient synergies within fisheries management, a new BBNJ instrument could provide a "strong mandate for cooperative mechanisms within existing institutional regimes, particularly in relation to the ecosystem-based approach and the need to account for the impact of fisheries when assessing cumulative impacts on the marine environment."[141] Furthermore, the BBNJ process can enhance the functioning of RFMOs by calling on them to increase and fulfil their mandates through the implementation or enforcement of marine protected areas or other specific measures to protect biodiversity. Their effectiveness may be enhanced also by new consultation, coordination and reporting mechanisms. Currie suggest that they share a role with UNEP Regional Seas Organisations through the enhancement of co-operation models."[142]

Additionally, States could address the enhancement of fisheries management in the ABNJ part of the CRD through the development of general principles and the establishment of carefully structured cooperative mechanisms, following a similar approach to one advanced by the UNFSA.[143] Management and conservation measures at the regional level should be adaptive to the challenges and changing conditions of the marine environment and associated species in ABNJ. It must be remembered that the key elements drawn by ITLOS were coastal States have the primary responsibility for taking the necessary measures to prevent, deter and eliminate IUU fishing, and the flag State is liable only if it fails to meet its due diligence obligations to ensure that vessels flying its flag do not conduct IUU fishing activities in the EEZs of the other countries. [144]

R. Barnes (eds.), *Law of the Sea: UNCLOS as a Living Treaty* (London: BIICL, 2016), 231–265.
[140] O. Spijkers, A. Oude Elferink (2016) 'Potential for a new CMS Agreement on the European eel,' *First Range State Workshop on the European Eel*. Galway, Ireland: UNEP/CMS
[141] Barnes, above n 137, 34.
[142] Rodriguez, above 30.
[143] Barnes, above n 137, 34.
[144] *Definition of the minimum access conditions and exploitation of fisheries resources within the maritime zones under the jurisdiction of Sub-Regional Fisheries Commission (SRFC) Member States,* ITLOS Case No. 21 (Advisory Opinion) 2015.

Fourthly, from the review of the multilateral instruments briefly analysed above, there appears to be different elements that should be included in the design of conservation and management arrangements for the protection of biodiversity in the CRD, for example, taking into account the framework for application and operationalization of the precautionary approach developed in the UNFSA.[145] In this context, regional and high seas fishing States have important roles to play, as well as the FAO, which has a well-established history in establishing and assisting RFMOs in discharging their mandates including addressing discrete biodiversity issues such as the conservation of sharks.[146] Clearly, as will be seen in chapter 5, membership and coverage of the IATTC in the Eastern Central Pacific Ocean remains a problem, as well as the general performance of RFMOs as is evident from the results of the external reviews that have been conducted in recent years.[147] Participatory rights and decision-making procedures in many RFMOs are undermining their effectiveness and doing little for the conservation and sustainable use of biodiversity.[148]

Fifthly, on the specific challenges encountered in the CRD, there is a pressing need for a comprehensive approach including the establishment of cooperative arrangements of mutual assistance on a global, regional, sub-regional or bilateral basis.[149] This is another element to be considered within a CRD Agreement. More specifically, in regards to VMEs, the identification of such areas in the CRD would trigger specific management measures that must be taken to ensure that the ecosystem's integrity is not compromised,[150] including temporal and spatial restrictions or closures of areas to deep seas fisheries where VMEs are known or likely to occur,[151]changes in gear design or deployment or operational measures,[152] monitoring of all fishing effort, capture of species and interactions with VMEs,[153] and the establishment of Protocols about deep

[145] UNFSA, Article 6, Annex II, Annex II (6).
[146] An overview of shark-related measures adopted through RFMOs is available at the CITES website.
[147] C. Marika, S. Fagnani, J. Swan, K. Tamada, H. Watanabe (2012) *Performance reviews by Regional Fishery Bodies: Introduction, summaries, synthesis and best practices*. Rome: FAO. Fisheries and Aquaculture Circular Volume I (No. 1072).
[148] H. Ringbom, T. Henriksen (2017) *Governance challenges, gaps and management opportunities in Areas Beyond National Jurisdiction*. Washington: Global Environment Facility, 61.
[149] FAO Compliance Agreement. Article VII.
[150] FAO DSF Guidelines. 22
[151] Ibid. 33.
[152] Ibid. 34
[153] Ibid. 33

seas fishery vessels encounters with VMEs.[154] Depending on the location of potential VMEs in the CRD, a particular Central American country would be the competent to apply such measures if it is located within national waters, on the other hand, the IATTC would be the competent body to implement measures if the VME is identified beyond national jurisdictional.[155]

Finally, as pointed out previously in the context of the general discussion in chapter 3, cooperation and assistance between States and international organisations, including cooperation with financial assistance, development of human resources and the transfer of technology,[156] are other relevant elements contained in the UNFSA that could be replicated in the CRD Agreement. The exchange of information; the improvement on collection and reporting activities; training programmes; stocks assessment and VMEs mapping; just to mention a few data collection related action lines, could enhance the assessment and review of effectiveness of management and conservation measures in the future CRD governance scheme.[157]

4.3 IMO REGULATION OF NAVIGATION AND VESSEL SOURCE POLLUTION

Approximately 90 per cent of world trade by volume is carried by sea.[158] Associated environmental risks and impacts to ecosystems and vulnerable species from operational discharges, accidental or intentional contamination, physical damage to marine habitats, and collisions with marine mammals are just some of the threats posed by shipping. Likewise, noise pollution from shipping interrupts marine mammals' feeding and vocalisation, as they are impacted differently by varying noises, and this has even led to the abandonment of entire ocean areas by these populations.[159] "Indeed, one of the key features of the discrete regulatory regime that applies to shipping is that the IMO has moved beyond the regulation of traditional sources of pollution from ships,

[154] Ibid. 34.
[155] See Antigua Convention, above n 126.
[156] UNFSA. Part VII.
[157] FAO DSF Guidelines. 19.
[158] International Chamber of Shipping (2017) *Shipping and World trade*. Available at: http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade
[159] Rodgers, Woodall, Stewart, above n 37, 17.

such as oil or other hazardous substances, to address other marine environmental threats including most notably noise pollution." [160]

In light of this, the following section deals with navigation and the role of the International Maritime Organisation (IMO, hereafter) in the conservation of marine biodiversity. In particular, the section reviews briefly IMO area-based management tools and other existing instruments that are aimed at the protection and preservation of the marine environment from vessel source pollution, namely: Special Areas under MARPPOL (I, II, IV, V, VI); Particularly Sensitive Sea Areas (PSSAs); the London Convention and Protocol on Dumping and the contemporary issues of ocean fertilization and marine geo-engineering. First, however, the mandate of the IMO and some of its principal marine environmental instruments will be briefly outlined.

4.3.1 The International Maritime Organisation: Key global regulatory actor

The International Maritime Organisation was established at the United Nations Maritime Conference in 1948, [161] and is an intergovernmental organisation with competence in regards to the regulation of international shipping and navigation for safety, vessel source pollution, and maritime security purposes in the Law of the Sea Convention.[162] Subsequently, the IMO has continued to play a critical role in the progressive development and codification of international Law of the Sea. Indeed, international navigation rights under UNCLOS were one of the most contentious elements negotiated at the Third United Nations Conference on the Law of the Sea.[163] In this regard, UNCLOS established a balanced regime between the rights and jurisdictions exercised by coastal States in their maritime zones and the freedom of navigation enjoyed by all flag States.[164] The mission of the IMO is global in scope in

[160] See: C. Gomez et. al. (2016) 'A systematic review on the behavioural responses of wild marine mammals to noise: The disparity between science and policy,' *Canadian Journal of Zoology,* Vol. 94.
[161] E. McDonald (1948) 'Toward a World Maritime Organisation: A half-century of developments in ocean shipping,' *Department of State Bulletin*, Vol. 1.
[162] A. Chircop, 'The International Maritime Organisation,' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015), 417. See also United Nations Division for Ocean Affairs and the Law of the Sea (1996) 'Competent or relevant International Organisations under the United Nations Convention on the Law of the Sea', *Law of the Sea Bulletin*, Vol. 31, 79-95.
[163] Ibid.
[164] Ibid.

light of the worldwide nature of maritime trade.[165] Through its key functions on international maritime law making, the IMO provides a machinery for cooperation among governments in regulations and highest practicable standards,[166] maritime safety, efficiency of navigation and prevention and control of marine pollution from ships.[167] However, the IMO has been criticized because it has usually operated in a reactive manner to the regulation of vessel source pollution, all too frequently in response to maritime casualties such as the Amoco Cadiz and the Prestige.[168]

The IMO governance structure is relatively well streamlined and consists of an Assembly, a Council, a Secretariat and five Committees.[169] Currently it has over 170 member States, and representations from all United Nations members, flag, port and coastal States, intergovernmental organisations, and non-governmental organisations.[170] The IMO retains cooperative arrangements with numerous intergovernmental organisations,[171] as will be explored in more detail in chapters 6 and 7. Clearly it is beyond the scope of this thesis to examine in any great detail the entire IMO regulatory framework, comprised of over 50 international treaties. Accordingly, comments are thus focused on three specific instruments: MARPOL, the London Convention and Protocol, as well as spatial management measures in the form of special areas designated under MARPOL, Particularly Sensitive Sea Areas designated by the IMO (although none have been applied to the high seas), along with the adoption of permanent or seasonal routing measures for shipping under various IMO instruments. The latter are clearly germane to the CRD as they can mitigate the impacts of shipping on sensitive or fragile marine habitats and species in accordance with the objectives of a CRD Agreement.

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[165] Ibid. 419.
[166] With regard to technical regulations there is a close interplay between industry practices and IMO technical standards. Chircop, above n 162, 426.
[167] 1948 Convention on the International Maritime Organisation. Article 1(a).
[168] Chircop, above n 162, 436.
[169] The 5 Committees of IMO are: Maritime Safety Committee, Marine Environment Protection Committee, Legal Committee, Technical Cooperation Committee, and Facilitation Committee. IMO (2017) *Structure of IMO*. Available at: http://www.imo.org/en/About/Pages/Structure.aspx
[170] IMO (2017) *Member States, IGOs and NGOs*. Available at: http://www.imo.org/en/About/Membership/Pages/Default.aspx
[171] C. Allen (2009) 'Revisiting the Thames formula: The evolving role of the International Maritime Organisation and its Member States in implementing the 1982 Law of the Sea Convention,' *San Diego International Law Journal*, Vol. 10, 265, 271.

4.3.2 Preventing ship source pollution

The Convention for the Prevention of Pollution from Ships[172] (MARPOL) promotes the prevention of pollution of the marine environment by ships from operational or accidental causes,[173] defined therein as the deliberate, negligent or accidental release of oil and other harmful substances from ships constituting a serious source of pollution and a major threat to oceans.[174] A variety of tools are incorporated in this Convention, including regulations on certificates and inspections of ships,[175] detection of violations and enforcement,[176] and reports on incidents involving harmful substances.[177] It is important to highlight that MARPOL's provisions are further developed in six technical Annexes with the view to address comprehensively different types of pollution, namely: Annex I) Regulations for the prevention of pollution by oil,[178] Annex II) Regulations for the control of pollution by noxious liquid substances in bulk,[179] Annex III) Prevention of pollution by harmful substances carried by sea in packaged form,[180] Annex IV) Prevention of pollution by sewage from ships,[181] Annex V) Prevention of pollution by garbage from ships,[182] and the Annex VI) Prevention of air pollution from ships.[183]

Special consideration must be given to particular regulations in regards to the so-called 'special areas,' included in some of these Annexes. Such areas are defined as "sea areas where for recognized technical reasons in relation to its oceanographical and ecological condition and to the particular character of its traffic the adoption of special mandatory methods for the prevention of sea pollution by oil is required."[184] The designation of these special areas triggers specific measures that must be applied, like the prohibition of discharges of oil or oily mixture, chemicals and other substances in

[172] The Convention for the Prevention of Pollution from Ships. 1340 UNTS 184. Adopted on 2 November 1973. See also: A. Khee-Jin Tan, *Vessel source marine pollution: The law and politics of international regulation* (Cambridge: Cambridge University Press, 2006). Chapter 2.
[173] MARPOL. Article 1 (1).
[174] Ibid. Recital 2.
[175] Ibid. Article 5.
[176] Ibid. Article 6.
[177] Ibid. Article 8.
[178] Entered into force on 2 October 1983.
[179] Ibid.
[180] Entered into force 1 July 1992.
[181] Entered into force 27 September 2003.
[182] Entered into force 31 December 1988.
[183] Entered into force 19 May 2005.
[184] MARPOL. Annex I. Article 1, 10.

quantities or concentrations which are hazardous to the marine environment,[185] the prohibition of discharges of ballast water, tank washings, or other residues or mixtures containing such substances,[186] and the prohibition of disposal into the sea of all plastics, products which may contain toxic or heavy metal residues; and all other garbage.[187] However, a significant burden is posed to the proponents of these types of areas, as they "must prove that normal MARPOL ship discharges would be unacceptable in the light of the existing oceanographic and ecological conditions, which might be more difficult to prove in data poor and less trafficked ABNJ than in coastal areas,"[188] as it would be the case in the CRD.

In the Central American region, El Salvador,[189] Honduras,[190] Guatemala,[191] and Nicaragua[192] have ratified MARPOL. Furthermore, the current regulatory framework, in addition to the appropriate institutional framework established in these countries (in the form of Ministries for the management of maritime navigation),[193] provides a platform to address the prevention of pollution of marine ecosystems within maritime navigation activities.

Significantly, and as seen in chapter 2, the CRD occurs in a heavy shipping traffic area due to the location of the Panama Canal and its associated maritime routes. With this in mind, the designation of the CRD as a special area[194] within the framework of MARPOL could be included as one of the sub-designations to complement area-based management tools adopted under the CRD Agreement, with the view to address ship pollution and therefore having a spectrum of different management measures. Additionally, as a starting point, two technical Annexes could be applied in the CRD, namely Annex I including the adoption of special mandatory methods for the

[185] Ibid. Article 10.
[186] MARPOL. Annex II. Article 5.
[187] MARPOL. Annex V. Article 5.
[188] High Seas Alliance, above n 38, 4.
[189] Ratified on 24 September 2008.
[190] Ratified on 22 June 2001.
[191] Ratified on 3 November 1997.
[192] Ratified on 1 February 2001.
[193] Including the Ministry of Public Works and Transport of Costa Rica; the Department of Public Works, Transport and Housing of Honduras; the Ministry of National Defence of Guatemala; the Ministry of Transportation and Infrastructure of Nicaragua, and the Ministry of Public Works, Transport, Housing and Urban Development of El Salvador.
[194] D. Freestone, et. al. (2014) 'Place-based dynamic management of large scale ocean places: Papahānaumokuākea and the Sargasso Sea,' *Stanford Environmental Law Journal*, Vol. 33(2), 227.

prevention of sea pollution by oil, and Annex V on the prevention of pollution by garbage from ships. Importantly in this context, activities restrictions for special areas are very much contingent upon the nature of the activity in question. This again demonstrates that the new regional CRD regime will complement sector specific instruments governing vessel source pollution and that are subject to IMO procedural requirements prior to their adoption and implementation. As will be seen in chapter 8, ABMTs are under discussion in the BBNJ process and much of the negotiations have focused on issues such as designation, management and making flag States more accountable.

4.3.3 Combating dumping at sea: The London Convention and Protocol

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, or the London Convention, was one of the first multilateral instruments for the protection of the marine environment from human activities. [195] The Convention recognizes that the capacity of the oceans to assimilate wastes and regenerate natural resources is not unlimited,[196] and it aims to control and prevent marine pollution by prohibiting the dumping of waste likely to create hazards to human health or harm marine ecosystems and biodiversity.[197] Its amendments have been gradually broadening dumping prohibitions, which currently includes low-level radioactive wastes, [198] industrial wastes and incineration at sea.[199] Moreover, the London Convention prohibits the dumping of all wastes, except for those listed in Annex 1, which are permitted if they comply with conditions in Annex 2.[200] The personal scope of this international instrument applies to vessels and aircrafts registered in a State Party's territory or flying its flag.[201]

[195] Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. 1046 UNTS 120. Entered into force on 30 August 1975. See also: A. Sielen (2009) 'The new international rules on ocean dumping: Promise and performance,' *Geo International Environmental Law Review*, Vol. 21, 295.
[196] London Convention. Recital 2.
[197] Ibid. Article 1.
[198] Ibid. Annex I (6).
[199] Ibid. Annex I (10).
[200] Ibid. Article IV.
[201] Ibid. Article VII.

In regards to cooperation on the high seas,[202] the Convention calls for Parties collaboration to develop procedures to implement its regulations, including reporting of vessels and aircraft contravening the Convention.[203] In addition, and particularly important for the CRD, Parties with common interests to protect the marine environment in a given geographical area shall enter into regional agreements for the prevention of pollution, especially by dumping.[204] In 1976, a protocol to the Convention on the prevention of marine pollution by dumping of wastes and other matter[205] (London Protocol) with the aim of modernising and eventually replacing the Convention.[206] The Protocol prohibits all dumping, with some listed exceptions. Updating the Convention's provisions with a more comprehensive view, the Protocol introduces modern environmental principles such as the precautionary approach[207] and the polluters pay principle.[208] The Protocol also stipulates extensive prohibitions such as the incineration at sea, as well as the prohibition to export wastes to other countries for dumping.[209] The issuance of permits and reporting[210] are addressed in the Protocol, and it reinforces the importance of regional cooperation[211] in the same manner as the Convention. State responsibility for damage to the environment including the development of procedures regarding liability arising from the dumping or incineration at sea of wastes is included in article 15 of the Protocol.

As seen in chapter 2, concerns have been raised about ocean-engineering projects in the CRD along with emerging uses and technologies to address the effects of climate change. These are some of the regulatory challenges that fall within the scope of Annex I of the Protocol, which concerns carbon dioxide capture processes for sequestration.[212] Moreover, Parties to the London Protocol have agreed that the scope of work of the

[202] Ibid. Article VII (3).
[203] Ibid. Article VII.
[204] Ibid. Article VIII.
[205] Protocol to the Convention on the prevention of marine pollution by dumping of wastes and other matter. 36 ILM 1. Entered into force on 24 March 2006.
[206] London Protocol. Article 23.
[207] Ibid. Article 3 (1).
[208] Ibid. Article 3 (2).
[209] Ibid. Articles 5, 6.
[210] Ibid. Article 9.
[211] Ibid. Article 12.
[212] On the need for concrete standards to ensure the safe storage of carbon dioxide see: IPCC (2005) *Special Report on carbon dioxide capture and storage*. Cambridge: Cambridge University Press. See also: London Protocol. Annex 1 (1.8). However, it may only be considered dumping if the disposal is into a sub-seabed geological formation, and it must consist overwhelmingly of carbon dioxide and no waste should be added for the purpose of its disposal.

London Convention and its Protocol includes iron fertilization of the ocean.[213] In particular, Resolution LP.4 (8) on the Amendment to the London Protocol regulates ocean fertilization and other marine geo-engineering activities through the adoption of regulations on these emerging techniques. In doing so, it emphasizes that ocean fertilization and other types of marine geo-engineering should not be considered as a substitute for mitigation measures to reduce carbon dioxide emissions.[214] This measure demonstrated the "ability of Parties to the London Protocol to respond to new and emerging threats to the marine environment, including in ABNJ."[215]

In parallel, the Convention on Biological Diversity adopted Decision XI/20 on Climate-related geo-engineering,[216] and in a similar manner to the London Protocol, this Decision flags concerns in regard to impacts from marine geo-engineering on biodiversity and marine ecosystem services. Specifically relevant to such activities taking place in ABNJ, the Decision states that these techniques could represent significant adverse trans-boundary effects. The framework on marine geo-engineering is thus applicable to the CRD and three Central American countries have ratified the London Convention and its Protocol, namely: Costa Rica,[217] Guatemala[218] and Honduras.[219] Nevertheless, and in spite of the progress achieved in broadening the scope to prevent marine pollution, the London Convention and its Protocol "suffer from a long-term trend of declining reporting on all dumping activities. There is some support in the specialist literature that it is therefore very difficult to determine the extent to which these instruments are truly protecting the marine environment, including in ABNJ."[220]

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[213] IMO (2017) Ocean Fertilization under the London Convention and London Protocol. Available at: http://www.imo.org/en/OurWork/Environment/LCLP/EmergingIssues/geoengineering/OceanFertilizationDocumentRepository/OceanFertilization/Pages/default.aspx

[214] Resolution LP.4 (8). The Amendment introduces the definition of marine geo-engineering, as a "deliberate intervention in the marine environment to manipulate natural processes, including to counteract anthropogenic climate change and/or its impacts, and that has the potential to result in deleterious effects, especially where those effects may be widespread, long lasting or severe."

[215] High Seas Alliance, above n 38, 5.

[216] CBD. Decision XI/20. Adopted on October 2012.

[217] Ratified on 16 July 1986.

[218] Ratified on 14 July 1975.

[219] Ratified on 2 May 1980.

[220] High Seas Alliance, above n 38, 5.

4.3.4 Oil pollution casualties and other substances on the high seas

Oceans have a limited capacity to recover after oil pollution from maritime casualties, as this material remains in the deep sea, gets into the food web, reduces planktonic grazers, increases mortality of fish larvae and coral colonies, among other catastrophic consequences.[221] With this in mind, prevention should be always the first regulatory or management option. Significantly, the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties[222] establishes regulations to mitigate or eliminate grave and imminent danger to coastline or related interests from pollution or threat of pollution of the sea by oil, following a maritime casualty.[223] In this regard, coordination and collaboration, for example in the form of consultations and notifications between coastal States, flag States and the IMO are of crucial importance for having appropriate and efficient responsive actions to control and mitigate maritime casualties.[224] As seen in chapter 2, the Central American region is no stranger to this kind of casualty, given that the second major threat to biodiversity is the threat posed by pollution, including vessel source oil spills.[225] Therefore, appropriate mechanisms for the prevention or reaction to oil pollution casualties must be included in a putative Agreement for the CRD. Liability provisions are also set in this Convention, and if a Party has taken measures in contravention of the Convention and causes damage to others, it will be obliged to pay compensation to the extent of the damage caused by measures that exceed reasonable actions.[226] Additionally, the Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other than Oil[227] broadens the Convention´s scope and calls for Parties to take measures on the high seas to prevent, mitigate or eliminate the danger of pollution by substances other than oil

[221] Rodgers, Woodall, Stewart, above n 37, 17. See also: C. Fisher, P. Montagna, T. Sutton (2016) 'How did the Deep-water Horizon oil spill impact deep-sea ecosystems?,' *Oceanography*, Vol 29.
[222] International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties. UNTS 970. Entered into force on 6 May 1975. See also: Khee-Jin Tan, above n 172, chapter 6.
[223] Maritime casualty means a collision of ships, stranding or other incident of navigation, or other occurrence on board a ship or external to it resulting in material damage or imminent threat of material damage to a ship or cargo. Convention on Intervention on Oil Pollution Casualties in the High Seas. Article 2 (1).
[224] Ibid. Article 3.
[225] Center for Ocean Solutions (2009). *Pacific Ocean Synthesis: Scientific Literature Review of coastal and ocean threats, impacts, and solutions*. The Woods Center for the Environment, Stanford University. California, 34.
[226] Ibid. Article 6.
[227] Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other Than Oil. UNTS 1313. Entered into force on 30 March 1983.

following a maritime casualty.[228] The Protocol also specifies that these substances are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.[229] In the Central American region, just Nicaragua[230] is Party to this Convention and its Protocol. This is of concern given the volume of marine traffic that navigates through the CRD on the approaches to the Panama Canal. Accordingly, it is easy to conclude that the absence of ratifications to these regulatory measures are undermining the scope for responsive measures to oil casualties in the CRD area.

4.3.5 Mitigating shipping impacts: Particularly Sensitive Sea Areas

One of the contentious issues addressed in this study is the scope for the application of area-based management tools on the high seas with a view to protecting the conservation and sustainable use of biodiversity. The growth in global trade has consequently increased shipping activities and associated environmental hazards, such as accidental or intentional pollution, and damage to marine habitats, which remain common threats to the marine environment and its biodiversity including the unique marine ecosystem of the CRD.[231] To address these types of threats, the IMO's Marine Environment Protection Committee has developed the concept of ABMTs through the adoption of the Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas, which were agreed by IMO Assembly Resolution A.720 (17) in 1991. In the intervening years, additional IMO Resolutions A.885 (21), A.927 (22), and A.982 (24) further fleshed-out the regulatory regime associated with this ABMT.

As such, a PSSA is an area with recognized ecological, socio-economic, or scientific attributes, and which is in need of special protection through IMO actions, in light of the potential threats that are posed by international shipping.[232] Only IMO member Governments can apply for the designation and adoption of protective measures as a

[228] Ibid. Article 1 (1).
[229] Ibid. Article 1 (2.b).
[230] Date of accession 15 November 1994.
[231] IMO Assembly Resolution A.982 (24). *Revised guidelines for the identification and designation of Particularly Sensitive Sea Areas*. Adopted on 1 December 2005, 4.
[232] IMO, above n 227, 3.

PSSA. Coordinated proposals from two or more States with a common interest in a particular area to be designated as a PSSA are allowed under the regulatory framework.

To date, no PSSA has been designated for high seas areas. In principle however, there is nothing in the IMO Convention and the PSSA Guidelines that limit their application to sea areas under national jurisdiction and sovereignty. Accordingly, in relation to areas of the CRD that are both within and beyond national jurisdiction, the possibility remains open for two or more Central American countries to submit a proposal for a CRD specific PSSA to the IMO. In such an instance, the PSSA specific area should meet at least one of the criteria[233] listed in the Guidelines, and it could also be designated in areas beyond national jurisdiction. Further information would have to be submitted in the proposal for the designation of a PPSA in the CRD, such as evidence of potential damage caused by international shipping in the area, a history of collisions or spills in the area, stresses from other environmental sources, and if any measures are already in effect in the area.[234] Also, it can be argued that there is nothing in the IMO regulatory regime that impedes the adoption of the associated routing and reporting measures for a PSSA in high seas areas. However, a cautious approach needs to be adopted in complying with the PSSA requirements, and as it will be further explored in chapter 7 on the Sargasso Sea case study. In particular, there appears to be a conservative interpretation of the precautionary approach by the IMO, which requires evidence on how international shipping activities are causing damage to the marine environment.[235] Gathering such evidence is very difficult in remote areas of the high seas, and runs counter to the very conceptual nature of this normative principle.

PSSA designation entails the identification of the proposed area (i.e. location and threat of damage) and the associated protective measures.[236] For example, in relation to prevention of ship strikes with marine mammals, some countries have used tools like traffic separation schemes, such as the one established in the Bay of Fundy in North America, and also seasonal management areas to reduce lethal strikes with

[233] For example, ecological criteria (uniqueness or rarity, critical habitat, productivity); social, cultural, and economic criteria (social or economic dependency, cultural heritage): or scientific and educational criteria (research, baseline for monitoring studies). IMO, above n 227, 5, 6.
[234] Ibid. 8.
[235] Ibid.
[236] IMO, above n 227, 9, 10, 12.

cetaceans.[237] Furthermore, for obvious reasons associated with due publicity and dissemination, when a PSSA is designated, the protective measures must be identified on charts, and member Governments must ensure that ships flying their flag comply with the associated protective measures.[238]

4.3.6 Appraisal of navigation and measures and ABMTs

The framework addressing the prevention of marine pollution from the shipping industry has evolved from a narrow to a broader scope. For example, MARPOL provisions have six technical Annexes with the view to comprehensively address different types of pollution. In addition, through the past decades the IMO has created different tools to protect the marine environment and on the basis of evidence presented in chapter 2, it must be assumed that the CRD is a suitable candidate for IMO specific measures to reduce the environmental risks posed by shipping. Accordingly, the matters considered above in relation to the regulation of navigation can be summarised in four key points that are germane to the broader hypothesis advanced by this thesis regarding the need for a specialist regional regime for the CRD.

First, on the efficacy of existing maritime navigation instruments in protecting marine biodiversity, it should be acknowledged that UNCLOS set a balanced regime between the rights and jurisdictions exercised by coastal States in their maritime zones and the freedom of navigation enjoyed by all flag States. With this baseline, the IMO, as the competent global authority in maritime navigation, has been developing provisions to protect marine ecosystems from the impacts of international shipping. However, this organisation has been criticized due to the reactive manner in which has been addressing maritime casualties, rather than in a proactive and comprehensive way to deal with pollution challenges at sea.[239] Nevertheless, the IMO has developed a spectrum of tools that could be applied in ABNJ, and therefore in the CRD, provided

[237] Rodgers, Woodall, Stewart, above n 37, 12. See also: J. Hoop et. al., (2015) 'Vessel strikes to large whales before and after the 2008 ship strike rule,' *Conservation Letters*, Vol. 8, 24-32.
[238] Some examples of protective measures are: a) designation of an area as a Special Area under MARPOL Annexes I, II or V, or a SOx emission control area under MARPOL Annex VI; b) application of special discharge restrictions to vessels operating in the PSSA; c) adoption of ships' routing and reporting systems near or in the area, under the International Convention for the Safety of Life at Sea (SOLAS); and d) the PSSA may be designated as an area to be avoided or it may be protected by other ships' routing or reporting systems. IMO, above n 227, 8.
[239] Chircop, above n 162, 436.

that there is sufficient political support from IMO Member States and the shipping industry. For example, under MARPOL, the designation of a special area triggers specific measures that must be implemented. The designation of the CRD as a special area within this framework would address ship pollution and the possibility to apply a variety of measures. However, it must be acknowledged that a significant burden of proof is posed to the proponents of such areas in relation to the range of MARPOL ship discharges in such area, bearing in mind the lack of solid and available data from ABNJ.[240] Additionally from MARPOL, two technical Annexes could be applied in the CRD, namely Annex I including the adoption of special mandatory methods for the prevention of sea pollution by oil, and Annex V on the prevention of pollution by garbage from ships. The importance of the latter should not be underestimated in view of the scale of plastic pollution in the Eastern Central Pacific, as outlined in chapter 2. In parallel, it should also be borne in mind that the London Convention provides the option to establish regional agreements for the prevention of pollution, especially by dumping[241] among Parties with common interests to protect the marine environment in a given geographical area, which is a feature particularly relevant to be explored in a putative Agreement for the CRD. Furthermore, in light of new technological advancements, the London Convention and its Protocol have updated its scope with a more comprehensive view, introducing modern environmental principles and the consideration of emerging uses and technologies to address climate change. The London Protocol provisions apply to geo-engineering projects in the CRD area, assuming that they are conducted from vessels under the jurisdiction of a Contracting Party.

Secondly, in regards to the shortcomings in the implementation and compliance with existing legal obligations, particularly in the case of the London Convention and its Protocol, in spite of the progress achieved in broadening their scope to prevent marine pollution, a decline in the reporting on all dumping activities by their Parties may be taken as a shortcoming in its implementation and in commitments to ensure an effective regime. This is regrettable, as vessel source pollution, including oil spills, is the second major threat to biodiversity in Central America. Furthermore, countries within the region have been slow to ratify the different IMO multilateral instruments reviewed above. In addition, the entire regulatory scheme is contingent upon flag and

[240] High Seas Alliance, above n 38, 4.
[241] London Convention. Article 8.

port States in implementing IMO measures. The work of the IMO Sub-committee on the Implementation of IMO Instruments, as well as the results of IMO audit scheme are crucial to ensuring the future efficacy of the scheme.

Thirdly, the IMO has developed tools to address the protection of marine ecosystems. The Particularly Sensitive Sea Areas is an area-based management tool, which aims to protect special areas from the impacts of shipping. Guidelines have been established to direct the actions of States in proposing such areas and to implement the measures within the PSSAs. Relevant to the CRD is the possibility to submit coordinated proposals from two or more States, including most importantly States within the region, who share a common interest in a particular area to be designated as a PSSA. Nevertheless, even though there have been advancements on the PSSA framework, this ABMT is still mono-sectoral and designed to protect from vessel source pollution.[242] Also, it appears there appears to be a conservative interpretation on the precautionary approach in IMO, which requires evidence on how international shipping activities are causing damage to the marine environment,[243] which is very difficult to acquire in remote areas of the high seas such as the CRD. Crucially, a "PSSA can only be designated if the IMO has already adopted protective measures to address the identified threat and there are no precedents for such measures in ABNJ where maritime traffic is less intense than in other areas."[244] As a result, so far no PSSA has been designated in ABNJ. Even if Central American countries are successful in the utilisation of this instrument in ABNJ, difficulties may arise in relation to which States, apart from the flag State, should bear responsibility for ensuring compliance with routing or reporting measures.[245]

Fourthly, the discussions under the negotiation of a new BBNJ Agreement as well as the development of a regional arrangement for the CRD, as will be seen in chapters 8 and 9, provide "an opportunity to set up guiding principles, obligations and enhanced cooperation mechanisms that would improve and facilitate the implementation of

[242] D. Freestone (2016) 'Governance of areas beyond national jurisdiction: An unfinished agenda,' in J. Barrett, R. Barnes (eds.), *Law of the Sea: UNCLOS as a Living Treaty* (London: BIICL, 2016), 237.
[243] Ibid.
[244] High Seas Alliance, above n 38, 3.
[245] Unpublished Report of the International Conference on High Seas Governance Gaps and Challenges, 24-25 NUS Centre for International Law, Singapore, 5 (copy with Professor R. Long).

IMO's ABMTs, working in collaboration with other competent bodies. For instance, existing EBSAs and scientific criteria and data, when available, should be used to support the designation of new PSSAs and review the effectiveness of existing ones and their protected measures."[246] Additionally, the CRD Agreement could guide the strengthening of cooperation agreements and MoUs in place between the IMO and several sectoral bodies, such as the Food and Agriculture Organisation, the International Whaling Commission and the International Seabed Authority (ISA).[247]

4.4 REGULATING SEABED-MINING: NEED OR GREED?

The deep-sea floor covers about 60 per cent of the planet's surface,[248] and hosts unique geological environments, geomorphological features, ecosystems[249] and minerals. The long-standing and growing interest of the international community in marine minerals has led to the development of a legal framework to address seabed mining, which is currently in an exploratory phase, and it is envisioned that the exploitation of marine minerals would begin in the next decade.[250] As seen in chapter 2, the quantity of such resources and its associated economic value in the CRD and elsewhere remains uncertain due to the lack of data.[251] That said, minerals are associated with different habitats, including hydrothermal vents, seamounts and mid-ocean ridges. Consequently, the possibility of significant adverse impacts to the marine environment of the CRD from future mining activities, such as localized damage to the seafloor, discharges at the surface, disposal of tailings, removal of substrate habitats,[252] benthic disturbance, sediment plumes, noise and vibration, and changes in chemical characteristics of the water column,[253] are significant risks that must be taken in consideration in the design of regional arrangements for the protection of biodiversity.

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[246] High Seas Alliance, above n 38, 7.
[247] Ibid.
[248] A. Glover, C. Smith (2003) 'The deep-sea floor ecosystem: current status and prospects of anthropogenic change by the year 2025,' *Environmental Conservation*, Vol. 30 (3), 219–241.
[249] The Royal Society (2017) *Future ocean resources: Metal-rich minerals and genetics – evidence pack*. United Kingdom: The Royal Society, 12.
[250] Ibid. 6.
[251] Ibid. 12.
[252] M. Lodge, 'Protecting the marine environment of the deep seabed' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 153, 154.
[253] K. Mengerink, et, al., (2014) 'A call for deep-ocean stewardship,' *Science*, Vol. 344, 696-698; E. Barbier, et. al., (2011) 'Protect the deep sea,' *Nature*, Vol. 505, 475-477; C. Van Dover (2011) 'Tighten regulations on deep-sea mining,' *Nature*, Vol. 470, 31-33; J. Halfar, R. Fujita (2007) 'Danger of deep-sea mining,' *Science*, Vol. 316, 987.

Furthermore, as mentioned previously in light of scientific data regarding the distribution of marine minerals in the CRD, or in adjacent sea areas, there is a compelling case for the development of a region-specific approach to the contentious topic of seabed mining.

Under the Law of the Sea, the Area is composed of the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.[254] As will be explored in the following paragraphs, UNCLOS defines the Area and its non-living resources as the common heritage of humankind,[255] which is subject to protection under some general environmental provisions.[256] Therefore, activities in the Area must be carried out for the benefit of humankind as a whole,[257] a legal principle that constitutes the precondition for deep seabed mining.[258] As is well known, the exploitation of the resources of the Area is justified only if and to the extent that it serves the common interest of humankind, which is a peremptory rule of international law that has informed aspects of the BBNJ negotiations, as will be seen in chapter 8. Somewhat ironically, as noted in a recent publication, the benefits of seabed mining have been "consistently assumed but rarely questioned" by the international community, aside from the concerns voiced by non-governmental organisations and special interest groups.[259]

Against this background, this section will briefly review the institutional framework of the International Seabed Authority (ISA, hereafter) and the existing legal instruments and area-based management tools that are aimed at the protection of the marine environment from deep seabed mining activities in the Area.[260] All solid, liquid or gaseous mineral resources, could be explored or exploited[261] in situ in the Area at or beneath the seabed, including polymetallic nodules,[262] polymetallic sulphides and cobalt-rich crusts. In association with the right of exploration and exploitation of marine minerals, there is the duty to protect the marine environment. Consequently, the

[254] UNCLOS. Article 1.
[255] Ibid. Article 136.
[256] Ibid. Articles 136, 145, 192, 194, 209.
[257] Ibid. Article 140.
[258] A. G. Oude Elferink (2007) 'The regime of the area: delineating the scope of application of the common heritage principle and freedom of the high seas,' *International Journal of Marine and Coastal. Law*, Vol. 22, 143-176.
[259] K. Rakhyun (2017) 'Should deep seabed mining be allowed?,' *Marine Policy*, Vol. 82, 134.
[260] UNCLOS. Article 1.
[261] Ibid. Article 1.
[262] Ibid. Article 133.

legal framework for the protection of the marine environment from activities in the Area is contained in UNCLOS, the 1994 Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea,[263] and the rules, regulations and procedures adopted by the International Seabed Authority.[264] Specifically, Part XI of UNCLOS[265] provides the general legal framework applicable to the Area, and sets its governing principles, such as the common heritage of mankind,[266] the responsibility to ensure compliance and liability for damage,[267] benefit of mankind,[268] use of the Area exclusively for peaceful purposes, [269] marine scientific research, [270] transfer of technology,[271] the protection of the marine environment,[272] the protection of human life,[273] and participation of developing States,[274] among others.

Particularly relevant to the regime applicable to the Area, and as first proposed by Arvid Pardo in 1967 to the United Nations General Assembly,[275] all rights in the resources of the Area are vested in mankind as a whole, on whose behalf the International Seabed Authority acts.[276] Furthermore, the ISA has environmental protection powers for seabed mining activities affecting the Area,[277] and rules for the safeguard of the marine environment, based on the precautionary approach, have been adopted by the ISA and implemented by States and contractors carrying out exploratory mining activities.[278]

[263] 1994 Agreement Relating to the Implementation of Part XI of the UNCLOS of 10 December 1982. 1836 UNTS 42. Entered into force on July 28 1996.
[264] Lodge, above n 252, 151.
[265] United Nations on the Law of the Sea 1833 UNTS. 3/21 ILM 1261. Entered into force on 16 November 1994.
[266] Ibid. Article 136.
[267] Ibid. Article 139.
[268] Ibid. Article 140.
[269] Ibid. Article 141.
[270] Ibid. Article 143.
[271] Ibid. Article 144.
[272] Ibid. Article 145.
[273]Ibid. Article 146.
[274] Ibid. Article 148.
[275] T. Scovazzi, 'The deep seabed. Legal and political challenge,' in H. Smith, J. Suárez de Vivero, T. Agardy (eds.), *Routledge Handbook of Ocean Resources and Management* (New York: Routledge, 2015), 449.
[276] UNCLOS. Article 137 (2).
[277] Lodge, above n 252, 293.
[278] Ibid. 152

In addition, the first Advisory Opinion by the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea[279] in 2011 clarified critical elements on the regulatory framework established by ISA. Three key issues were addressed in particular: a) the obligation to apply the precautionary approach as an integral part of the due diligence obligations on sponsoring States; b) the application of best environmental practices in the activities taking place in the Area; and c) the obligation to conduct environmental impact assessments as an obligation under customary law.[280] In the application of best environmental practices in seabed mining, a range of measures are available for the mitigation of negative impacts, such as "protecting certain portions of the seabed as reference sites."[281] However, as also happens in land ecosystems, best practice can only address a fraction of the potential impacts, and a latent risk exists of significant harm that could occur.[282]

The Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 details other institutional arrangements and the requirements for the application of a plan of work for exploration in the Area.[283] Notably, the application has to be accompanied by an assessment of potential environmental impacts, and a description of a program for oceanographic and baseline environmental studies. [284] Specifically within the CRD, if a mining exploration or exploitation contract is issued in the Area, the rights and legitimate interests of the coastal States from Central America should be taken in consideration in respect to the activities conducted with resource deposits which lie across limits of national jurisdiction.[285]

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[279] *Responsibilities and Obligations of State Sponsoring Persons and Entities with Respect to Activities in the Area* (Advisory Opinion), International Tribunal for the Law of the Sea, Seabed Disputes Chamber, Case No. 17, 2011. See also: D. Freestone (2011) 'Advisory Opinion of the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea,' *ASIL Insights*, Vol. 15, 7; and R. Rayfuse (2011) 'Differentiating the common? The responsibilities and obligations of States sponsoring deep seabed mining activities in the Area' (2011) *German Yearbook of International Law*, Vol. 54, 459.
[280] Lodge, above n 252, 152.
[281] M. Lodge, et. al., (2014) 'Seabed mining: International Seabed Authority environmental management plan for the Clarion–Clipperton Zone: a partnership approach,' *Marine Policy*, Vol. 29, 66–72.
[282] Rakhyun, above n 259, 136.
[283] 1994 Agreement on the implementation of Part XI. Annex, Section 1.
[284] Ibid. Section 1 (7).
[285] UNCLOS. Article 142.

Due to its restricted mandate, the ISA appears to fall well short on the protection of biodiversity given that its jurisdiction only applies to the 'resources' in the Area, namely all solid, liquid or gaseous mineral resources in situ in the Area at or beneath the seabed.[286] Moreover, the framework established for the deep seabed beyond national jurisdiction is not mirrored with a globally competent institution for the protection of biodiversity and ecosystems in the high seas.[287] This particular legal and institutional gap will be further addressed in chapter 8. This shortcoming is compounded by the absence of regional arrangements for the CRD and is thus clearly linked to the core arguments underpinning the thesis as set out in chapter 1, as well as the putative regime advanced in chapter 9 including specific provisions on the applicability of provisions addressing the contentious issue of adjacency.[288] Additionally, in this context, it ought to be borne in mind that the ISA is specifically structured for seabed mining, for example, the composition of the Council responds to criteria relating to minerals usage and production.[289] As noted in one commentary: "constrained by its institutional design, the ISA has been entrenched in the mind-set of a developer rather than a custodian of the common heritage of humankind. It should be reminded that the ISA is not mandated to simply promote deep seabed mining, but more broadly to organize and control activities in the Area."[290]

In regards to benefits derived from the Area, the ISA is called to provide for the equitable sharing of financial and other economic benefits,[291] which should be carried out in accordance with a formal plan of work, in the form of a contract, attending the stipulations of Annex III UNCLOS.[292] However, as in so far no mining exploitation activity has started in the Area, the "ISA has yet to work out a payment mechanism and financial terms for mineral resources recovered from the Area, such as fees and royalties, and how humanity's share will be distributed globally."[293] There is some support for the view that benefits have so far been defined "exclusively in economic

[286] High Seas Alliance, above n 38, 3.
[287] Lodge, above n 252, 293.
[288] See Chapter 9.
[289] High Seas Alliance, above n 38, 3.
[290] Rakhyun, above n 259, 136. See also: UNCLOS. Article 153.
[291] UNCLOS. Article 140.
[292] Ibid. Article 153.
[293] For a recent development see ISA (2015) *Developing a regulatory framework for mineral exploitation in the Area: A discussion paper on the development and implementation of a payment mechanism in the Area for consideration by members of the Authority and all stakeholders*. Kingston: ISA.

terms, but social and environmental interests, especially those of future generations, deserve equal consideration."[294]

In regards to collaboration schemes, the Authority is also entitled to consult and cooperate with international and non-governmental organisations,[295] which could definitely improve the ABNJ governance framework including measures that apply in the CRD, increasing accountability and transparency, as well as technical advice, to the decision making process within the ISA. As will be seen in chapters 6 and 7, some regional case studies had already started coordination actions with the ISA through Memorandums of Understanding. Particularly of interest to a future CRD Agreement, and as it will be explored in chapter 9 of this study, is the consideration of establishing an MoU with the ISA, envisioned to coordinate efforts, promote marine scientific research and protect the marine environment in the ABNJ of the CRD, as a useful collaboration tool between the Authority and a putative CRD Commission. Again, this supports the hypothesis that regional arrangements are essential to the functioning of an effective regime to protect the unique biodiversity associated with the CRD in ABNJ.

In terms of responsibility and liability, provisions of Annex III of UNCLOS provide that the contractor shall be liable for the actual amount of any damage to the marine environment, arising from its wrongful acts or omissions. In addition, and as mentioned above, the Seabed Disputes Chamber[296] provided clarification on the extent of liability for sponsoring States and contractors. On capacity building and the transfer of marine technology, it should be borne in mind that it is an important component within the ISA framework, and the promotion of international technical and scientific cooperation by developing training, technical assistance and scientific cooperation programs in marine science and technology and the protection of the marine environment,[297] are key elements in this component. Finally, the 1994 Agreement further develops rules in

[294] R. Wolfrum (1983) 'The principle of the common heritage of mankind,' *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht*, Vol. 43, 312--337.
[295] UNCLOS. Article 169.
[296] See: D. French (2011) 'From the Depths: Rich pickings of principles of sustainable development and general international law on the ocean floor – the Seabed Disputes Chamber's 2011 Advisory Opinion,' *International Journal of Marine and Coastal Law*, Vol. 26(4), 525.
[297] UNCLOS. Article 144. See also 1994 Agreement on the implementation of Part XI. Annex, Section 5.

regards to production policy,[298] economic assistance,[299] and the financial terms of contracts.[300]

There are two further points for consideration in the context of the CRD, namely: the development of the Mining Code; and the spatial designation of areas of environmental interest.

As a starting point, it ought to be noted that minerals are a finite resource, and for some years now, the assumption that "increasing demand for metals will continue while the supply will peak and decline"[301] has been a central argument in the justification of advancing into deep seabed mining activities. To date, the ISA has approved twenty-six contracts, with a fifteen-year timeframe, for the exploration of deep-sea minerals in the Area.[302] The ISA Regulations are designed to implement the broad provisions of Part XI and Annex III of UNCLOS and the 1994 Agreement.[303] In doing so, the Authority is required to take necessary measures to ensure effective protection for the marine environment from harmful effects that may arise from activities in the Area.[304] Consequently, through the Mining Code, the ISA has established rules and procedures to regulate the exploration of marine minerals in the Area. Current regulations and decisions from the ISA cover polymetallic nodules,[305] prospecting and exploration for cobalt-rich crusts,[306] ferromanganese crusts[307] and polymetallic sulphides.[308] However, an evident shortfall is that these "mining regulations are fairly general and its provisions aimed at protecting the marine environment and do not refer explicitly to the conservation of species."[309]

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[298] Ibid. Section 6.
[299] Ibid. Section 7.
[300] Ibid. Section 8.
[301] See: R. A. Kerr (2014) 'The coming copper peak,' *Science*, Vol. 343, 722-724.
[302] Royal Society, above n 249, 13. See also: ISA (2016) *Deep seabed minerals contractors*. Available at: https://www.isa.org.jm/deep-seabed-minerals-contractors
[303] Lodge, above n 252, 157.
[304] UNCLOS. Article 145.
[305] ISA Assembly Decisions ISBA/19/A/12 and ISBA/19/A/9. ISA Council Decision ISBA/19/C/17.
[306] Regulations on Prospecting and Exploration for Cobalt-rich Ferromanganese crusts in the Area. ISA Assembly Decision ISBA/16/C/WP.2
[307] Regulations on Prospecting and Exploration for Cobalt-rich Ferromanganese Crusts in the Area. ISA Assembly Decision ISBA/18/A/11.
[308] Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area ISA Assembly Decision ISBA/16/A/12/Rev.
[309] R. Churchill, 'The LOSC regime for protection of the marine environment,' in R. Rayfuse (ed.), above n 252, 17.

Currently, the Authority is developing exploitation regulations, which would need to incorporate different essential elements and requirements to limit negative impacts in the marine environment, such as: "requirements for rigorous environmental impact assessments; regional management plans; area-based management; monitoring, evaluation and reporting; emergency response; supervision; and enforcement."[310] Consequently, no exploitation contracts will proceed until agreement on these requirements is reached at the ISA.[311]

In the process of developing such regulations, critiques have been made in relation to the logistical difficulties with the ISA being based in Jamaica, and also the closed-door practice taken by the ISA Legal and Technical Commission and the subsequent restricted participation of observers. Additionally, there is no scientific committee or environmental committee as such in the ISA framework, and therefore, technical and scientific rigorousness could be hampered.[312]

The second issue relates to the spatial environmental protection of the Area. As indicated at the beginning of this section, the deep-sea ecosystems are unique, fragile, biodiverse and provide valuable ecosystem services.[313] On the other hand, regional impacts from deep seabed mining include "lethal effects on the ecosystem and individuals, dispersion of sediment plumes, and possible bioaccumulation of metals in the ecosystem."[314] With this in mind, a number of decisions agreed within the ISA framework have developed recommendations in regards to specific areas of particular environmental interest (APEI, hereafter), another type of area-based management tool to be applied in the seabed area in ABNJ. Scholars have identified some of its relevant characteristics, such as being areas closed to mining, informed by the precautionary approach, and where regional biodiversity and representativity of ecosystem structures and functions shall be considered.[315] A concrete example of this ABMT is included in

[310] The Royal Society, above n 249, 24.
[311] Ibid.
[312] High Seas Alliance, above n 38, 3.
[313] T. Le, L. Levin, R. Carson (2016) 'Incorporating ecosystem services into environmental management of deep-seabed mining,' *Deep Sea Research Part II: Topical Studies in Oceanography*, Vol. 141.
[314] The Royal Society, above n 249, 24.
[315] K. Gjerde (2015) 'Beyond the horizon: Overview of current environmental governance in marine areas beyond national jurisdiction,' *Informal meeting to consider the environmental elements of a new international instrument for the conservation and sustainable use of marine biodiversity beyond national jurisdiction*. Costa Rica, 18-19 February.

the Environmental Management Plan for the Clarion-Clipperton Zone.[316] The management plan is informed by guiding principles such as the common heritage of mankind, the precautionary approach, the protection and preservation of the marine environment, prior environmental impact assessment, conservation and sustainable use of biodiversity and transparency.[317] It also emphasizes that best practice management involves spatial management tools, including the protection of areas that encompass a representative range of habitats, biodiversity and ecosystems.[318]

The APEIs operational objectives seek to protect biodiversity and ecosystem structure and functions, including a wide range of habitat types. The establishment of an APEI system would avoid the overlap with claimant and reserve areas, and would provide certainty to existing and prospective contractors by identifying the location of closed areas to mining activities.[319] Moreover, and in relation to the implementation of this management plan, data-related deficiencies have been recognised as a constraint for its efficient implementation, requiring partnership approach solutions.[320] Other important elements highlighted in the review of the management plan suggest keeping the current configuration of APEIs and the further engagement with the CBD-EBSA process.[321] Finally, the APEIs scheme is a valuable tool to be applied for the protection of the marine environment in the Area, however, a moratorium of deep seabed mining in the CRD should be the first option. In other words, "disallowing any extractive mining activities should remain available as an option,"[322] as the duration and magnitude of negative environmental impacts to the deep-sea habitat and its associated biodiversity remain unclear without further scientific monitoring and assessment programmes.

4.4.1 Appraisal of deep seabed mining and efforts to protect the marine environment

[316] ISA. Environmental Management Plan for the Clarion-Clipperton Zone. ISBA/17/LTC/7.
[317] Ibid. para. 13.
[318] Ibid. para. 21.
[319] Ibid. para. 39.
[320] Seascape Consultants (2014) *Review of Implementation of the Environmental Management Plan for the Clarion-Clipperton Zone. Report to the International Seabed Authority*, 1.
[321] Ibid. 19.
[322] Notably the ISA has power under UNCLOS to disapprove areas of exploitation in cases where substantial evidence indicates the risk of serious harm of the marine environment. UNCLOS Article 162(2)(x). See also M. Lodge (2011) 'Some legal and policy considerations relating to the establishment of a representative network of protected areas in the Clarion-Clipperton Zone,' *International Journal of Marine and Coastal Law*, Vol. 26, 463-480.

In a similar way to the precedent sections, three main research questions will be addressed.

Firstly, the Area of the CRD is not a prime target area for seabed mining activity. Reflecting the efficacy of existing instruments in protecting marine biodiversity, so far no exploitation of mineral resources in the Area has taken place elsewhere. The ISA has granted 26 exploration contracts in an envisioned preliminary phase of this activity. UNCLOS and the Part XI Agreement set the legal baseline for the evolving framework to regulate deep seabed mining. The ISA has also developed different provisions in the Mining Code and is currently developing norms and standards, which will have to address rigorous environmental impact assessments and monitoring requirements, to name just two relevant elements to be incorporated in the future legal instrument. Likewise, the Authority has created the concept of APEIs, a new tool in the already sectoral framework of ABMTs. As deep seabed mining is still on its first steps, the efficacy of instruments requires rigorous close scrutiny during the upcoming years.

Secondly, on shortcomings in the implementation and compliance with existing legal obligations, again, as the mining activities in the Area are not in place yet, such evaluation would have to be done in the upcoming years. However, in the overall legal and institutional frameworks, some challenges and shortcomings have been identified. For example, there is an evident uncertainty in the magnitude and duration of negative environmental impacts in the marine ecosystems and their associated biodiversity affected by deep seabed mining. Therefore, the critical role of the "precautionary approach and the need for regional scale testing of mining activity impact on the environment and ecosystem function over long timescales"[323] must be emphasized. Also, there are knowledge gaps and lack of data on the accurate determination of total amounts of metal and its recoverability.[324] Another example is the current development of legal provisions by the ISA, like the new exploitation regulations and thereafter, the global distribution of benefits payment mechanism and financial terms for mineral resources recovered from the Area. There is also a suspicion that least developed countries would barely feel any economic benefits,[325] and calls for questioning the

[323] The Royal Society, above n 249, 27.
[324] Ibid. 18.
[325] Rakhyun, above n 259, 135.

assumption that commercializing the Area will benefit all humankind.[326]

Thirdly, there is the scope for further reform of the multilateral framework with a view to improving the conservation and sustainable use of biodiversity in ABNJ and the CRD. Like in the previous sections on fisheries and navigation, cross-sectoral coordination and cooperation is a must for the ISA. As long as a fragmented and sectoral view governs the ISA framework, no effective conservation for biodiversity and marine ecosystems can be achieved. For example, in the potential scenario of the establishment of an MPA in the ABNJ of the CRD, it would require coordination between ISA, IMO, RFMOs and other international organisations with competence in ABNJ. In the same line of collaboration mechanisms, and specifically considering the CRD, a future CRD Commission could seek observer status by the ISA Assembly and establish an MoU to promote information sharing between the two entities, using the best scientific data available in the decision-making processes, along with environmental assessments and management of the risks posed by the potential development of seabed mining activities in the CRD.[327]

To conclude, a moratorium on deep seabed mining in the CRD should be the first option in a putative Agreement. In due regard to the precautionary approach, "commercial extraction of deep sea minerals must be delayed until the long-term pros and cons of deep seabed mining are scientifically scrutinized and democratically deliberated."[328] In addition, and as there is great uncertainty concerning the duration and magnitude of negative environmental impacts from mining to the deep-sea habitat and its associated biodiversity, the designating of the CRD entire area as an APEI, on a provisional basis, would ensure the adoption and implementation of a comprehensive environmental management plan to protect the marine environment of the CRD from harmful effects that may arise from exploration and exploitation activities in the Area. Likewise, further engagement with the CBD-EBSA process, and given that part of the CRD is already included in the Papagayo upwelling system and adjacent areas EBSA, future collaboration within both regimes could enhance conservation measures in the CRD.

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[326] Ibid. 134.
[327] Freestone, above n 194, 217.
[328] Rakhyun, above n 259, 136. See also: A. L. Jaeckel, *The International Seabed Authority and the Precautionary Principle* (Boston: Brill Nijhoff, 2017).

4.5 THE GROWING DEMAND FOR MARINE SCIENTIFIC RESEARCH

There is a critical need to better understand the marine environment, its biodiversity and the influence that human activities have on it. Marine scientific research provides data and knowledge, which could inform decision-making processes and further regulations to improve the conservation and sustainable management of marine resources and biodiversity in ABNJ.

Until the 1950 scientists were mostly free to move through the oceans without constraint.[329] Following the World Wars, technology innovations arose and a new spectrum of research activities started to develop in the ocean.[330] In addition, coastal States interests in offshore resources were noticeable, and they acknowledged that valuable information could come from marine scientific research.

4.5.1 United Nations Convention on the Law of the Sea

Marine scientific research was first considered during the first United Nations Conference on the Law of the Sea in 1958.[331] However, UNCLOS[332] does not contain a definition of marine scientific research (MSR, hereafter). Nevertheless, the Preamble of the Convention makes clear one of its purposes, which is to promote the study, protection and preservation of the marine environment,[333] a formulation that highlights the linkages between MSR and the conservation and sustainable use of marine resources.[334]

Building on this objective, Part XIII contains multiple provisions that aim to comprehensively regulate MSR. In the delicate balance between rights and duties that UNCLOS achieved, all States, irrespective of their geographical location, and competent international organisations, have the right to conduct marine scientific

[329] A. Soons (1977) 'The International Legal Regime for MSR,' *Netherlands International Law Review*, Vol. 24, 393.
[330] Ibid. 394.
[331] United Nations Division for Ocean Affairs and the Law of the Sea (2010) *Marine Scientific Research A revised guide to the implementation of the relevant provisions of the United Nations Convention on the Law of the Sea*. New York: United Nations.
[332] UNCLOS, above n 265.
[333] Ibid. Recital 4.
[334] Rothwell, Stephens, above n 5, 561.

research subject to the rights and duties of other States,[335] and they shall promote and facilitate the development and conduct of MSR.[336]

Likewise, UNCLOS established principles to guide the regulations on MSR, which shall be conducted exclusively for peaceful purposes,[337] with appropriate scientific methods and means,[338] not unjustifiably interfere with other legitimate uses of the sea,[339] in compliance with regulations on protection and preservation of the marine environment,[340] and shall not constitute the legal basis for any claim to any part of the marine environment or its resources.[341]

Following a zonal approach, Part XIII regulates MSR in accordance with the different maritime zones. Consequently, different rules apply to this activity if it is undertaken in the territorial sea,[342] in the exclusive economic zone or in the continental shelf.[343] For example, coastal States have the power to suspend or cease MSR carried out in their EEZ or continental shelf in the event of non-compliance of the agreed conditions.[344] In addition, within the correlation of Part XII and Part XIII of UNCLOS, a State has the possibility to apply more restrictive measures to MSR aimed at preventing pollution.[345] Other special provisions are applicable if the MSR is undertaken under the auspices of international organisations.[346]

Also, a variety of duties arise within the MSR framework, for example the duty to provide information to the coastal State,[347] the duty to comply with particular conditions[348] and the dissemination of information, as well as the flow of scientific data and transfer of knowledge specially to developing States,[349] are components that

[335] UNCLOS. Article 238.
[336] Ibid. Article 239.
[337] Ibid. Article 240 (a).
[338] Ibid. Article 240 (b).
[339] Ibid. Article 240 (c).
[340] Ibid. Article 240 (d).
[341] Ibid. Article 241.
[342] Ibid. Article 245.
[343] Ibid. Article 246.
[344] Ibid. Article 253.
[345] A. Hubert, 'Marine Scientific Research and the protection of the seas and oceans' in R. Rayfuse (ed.), above n 252, 318.
[346] UNCLOS. Article 247.
[347] Ibid. Article 248.
[348] Ibid. Article 249.
[349] Ibid. Article 244.

enhance the MSR regime.

As MSR provides a solid knowledge basis for informed management decisions,[350] international cooperation is a key element, and States as well as competent international organisations, are called to promote cooperation, through bilateral and multilateral agreements,[351] taking into account the sovereign rights of States and desire for mutual benefits, including information to prevent and control damage to the marine environment.[352] Moreover, States and competent international organisations are responsible for ensuring that MSR is conducted in accordance to UNCLOS,[353] and are liable for the measures they take in contravention of the Convention[354] or damage caused by pollution of the marine environment.[355]

Of particular interest for the present study are the regulations of UNCLOS applicable to MSR in ABNJ. In this regard, all States have the right to conduct MSR in the Area, in conformity with the provisions of Part XI,[356] and in the high seas. With the view to operationalize MSR provisions, the International Seabed Authority established an Endowment Fund in 2006 to promote and encourage the conduct of collaborative marine scientific research in the Area, by supporting the participation of qualified scientists and technical personnel from developing countries in MSR programs and activities.[357] In regard to marine scientific research in the water column beyond national jurisdiction,[358] it is important to recall that the freedom of scientific research is expressly referred to in the Convention as a freedom of the high seas.[359] Moreover, "MSR conducted on the high seas or in the Area is subject to the 'due regard' requirements, respectively, such that the freedom must be exercised by taking into account the interests of other States in the exercise of their freedoms of the high seas and in the Area. Such interests would include, *inter alia*, the protection and preservation of the marine environment in these marine areas beyond national

[350] A. Hubert, above n 345, 335.
[351] UNCLOS. Article 243.
[352] Ibid. Article 242.
[353] Ibid. Article 263 (1).
[354] Ibid. Article 263 (2).
[355] Ibid. Article 263 (3).
[356] Ibid. Article 143, 256.
[357] DOALOS, above n 331.
[358] UNCLOS. Article 257.
[359] Ibid. Article 87.

jurisdiction."[360]

An additional element should be considered when reflecting on MSR. The transfer of marine technology is a necessary supporting factor for the conduct and promotion of research. Part XV of UNCLOS reinforces the importance of cooperation for the development and transfer of marine technology.[361] In this regard, States are called upon to promote the development of marine scientific and technological capacity with regard to the exploration, exploitation, conservation and management of marine resources.[362]

Also, States shall encourage the acquisition, evaluation and dissemination of marine technological knowledge and facilitate the access to such information and data,[363] as well as the development of marine technology and human resources through training and education of nationals of developing States.[364]In order to achieve these objectives, States are called to establish programs of technical cooperation for the effective transfer of marine technology; promote favourable conditions for agreements and arrangements; as well as promote the exchange of scientists and foster joint ventures.[365]

4.5.2 IOC Criteria and Guidelines for the Transfer of Marine Technology

Regrettably, the implementation of the relevant provisions in UNCLOS on MSR, capacity building and transfer of marine technology (TMT, hereafter) remains largely unsatisfactory from a practical perspective and creates a serious challenge for developing States in implementing the Convention and deriving economic and environmental benefits from offshore resources.[366]

Nevertheless, international organisations such as the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO, hereafter), [367] the primary organisation

[360] Hubert, above n 345, 329.
[361] UNCLOS. Article 266.
[362] Ibid. Article 266 (2).
[363] Ibid. Article 268.
[364] Ibid. Article 268 (a),(b).
[365] Ibid. Article 269.
[366] See: Tanaka, above n 1, 370–75.
[367] Established in 1960 through UNESCO's 11th General Conference. IOC Statutes. Article 2.1

responsible for marine science in the United Nations system,[368] has been developing a framework to operationalize UNCLOS provisions on MSR, capacity building and TMT. Specifically, the Criteria and Guidelines for the Transfer of Marine Technology[369] acknowledges that marine technology[370] includes more than physical infrastructure, but also access to data and information, manuals, guides, standards and best practices.[371] Moreover, the Guidelines calls for TMT to be conducted on fair and reasonable terms and conditions, and should enable the Parties concerned to benefit on equitable basis. [372] Additionally, IOC has highlighted that TMT plays a key role in the development of countries, and particularly in developing countries, including through the exploitation and exploration of marine resources, navigation safety, the preservation of the marine environment andthe prevention of ocean-related hazards.[373]

In addition, IOC has a mandate as a clearing-house for transfer of marine technology, as well as on training and capacity development. Further developments within the IOC framework such as the Ocean Biogeographic Information System (OBIS),[374] has been identified as an effective global platform, involving a network of national authorities for the sharing of research data and information.[375]

Specifically relevant for the CRD initiative, all the Central American countries[376] are members of UNESCO, and the role of the IOC and the Guidelines on TMT should inform MSR, capacity building and TMT action lines within a putative management scheme in this area.

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[368]UNCLOS. Annex 8. Article 2 (2).
[369] UNESCO (2003) *IOC Criteria and Guidelines on the Transfer of Marine Technology*. Available at: http://www.scor-int.org/SCOR_CB/CB-Bremen/IOC_Tech_Transfer.pdf The IOC has also published a paper on its potential contribution to a new instrument under UNCLOS on the protection of biodiversity; see: IOC/INF-1338, 17 May 2016. Available at: http://ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=17286
[370] Marine technology refers to instruments, equipment, vessels, processes and methodologies required to produce and use knowledge to improve the study and understanding of the nature and resources of the ocean and coastal areas. Ibid.
[371] Ibid. 1.
[372] UNESCO. IOC Brochure 2014-3, 2.
[373] Ibid. 1.
[374] UNESCO (2002) *IOC-Ocean Biogeographic Information System*. Available at: http://www.iobis.org
[375] UNESCO, above n 369, 1.
[376] All Central American countries are members of UNESCO and Parties to the Constitution of the United Nations Educational, Scientific and Cultural Organisation: Guatemala (1 February 1950), El Salvador (28 April 1948), Honduras (16 December 1947), Nicaragua (22 February 1952), Costa Rica (19 May 1950).

4.5.3 Appraisal on MSR provisions in ABNJ

As seen above, UNCLOS provides a broad legal basis to facilitate and cooperate in MSR. Moreover, MSR provides scientific information, which is necessary to guide and inform decision-making processes that enhance marine conservation in ABNJ. "Furthermore, the legal regimes in UNCLOS for MSR in Part XIII and for the protection and preservation of the marine environment in Part XII are not static, and each influences the progressive development of the other."[377]

Regrettably, shortcomings in the implementation of these relevant provisions on MSR, capacity building and TMT let them remain largely unsatisfactory from a practical perspective and creates a serious challenge for developing States in implementing the Convention and deriving economic and environmental benefits from offshore resources.[378]

Further collaboration, the establishment of MoUs or cooperation agreements, sharing of information and the consolidation of clearing house mechanisms are only a few examples on how UNCLOS provisions on MSR could be put in practice. Moreover, in the Central American region, all countries would certainly benefit from the strengthening of existing capabilities and capacities, as well as improvement in funding, and greater engagement with public and private scientific bodies.[379]

Within the BBNJ negotiations, capacity building and technology transfer are two key elements under discussion as will be seen in chapter 8. In this regard, MSR, capacity building and TMT regimes could be enhanced through the adoption of meaningful and tangible measures, the establishment of a global financing mechanism and an ad hoc

[377] Hubert, above n 345, 334.
[378] See Tanaka, above n 1, 370–75.
[379] IISD (2016) 'Summary of the first session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(106), 14-16. See also: IISD (2016) 'Summary of the second session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(118), 13, 14; and IISD (2017) 'Summary of the third session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25 (129), 9-11.

body with responsibility for coordination and prioritisation of capacity building and TMT measures.[380]

4.6 CONCLUSIONS

The review of the different multilateral instruments on fisheries management, maritime transportation, seabed mining and marine scientific research, points to some of the answers to the research questions posed in the introduction of this chapter. Thus, the review advances evidence supporting the hypothesis outlined in chapter 1 of this study that a CRD regional agreement ought to be established for the effective conservation of the marine biodiversity in the ABNJ of the Dome.

It has been emphasized that the existing sectoral instruments regulating activities on fisheries, navigation, seabed mining and marine scientific research are not effective in protecting marine biodiversity in ABNJ, as such instruments and bodies do not have a clear and strong mandate for the conservation of the marine environment and its associated living and non-living resources in ABNJ. Throughout the chapter, several shortcomings and deficiencies in each of the sectors have been identified, clarifying the need for an integral and comprehensive treaty for the conservation and sustainable use of marine biodiversity in ABNJ, as well as a comprehensive regional instrument for the CRD. Unfortunately, as seen above, there is a poor history of ratification of fisheries instruments by Central American countries. Moreover, IUU fishing has been identified as a relevant threat for securing long-term fish stocks in the Central American Pacific, as well as causing adverse consequences for the people who depend on them. Given that fishing activities within the CRD is largely the high seas, port State measures are a key tool to address in a putative management scheme for the CRD.

Given this fragmented framework, or even significant lacunae, of international instruments and institutional arrangements governing the management of marine resources in ABNJ, added to the absence of linkages between the different treaties and instruments to ensure their effective implementation in the conservation and sustainable use of biodiversity in ABNJ, there is a scope for further improvement of the multilateral framework governing the activities taking place in ABNJ.

[380] IISD (2016) 'Summary of the first session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' above n 379, 15, 16.

For example, cross-sectoral coordination and cooperation is a must for the different regional and international bodies involved in fisheries, navigation, seabed mining and marine scientific research. As long as a fragmented and sectoral view governs these frameworks, no effective conservation for biodiversity and marine ecosystems can be achieved. Therefore, there is a pressing need for a comprehensive approach including the establishment of cooperative arrangements of mutual assistance on a global, regional, sub-regional or bilateral basis. Specifically for the CRD, this element will be further examined in chapter 9.

Likewise, from the review of the multilateral instruments in this chapter, different elements should be included in the design of conservation and management arrangements for the protection of biodiversity in the CRD. The possible establishment of ABMTs to protect biodiversity and the marine environment effectively in the ABNJ of the CRD is a way forward. For example, since part of the CRD is already included in the Papagayo upwelling system and adjacent areas EBSA, further engagement of international bodies and their respective ABMTs (FAO/VME, IMO/PSSA, ISA/APEI) with the CBD/EBSA process would certainly enhance collaboration between these regimes and improve conservation measures in the CRD. Furthermore, area-based management tools such as VMEs could be established in the CRD, which could lead to the adoption of protection measures. If the VME is identified under jurisdictional waters, the specific Central American country will be the one to apply the measures, but if the VME is located in ABNJ, the Inter-American Tropical Tuna Commission, being the competent RFMO in such area, will be the competent organisation to adopt such conservation measures. The recognition of special areas due to their oceanographical and ecological conditions, and the subsequent adoption of special measures for the prevention of pollution is contained in different international instruments such as MARPOL and the Guidelines for the Designation of PSSA. These measures are addressed in chapter 9.

A key finding from the analysis in this chapter is the recommendation of a moratorium on seabed mining. Furthermore, in the absence of such a prohibition, if a mining exploration or exploitation concession were given within its area in ABNJ, the rights and legitimate interests of the coastal States from Central America should be taken in consideration in respect of the activities conducted with resource deposits in the Area which lie across limits of national jurisdiction.

Finally, in light of the deficit of scientific knowledge regarding the distribution and functioning of the biodiversity associated with the CRD highlighted in chapter 2, the significant role of MSR providing scientific information can't be emphasized enough. It is necessary to guide and inform decision-making processes that enhance marine conservation in the ABNJ of the CRD. Further collaboration, the establishment of MoUs or cooperation agreements, sharing of information and the consolidation of clearing house mechanisms are only a few examples of how MSR could be put into practice in a new CRD Agreement.

CHAPTER 5. REGIONAL INSTRUMENTS AND INSTITUTIONS: GENESIS OF A *LEX SPECIALIS* APPROACH TO THE CRD

5.1 INTRODUCTION

The Eastern Central Pacific is the subject of complex legal and governance arrangements with diverse mandates in relation to ocean resources and their associated biodiversity. The present chapter addresses one specific research question, namely: are there regional legal and institutional frameworks applicable to marine conservation and sustainable use of marine resources in the Central American region, which if applied in an effective manner could form the backbone of efforts to improve the protection and management of CRD biodiversity in ABNJ? This is central to the hypothesis outlined in chapter 1, which is that a region-specific approach is necessary to protect and conserve the unique biodiversity of the CRD. In other words, can existing regional instruments and institutions act as a legal plinth for the development of the *lex specialis* regulatory regime that is advanced in chapter 9? The answer to this question is significant because the genesis of the new marine environmental protection scheme will not evolve in a vacuum but will reflect the *realpolitik* of social, economic and environmental considerations of the countries within the region.

In light of the foregoing, the following discussion will describe the general political backdrop focusing on the Central American Integration System (SICA, hereafter), followed by an examination of the institutional and legal framework from a regional perspective, analysing the competences of three regional bodies within the SICA, as well as the Regional Fisheries Management Organisation for the Eastern Tropical Pacific, with a view to evaluating their respective competences to regulate and improve marine conservation and the sustainable use of marine resources associated with the CRD.

5.2 POLITICAL BACKDROP

The study of regional arrangements is deeply intertwined with the democratic political processes and the institutional structures of the government of the coastal States. Moreover, in considering the aforementioned question, it is important to keep in mind

the political and historical context of the Central American region during the decade of the 1980s, when the region was characterized by civil wars and military conflicts.[1] During this period, the Central American countries signed the procedure for the establishment of a firm and lasting peace in Central America, also known as the Esquipulas II Agreement.[2] Furthermore, these countries decided to establish an integrated system to address common interests and concerns in the belief that coordinated agendas and cooperation would foster greater regional cooperation. The Tegucigalpa Protocol[3] established the Central American Integration System (SICA, for its acronym in Spanish), which includes Panama[4] in the new institutional framework of the Central American region. Afterwards, Belize joined as a full member of SICA in 2000,[5] the Dominican Republic became an associate of this integration system in 2004, and other observers have joined SICA since.[6] The primary objective of the Tegucigalpa Protocol was to bring about greater political and economic integration[7] of Central America as a region of peace, freedom, democracy and development.[8] In addition, the SICA seeks to promote sustained development, the protection of the environment,[9] and the strengthening of a regional system of well-being, including economic and social justice for the peoples of Central America.[10]

Specifically on the environmental component, the Tegucigalpa Protocol calls for the adoption of concerted actions to protect the environment, while ensuring balanced development and the rational exploitation of the natural resources of the area.[11] In this regard, actions to improve the conservation of CRD marine biodiversity fit well within

[1] J. Gould, C. Eichstedt (2014) 'Revolution and Reaction in Central America,' *Oxford Bibliographies in Latin American Studies*.
[2] UN Doc. A/42/521-S/19085, 31 August 1987. Measures included in these Procedures comprise the promotion of national reconciliation, end to hostilities, democratization, free elections, the termination of all assistance to irregular forces, negotiations on arms controls, and assistance to refugees, among other matters.
[3] Tegucigalpa Protocol to the Charter of the Organisation of Central American States. 1695 UNTS 382. Entered into force on 23 July 1992. This Protocol amended the Charter of the Organisation of Central American States (OCAS) No. 8048. Signed at Panama City on 12 December 1962.
[4] Ibid. Article 1.
[5] Belize became a member of SICA on the 27 of November 2000.
[6] Some observers within the SICA framework are Brazil, Argentina, Mexico, Chile, United States of America, Spain, Japan, Germany, among others. SICA (2017) *Member States and observers*. Available at: http://www.sica.int/miembros/miembros.aspx
[7] Tegucigalpa Protocol. Article 2.
[8] Ibid. Article 3.
[9] Ibid. Article 3 (b).
[10] Ibid. Article 3 (d).
[11] Ibid. Article 3 (i).

the overall thrust of this general objective. Accordingly, it is pertinent to this study to briefly review the institutional structure[12] of the SICA, which is comprised of a Meeting of Presidents, the Council of Ministers, the Executive Committee, and the General Secretariat. The functions of each institution are set out in the Protocol.[13] Crucially, the SICA is legally entitled to carry out its functions at the international level and in each of its Member States,[14] as well as to conclude treaties or legally binding agreements with third States or organisations.[15] This gives SICA the legitimacy to further improve conservation goals with other regional entities or global agencies, which could be of significant value in advancing a new CRD Agreement to ensure regional protection of biodiversity in areas of the CRD beyond national jurisdiction, as a crucial corollary to the obligation to protect the marine environment and conserve marine resources under international and customary law.

5.2.1 General framework for the protection of biodiversity within national jurisdiction in Central America

Central America is a geographical region rich in biodiversity, with some estimates suggesting that it comprises as much as 8 per cent of global biological diversity, distributed in 206 ecosystems.[16] The region constitutes approximately 12 per cent of the coastal area of Latin America and the Caribbean.[17] In the context of protecting the marine environment and the sustainable use of its resources, the SICA framework has established legal instruments and institutional arrangements that require careful review.

Perhaps the most notable feature of the environmental regional legal framework is the Convention for the Conservation of the Biodiversity and the Protection of Wilderness Areas in Central America.[18] This Convention emphasizes the need to establish mechanisms of regional cooperation for the sustainable use of the environment, given

[12] Ibid. Article 12.
[13] Ibid. Articles 13-28.
[14] Ibid. Article 30.
[15] Ibid. Article 31.
[16] CCAD (2014) *Regional Environmental Strategy 2015-2020.* El Salvador: CCAD. 8
[17] Ibid.
[18] Convention for the Conservation of the Biodiversity and the Protection of Wilderness Areas in Central America. Entered into force on 20 December 20 1994. The following countries have ratified this instrument: Costa Rica (December 12, 1994), El Salvador (May 19, 1994), Guatemala (October 22, 1993), Honduras (February 21, 1995), Nicaragua (January 12, 1996) and Panama (May 26, 1995).

the intimate interdependence within the Central American countries,[19] and stresses the fundamental importance to conserve natural habitats *in situ* and *ex situ*.[20] The main objective of this Convention is to ensure the conservation and sustainable use of biodiversity in the Central American region.[21] In addition, it highlights that the creation, management and strengthening of protected areas plays a vital role in ensuring the essential ecological processes and rural development.[22] Specifically for the putative CRD Agreement outlined in chapter 9, the consolidation of *in situ* conservation tools and strategies are crucial to ensure the protection of biodiversity.

Crucially, the countries that are Parties to this instrument are obliged to guarantee that activities within their jurisdiction or control do not cause damage to the biodiversity of their territory, or in areas that limit their national jurisdiction.[23] In this regard, biodiversity conservation in trans-boundary habitats requires regional and global cooperation, in addition to national efforts.[24] The establishment of management measures for the protection of biodiversity in the CRD could be covered by this mandate in areas within national jurisdiction, and also as a manner of implementing the duty to cooperate and coordinate, a well-established guiding principle in international law.[25]

The Convention recognizes the importance of the efficient management of protected areas within the Central American region, as well as the benefits from research and development of bio-derived materials which should be made available to society as a whole.[26] Furthermore, the instrument states that the access to genetic material, substances, products derived from them, the related technology, and conservation will be open under the jurisdiction and control of States within mutual Agreements established with recognized bodies.[27] One can identify elements regarding access and benefit sharing that are highlighted further in this study in the context of the proposed framework for marine genetic resources discussed in chapter 8.

[19] Ibid. Recital 1.
[20] Ibid. Recital 5, article 4.
[21] Ibid. Article 1.
[22] Ibid. Recital 8.
[23] Ibid. Article 2(b).
[24] Ibid. Article 3.
[25] Chapter 9.
[26] Ibid. Article 6.
[27] Ibid. Article 8.

The Convention calls for States to develop their own conservation strategies, giving priority to the establishment of protected areas.[28] Additionally, it sets out responsibilities for the Central American Commission on Environment and Development (CCAD, for its acronym in Spanish) with a view to strengthening the Central American system of protected areas,[29] as well as the task to develop updated lists of protected areas, threatened species and habitats.[30] The latter is a common feature that the SICA framework has with other marine regional structures to protect marine biodiversity, as will be seen in chapters 6 and 7. All these provisions, which are only applicable within national jurisdictions, are strictly related with the CRD initiative and could play a significant role interacting with a putative Agreement for the conservation of its biodiversity. They thus form a fundamental stand in the legal plinth underpinning an integrated regional approach to the CRD.

5.2.2 Combatting climate change by means of the Regional Convention on Climate Change[31]

The Central American region is known for being home of natural richness and biodiversity. However, the challenges posed by poverty and social deficits make these countries especially vulnerable to the adverse effects of climate change. For example, the region is exposed to climate phenomenon such as intense rains, storms, severe droughts, cyclones and the El Niño Southern Oscillation (ENSO).[32] The later, as seen in chapter 2, directly impacts the geographical area and temporal variations of the footprint of the CRD. Furthermore, the IPCC Fifth Report[33] pointed out a wide range of climatic effects in Central America, including changes in temperature and sea level, coral bleaching, among others.[34]

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[28] Ibid. Article 14.
[29] Ibid. Article 20.
[30] Ibid. Article 36.
[31] In close relation to this Regional Convention, the following Central American countries have ratified the Paris Agreement: Costa Rica, El Salvador, Guatemala, Honduras, Belize and Panama. UNFCCC (2017) *Paris Agreement status of ratifications*. Available at: http://unfccc.int/paris_agreement/items/9444.php
[32] CCAD, above n 16, 9.
[33] Intergovernmental Panel on Climate Change (2015) *Climate Change 2014: Synthesis Report.* Switzerland: IPCC, 7.
[34] Ibid. 1.

Given the vulnerabilities within the region, partners to SICA developed the Regional Convention on Climate Change.[35] This instrument requires State Parties to take conservation measures and cooperate within regional actions on climate change,[36] in conjunction with the CCAD and the Central American Council on Climate Change (CCCC).[37] Significantly, in the context of technology transfer in chapters 8 and 9 below, this Convention calls for cooperation from the international community to facilitate the access and transfer of technology aimed at reducing the gaps between developed States and the Central American countries.[38] Furthermore, a Regional Strategy on climate change[39] enhances these legal provisions, including strategic actions to address coastal and marine resources. Thus for example, the Central American countries are encouraged to improve knowledge[40] and create alliances with specialized international research centres to understand the effects of climate change on marine ecosystems and marine biodiversity.[41] Specifically, regarding the latter, the CRD Agreement outlined in chapter 9 could be informed by the scientific information provided by these alliances and advance decision-making processes and action lines to better address the challenges posed by climate change on the Dome, such as ocean acidification, variability of water temperatures, relocation of species and the subsequent changes to the marine environment, among other matters.

5.2.3 Protecting vulnerable chelonians: the Inter-American Convention for the Protection and Conservation of Sea Turtles

One aspect of the hypothesis outlined in chapter 1 is that an integrated regional approach needs to be adopted in respect to unique biodiversity associated with the CRD. Another legal instrument applicable to the biodiversity benefiting from the CRD is the Inter-American Convention for the Protection and Conservation of Sea Turtles.[42] This Convention recognizes that these species are subject to capture, injury or mortality as a result of human related activities;[43] and given that they migrate widely throughout

[35] Central American Convention on Climate Change. Signed on 29 October 1993.
[36] Ibid. Article 9.
[37] Ibid. Article 19.
[38] Ibid. Article 22.
[39] CCAD (2010) *Regional Strategy on Climate Change*. El Salvador: CCAD.
[40] Ibid. Action area 1.6.1.
[41] Ibid. Action area 1.6.1.5.
[42] Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC, hereafter). 2164 UNTS 31. Entered into force on 2 May 2001.
[43] Ibid. Recital 7.

marine areas, their protection and conservation require cooperation and coordination among States.[44] Costa Rica, Guatemala, Honduras and Mexico are Parties to this Convention, and Nicaragua is a signatory country.[45] The main objective of this Convention is to promote the protection, conservation and recovery of sea turtle populations and of the habitats on which they depend.[46] Its geographical scope encompasses the land territory of the Parties, as well as waters under their sovereignty and jurisdiction.[47] The Convention includes a provision calling for appropriate measures for the conservation and recovery of sea turtle populations and their habitats, including with respect to vessels on the high seas that are authorized to fly a State Party's flag.[48] In this regard, the Convention is thus applicable to the high seas areas of the CRD. Importantly, conservation measures within the Convention are comprehensive and include prohibition of intentional capture, killing, and domestic trade of sea turtles, their eggs, parts or products;[49] compliance with CITES obligations;[50] the conservation and restoration of sea turtle habitats and nesting areas, as well as the designation of protected areas;[51] the promotion of scientific research;[52] and reduction of the incidental capture or mortality of sea turtles in fishing activities through the regulation of appropriate gears, devices or techniques, including the use of turtle excluder devices (TEDs).[53] In relation to international cooperation and capacity building, the Convention calls for collaboration and assistance on training, the exchange of scientific information and transfer of environmentally sustainable technologies, as well as collaboration on the improvement of fishing gear and techniques.[54]

The importance of the instrument should not be underestimated because as seen in chapter 2, diverse turtle species benefit from the Dome's habitat such as the leatherbacks and the green sea turtles. Annex II of this Convention details different measures to protect sea turtle habitats within a State Party's territory and in marine

[44] Ibid. Recital 10.
[45] IAC (2017) *Party countries*. Available at: http://www.iacseaturtle.org/paises-eng.htm
[46] IAC. Article 2.
[47] Ibid. Article 3.
[48] Ibid. Article 4(1.b).
[49] Ibid. Article 4(2.a).
[50] Ibid. Article 4(2.b).
[51] Ibid. Article 4(2.d).
[52] Ibid. Article 4(2.e).
[53] Ibid. Article 4(2.h).
[54] Ibid. Article 12(2,3,4).

areas where it exercises sovereignty, sovereign rights or jurisdiction.[55] These include the establishment of protected areas and supplementary measures to regulate activities in areas where sea turtles nest or regularly occur, including closures, modification of fishing gears, and restrictions on vessel traffic.[56] All of these measures are applicable to the CRD.

Finally, in relation to ABNJ and the negotiation process of a new legally binding instrument for the conservation and sustainable use of marine biodiversity in such areas, during the 8th Conference of the Parties in 2017, Member States of this Convention approved by consensus a declaration supporting the progress of the BBNJ process in the United Nations. Moreover, it recognizes the need to better address conservation actions in ABNJ,[57] recalling that sea turtles spend an important part of their life on the open seas,[58] and urging all the Parties to take into account the objectives and experiences of this Convention.[59]

5.2.4 Institutional support for conservation: The Central American Commission on Environment and Development

The regional governance regime for environmental matters in general is complex and fragmented. The Central American Commission on Environment and Development[60] (CCAD, hereafter) is responsible for the regional environmental agenda within the SICA framework. This body was created in 1989,[61] and it is mandated to contribute to the sustainable development in the Central American region, as well as strengthening cooperation and integration arrangements for the optimal and rational use of natural resources, control of pollution and the restoration of the ecological balance in the Central American region.[62]

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[55] Ibid. Annex II.
[56] Ibid. Annex II (1,3).
[57] IAC. Promotion of the conservation of sea turtles and its relation to the United Nations General Assembly Resolution 69/292. COP8-2017-Doc.3. CoP 8th Argentina 28-30 June, 2017. Para. 3.
[58] Ibid. Para. 5.
[59] Ibid. Para. 8.
[60] SICA, above n 6. The CCAD member States are Costa Rica, El Salvador, Guatemala, Nicaragua and Honduras. Subsequently Belize, Panama and the Dominican Republic incorporated as full members, and Mexico as an observer.
[61] Convention establishing the Central American Commission on Environment and Development. Signed on 12 of December 1989.
[62] Ibid. Article 1.

Among the guiding objectives of the CCAD, two of them directly link to the hypothesis tabled in chapter 1, as well as the CRD Agreement proposals advanced in chapter 9. The first one relates to the identification of priority working areas, including shared ecosystems.[63] The second one seeks for the promotion of coordinated actions between Government agencies and non-governmental or international organisations, for the rational utilization of natural resources.[64] As will be seen in chapters 6 and 7, the identification of key ecosystems to be protected, trans-boundary conservation actions and the duty to cooperate and coordinate, are some of the pillars within regional frameworks pertaining to the marine environment. Moreover, both objectives are of primary importance to the proposed CRD initiative, specifically addressing regional collaboration for the protection and sustainable use of biodiversity in the Dome.

The institutional structures are relatively streamlined with the Commission.[65] The Commission is composed of a Chair, the Secretariat and Ad-hoc technical committees established to carry out specific functions[66] which are detailed under the CCAD Convention.[67] One of its functions is the formulation of strategies to promote sustainable development including the implementation of the 2030 Agenda of Sustainable Development.[68] In this regard, CCAD launched the Regional Environmental Strategy 2015-2020,[69] which has a number of provisions that are significant for the CRD initiative. This Strategy recognizes that biodiversity is critical for economies, given the goods and services it provides.[70] Additionally, and relevant to the CRD initiative, it includes a strategic thematic area on forests, oceans and biodiversity, acknowledging the benefits from terrestrial, marine and coastal ecosystems and their natural resources.[71]

[63] Ibid. Article 2(g).
[64] Ibid. Article 2(c).
[65] Ibid. Article 4.
[66] In the operational context, CCAD has technical committees which work on protected areas, forests, climate change, biodiversity conservation and environmental legislation, among other matters.
[67] Ibid. Articles 5-9.
[68] Ibid. Article 7(a),(b).
[69] CCAD, above n 16.
[70] Ibid. 11.
[71] Ibid. 14.

Moreover, the Strategy incorporates action lines on conservation; participatory and sustainable management of marine resources; recovery of vulnerable species and ecosystems; contribution to marine spatial planning processes; and strengthening of protected areas and connectivity through marine biological corridors, among others.[72] All of these tasks are pertinent to the hypothesis outlined in chapter 1 that a regional approach forms the course of action in the protection of the CRD. Finally, capacity building, research and technology transfer are crosscutting issues included in the strategy,[73] which should be taken into consideration in future conservation actions to protect biodiversity in the Dome.

5.2.5 Pursing regional conservation goals: The North-East Pacific Regional Seas Programme

Regional Seas Programmes developed within the United Nations Environment Programme (UNEP, hereafter) focus on assisting countries in the protection of coastal and marine environments. A key element of the Regional Seas vision is the engagement of neighbouring countries in comprehensive actions to protect shared marine environments and resources.[74]

Specifically related to the CRD, it is located within the geographical scope of the Regional Seas Programme of the North-East Pacific, which aims for the development and consolidation of an integral management of the shared marine area between the Central American countries.[75]

As it will be seen in further chapters, each Regional Seas Programme has a Plan of Action as its management tool, which is based on a region's particular environmental concerns, challenges, socio-economic and political situation.[76] In addition, the Plans of Action are underpinned by a robust legal framework to address key issues and challenges, in the form of a regional Convention and Protocols.[77] Generally speaking, these instruments are tailored according to views and needs of Governments and

[72] Ibid. 14.
[73] Ibid. 10.
[74] UNEP (2017) *Regional Seas Programme. North East Pacific Action Plan*. Available at: http://drustage.unep.org/regionalseas/north-east-pacific#
[75] Ibid.
[76] Ibid.
[77] Ibid.

institutions within the region and are supplemented by programs of implementation measures, strategies and compliance mechanisms, addressing environmental assessment, legislation and management, as well as institutional and financial arrangements.[78] As it will be explored in chapters 6 and 7, some Regional Seas Programmes have truly advanced in conservation measures and coordination among various countries in specific regions.

Specifically, regarding the CRD area, the Regional Seas Programme of the North-East Pacific has its legal backbone in the form of the Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North-East Pacific, also known as the Antigua Convention (UNEP Antigua Convention, hereafter).[79] However, it must be pointed out that the UNEP Antigua Convention has only been ratified so far by Guatemala and Panama.[80] Crucially, a total of four Central American countries will need to ratify this legal instrument before it enters into force. Nevertheless, in the context of the research question posed above regarding the potential of existing regional instruments and institutions acting as a legal plinth for the development of the *lex specialis* regulatory regime for the CRD, the following key points can be made about this instrument under the chapeaux: objectives, principles, institutions, plan of action, entry into force and compliance.

First, the Convention's main objective is to establish a regional cooperation framework to encourage and facilitate the sustainable development of marine and coastal resources of the countries of the Northeast Pacific[81] where its geographical scope extends to the maritime areas, in conformity with UNCLOS provisions.[82] Parties to this Convention are called to adopt measures to prevent, reduce and control pollution of the marine and coastal environment, and ensure sustainable environmental management of such areas and their resources.[83] In achieving this mandate, Parties are

[78] UNEP (2017) *Regional Seas Action Plans*. Available at: http://www.unep.org/regionalseas/who-we-are/regional-seas-action-plans
[79] UNEP. Antigua Convention. Adopted on the 18th February 2002.
[80] ECOLEX. Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North-East Pacific. Available at: https://www.ecolex.org/details/treaty/convention-for-cooperation-in-the-protection-and-sustainable-development-of-the-marine-and-coastal-environment-of-the-northeast-pacific-tre-001350/
[81] UNEP Antigua Convention. Article 1.
[82] Ibid. Article 2(1).
[83] Ibid. Article 5(1).

called to adopt legislative and administrative measures,[84] and collaborate at a regional level in the implementation of provisions for the protection of the marine environment.[85] Additionally, and of relevance to the CRD Agreement provisions on trans-boundary issues highlighted in chapter 9, Contracting Parties are required to adopt measures so that activities under their jurisdiction or control do not cause environmental deterioration to other Parties or in ABNJ.[86]

Secondly, other environmental measures within the UNEP Antigua Convention include the implementation of international environmental principles, such as the precautionary principle,[87] the polluter pays principle,[88] the duty to cooperate on environmental impact procedures,[89] as well as the exchange of data and information,[90] and the involvement of civil society in decision-making processes.[91] All of these pertinent principles and approaches are explored in the new Agreement for the CRD.[92] In addition, the Convention addresses measures to prevent, control and remedy pollution and deterioration of the marine environment,[93] cooperation in emergency cases,[94] monitoring of pollution and environmental deterioration,[95] implementation of integrated management of the marine environment,[96] exchange of information,[97] liability and compensation[98] among others.

Thirdly, in relation to institutional arrangements, the Convention includes references to a meeting of Contracting Parties and an Executive Secretariat.[99] However, in practice, under the Regional Seas Programmes the implementation of the Plan of Action usually initiates before the specific Convention enters into force, and thereafter, the Executive

[84] Ibid. Article 5(3).
[85] Ibid. Article 5(4).
[86] Ibid. Article 5(5).
[87] Ibid. Article 5(6.a).
[88] Ibid. Article 5(6.b).
[89] Ibid. Article 5(6.c).
[90] Ibid. Article 5(6.g).
[91] Ibid. Article 5(6.e).
[92] Chapter 9.
[93] UNEP Antigua Convention. Article 6.
[94] Ibid. Article 8.
[95] Ibid. Article 9.
[96] Ibid. Article 10.
[97] Ibid. Article 11.
[98] Ibid. Article 13.
[99] Ibid. Article 15.

Secretariat of the Plan of Action becomes the Secretariat of the Convention.[100] In the specific case of the UNEP Antigua Convention and the Plan of Action of the North-East Pacific, UNEP was designated as the interim Secretariat until a formal designation of the Executive Secretariat was agreed.[101] Since those complex discussions in 2002, the Secretariat hasn't been consolidated, mainly due to financial constraints.[102] As such, the institutions are very much stillborn and have not realized any of their potential.

Fourthly, the Plan of Action for the Protection and Sustainable Development of the Marine and Coastal Areas of the North-East Pacific[103] provides for a regional cooperative framework to facilitate the sustainable management of the marine resources in the North-East Pacific.[104] Additionally, the Plan of Action has different components, such as: environmental assessment,[105] environmental management,[106] a legal component, which includes considerations of environmental impact assessment, protected areas and the sustainable use of marine biodiversity from the depths,[107] the latter relevant to the current discussions taking place in the BBNJ negotiation process at the United Nations.[108]

In regards to institutional arrangements, the Plan of Action calls for the establishment of a variety of bodies, namely: a General Authority,[109] a technical advisory body,[110] regional coordination units,[111] and national coordinating centres.[112] Additionally, the role and involvement of civil society[113] and international organisations[114] on preserving

[100] Ibid. Article 14. See also: UNEP. *First Intergovernmental meeting of the Plan of Action of the Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North-East Pacific. Guatemala, 19-22 February 2002*. Available at: http://drustage.unep.org/regionalseas/sites/unep.org.regionalseas/files/documents/nep_IGM1_EN.pdf. Para. 45.
[101] Ibid. Para. 53.
[102] Ibid. VIII. Financial arrangements.
[103] UNEP. Plan of Action for the North-East Pacific Regional Seas Programme. Available at: http://wedocs.unep.org/bitstream/handle/20.500.11822/11137/nep_action_plan_en.pdf?sequence=1&isAllowed=y
[104] Ibid. Para. 14.
[105] Ibid. Para. 17-23.
[106] Ibid. Para. 24.
[107] Ibid. Para. 25-28.
[108] See Chapter 8.
[109] Ibid. Para. 30-33.
[110] Ibid. Para. 34-35.
[111] Ibid. Para. 36-40.
[112] Ibid. Para. 41-42.
[113] Ibid. Para. 47.
[114] Ibid. Para. 48.

the marine and coastal environment is also recognized in the Plan of Action. Much of the detail is contained in two Annexes. The first Annex contains a proposal of a work programme,[115] including activities on strengthening regional capacity,[116] the creation of a regional legal framework for the protection of the marine environment,[117] monitoring and control of marine pollution,[118] management of the marine environment,[119] among other matters. The second Annex develops a Regional strategy for the implementation of the programme of activities of the Plan of Action.[120]

Fifthly, as pointed out previously, even though the UNEP Antigua Convention, the Plan of Action and its Annexes have been developed some years ago, currently the Convention has not entered into force, thus making it making it unfeasible to implement the Plan of Action. In addition, the scope of the actions contained in such instruments are mostly focused on the prevention of marine pollution, in a similar approach to the rest of UNEP's Regional Seas Programmes. However, as it will be seen in chapters 6 and 7 of this study, in other regions of the world, these Programmes have evolved from a narrow framework on prevention of pollution to a broader ecosystem approach to the protection of biodiversity and the resources it supports. Furthermore, in the broader context of the arguments advanced in this thesis it is important to keep in mind that considerations to reactivate the North-East Pacific Regional Seas Programme have been currently on the political agenda in the Central American Region for some time. If this new political initiative concretizes during the upcoming years, it would be of great benefit to the CRD initiative, given the political and technical robust structure that could be provided by a Regional Seas Programme.[121]

In other words, the answer is affirmative to the research question posed at the start of the chapter, which is that the UNEP Antigua Convention and the institutions thereunder could act as a legal plinth for the future development of a *lex specialis* regional marine biodiversity regime, such as the one advanced in chapter 9.

[115] Ibid. Annex I.
[116] Ibid. Annex I. 1.
[117] Ibid. Annex I. 2.
[118] Ibid. Annex I. 8.
[119] Ibid. Annex I. 17.
[120] Ibid. Annex II.
[121] Chapters 6 and 7 of this thesis.

In appraising regional measures it is pertinent to recall that Professor Nilufer Oral has pointed out that the UNEP Regional Seas Programme reveals an uneven landscape of structures and institutions.[122] This appears to be very much the case in relation to the UNEP Antigua Convention from the discussion above. Furthermore, because it is not in force, this instrument fails singularly as a mechanism for the delivery of multilateral obligations, including those pertaining to the conservation and sustainable use of biodiversity. Of further concern is that UNEP's medium-term global strategy has not resulted in the development of a comprehensive governance framework for the North Pacific.[123] In view of the fact that the "regional approach remains an important modality in ensuring the transfer of international obligations to national level,"[124] there is an obvious gap in the Eastern Pacific Ocean that can be filled by the scheme outlined in chapter 9. In the latter context, it will be an important consideration that any such instrument is streamlined and dovetailed with the obligations and arise under the UNEP Antigua Convention, including perhaps the harmonising of the two instruments, such as in the manner that was followed in merging the Oslo and Paris Conventions in the North-East Atlantic in the form of the OSPAR Convention.[125]

5.3 REGIONAL FISHERIES REGULATIONS IN CENTRAL AMERICA

The Eastern Central Pacific has had an oscillating pattern in its fish catches since 1980, and produced about 2.1 million tonnes in 2013.[126] As seen in chapter 2, commercial fishing is an important economic activity in the Central American coasts. Overall, this region is extremely productive and supports economically valuable fisheries activities.[127] For example, Mexico, Costa Rica and most countries in Central America are highly dependent on coastal fisheries, especially as a source of jobs and food.[128]

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[122] N. Oral, 'Forty years of the UNEP Regional Seas Programme: from past to future' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing, 2015), 361.
[123] Ibid.
[124] Ibid. 362.
[125] Chapter 6.
[126] FAO. 2016. *The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all.* Rome, 42.
[127] Centre for Ocean Solutions (2009) *Pacific Ocean Synthesis: Scientific Literature Review of Coastal and Ocean Threats, Impacts, and Solutions*. The Woods Center for the Environment, Stanford University. California, 37.
[128] Ibid.

However, while commercial and industrial fishing is an important economic activity, it can lead to overexploitation of resources, marine degradation, and economic decline.[129] Specifically for the Eastern Tropical Pacific, where the CRD occurs, approximately 80 per cent of the fish stocks of commercial interest, except tuna, are fully exploited or overexploited.[130] Moreover, and exacerbating this situation, fisheries management in Central America is generally failing to control illegal fishing, having a direct impact on coastal communities which depend on such fish stocks, and therefore weakening social stability and food security.[131] In addressing such challenges, the Central American countries have developed provisions to regulate fishing activities on a regional basis, which will be analysed below in the context of providing further evidence to answer the research question posed above in the introduction.

5.3.1 Existing regional governance arrangements: The IATTC Antigua Convention

Undoubtedly, the regime for the management and conservation of fisheries is the most developed and well-established regulatory regime in the Eastern Pacific Ocean. On May 31 1949, the Republic of Costa Rica and the United States of America signed the Convention for the Establishment of the Inter-American Tropical Tuna Commission[132] (IATTC, hereafter), which could be considered as one of the antecedents of the current Regional Fisheries Management Organisations (RFMO) regime. In 2003, the Convention for the Strengthening of the Inter-American Tropical Tuna Commission established by the 1949 Convention between the United States of America and the Republic of Costa Rica, also known as the Antigua Convention, was adopted to strengthen and update the IATTC (IATTC Antigua Convention, hereafter).[133] The IATTC Antigua Convention[134] recognizes the importance of fishing highly migratory fish stocks as a source of food, employment and economic benefits.[135] Additionally, and in line with one of the pillars of regional frameworks, this legal instrument reaffirms that

[129] Ibid.
[130] C. Beltran (2005) *East Central Pacific Ocean*. Rome: FAO, 38.
[131] Centre for Ocean Solutions, above n 127, 38.
[132] Convention for the Establishment of the Inter-American Tropical Tuna Commission. 80 UNTS 3. Entered into force on 3 March 1950.
[133] IATTC Antigua Convention. Entered into force on 27 August 2010. Recital 12.
[134] All the Central American countries, except for Honduras, are Parties to the IATTC Antigua Convention. IATTC (2017) Antigua Convention. Available at: https://www.iattc.org/IATTCdocumentationENG.htm
[135] IATTC Antigua Convention. Recital 6.

multilateral cooperation is the most effective means for achieving conservation and sustainable use of living marine resources,[136] which is an important premise underpinning the CRD initiative.

The material scope of the IATTC Antigua Convention covers fishing activities related to tuna and tuna-like species, as well as other species of fish taken by vessels fishing the previously mentioned stocks in the Convention Area.[137] Moreover, the IATTC Antigua Convention seeks to ensure the long-term conservation and sustainable use of such fish stocks,[138] and its geographical scope encompasses ABNJ and jurisdictional waters in the Pacific Ocean bounded by the coastline of North, Central, and South America and by specific coordinates detailed in the Convention.[139]

Provisions on the precautionary approach require IATTC Member States to be cautious when information is uncertain, unreliable or inadequate.[140] Similar to the UN Fish Stocks Agreement, this Convention calls for compatibility of conservation and management measures on high seas and within national jurisdiction of the member States,[141] and also establishes regulations for member States,[142] obligations of flag States[143] and other fishing entities.[144]

As mentioned before, the IATTC Antigua Convention strengthened the previous IATTC legal framework established by the 1949 Convention. For example, it improved and broadened the functions of the Commission, which currently applies the precautionary approach.[145] It requires States to promote and coordinate scientific research;[146] adopt standards for collection and reporting of data;[147] adopt measures to ensure the long-term conservation and sustainable use of the fish stocks, as well as to maintain or

[136] Ibid. Recital 10.
[137] Ibid. Article 1(1).
[138] Ibid. Article 2.
[139] Ibid. Article 3.
[140] Ibid. Article 4. Moreover, when the status of target stocks, associated or dependent species is of concern, Member States must subject such species to enhanced monitoring.
[141] Ibid. Article 5.
[142] Ibid. Article 18.
[143] Ibid. Article 20.
[144] Ibid. Article 21.
[145] Ibid. Article 7(m).
[146] Ibid. Article 7(a).
[147] Ibid. Article 7(b).

restore the populations of harvested species;[148] promote the development and use of selective, environmentally safe and cost-effective fishing gear and techniques,[149] among others. Several of these measures are certainly necessary for the conservation of fish stocks dependent on the CRD habitat. However, enforcement is usually the Achilles heel of these management provisions, as has been experienced with other RFMOs.[150]

In relation to implementing the duty to cooperate, the IATTC has the responsibility to collaborate with regional and global fishery organisations and arrangements, with the view to avoid duplication on working agendas.[151] The IATTC is supported by a Committee for the review of the implementation of measures adopted by the Commission,[152] whose functions are established in Annex III of this legal instrument.[153] Likewise, a Scientific Advisory Committee[154] is another key pillar of the IATTC and its specific functions are detailed in Annex IV of the IATTC Antigua Convention.[155] In regards to the relationship of the Convention with Non-Parties, it requires Contracting Parties to encourage non-member States to adopt laws and regulations consistent with it.[156] A Non-Party State could attain the status of a Cooperating Non-Party, and should fulfil information and compliance requirements within the IATTC framework.[157] Two Annexes to the Convention develop the guidelines and criteria for the establishment of records of vessels,[158] as well as the principles and criteria for the participation of observers at meetings of the Commission.[159]

Furthermore, in achieving its mandate, the IATTC has developed several resolutions to specifically address relevant matters. The following will explore the most significant provisions that could be taken in consideration on a putative management scheme for

[148] Ibid. Article 7(c).
[149] Ibid. Article 7(k).
[150] See critique of RFMOs in Chapter 4, Section 4.1.
[151] Ibid. Article 24. For example, in the case of an overlap in the area of application of the IATTC Antigua Convention with another area under the regulations by another RFMO, the IATTC is required to cooperate and ensure the compatibility of conservation and management measures. Article XXIV.
[152] Ibid. Article 10.
[153] Ibid. Annex 3.
[154] Ibid. Article 11.
[155] Ibid. Annex 4.
[156] Ibid. Article 26.
[157] IATTC Resolution A-04-08, 20 October 2004.
[158] IATTC Antigua Convention. Annex I.
[159] Ibid. Annex II.

the CRD. On IUU fishing, Resolution C-05-07 [160] establishes a process for the publication of a list of vessels presumed to have carried out IUU fishing activities, materializing in the Eastern Tropical Pacific one of the measures established in the FAO Port State Measures Agreement.[161] The process to include a vessel on the IUU fishing list[162] and the measures applicable to these vessels are similar to the ones from the CCAMLR Convention, as will be seen in chapter 7.

Other conservation measure applied by the IATTC for yellowfin, bigeye and skipjack tuna fisheries are temporary closures of specific marine areas for particular purse seine and long-line vessels. For example, Resolution C-13-0 [163] establishes a temporary closure[164] for the yellowfin, bigeye, and skipjack tuna fishing activities by purse-seine vessels and by longline vessels over 24 meters length[165] within a delimited area in the Eastern Tropical Pacific, particularly 96º and 110ºW and between 4°N and 3°S. Even though this temporary closure applied only during specific periods from 2014 to 2016, it must be pointed out that a similar approach could be applied to specific critical areas of biodiversity in the CRD.

In addition, the Commission has also developed conservation measures for different migratory species found in the Eastern Tropical Pacific, which as seen in chapter 2, benefit from the CRD marine environment. The Commission efforts include guidelines to reduce sea turtles by-catch and mortality in fishing operations; [166] mitigation measures to decrease by-catch of seabirds due to long-line vessels operations,[167] as well as the prohibition of retaining on board, trans-shipping, landing, selling of mobula

[160] IATTC Resolution C-15-01, 3 July 2015.
[161] Ibid. Para. 3. In this regard, at each Annual Meeting, the Commission identifies the vessels engaged in activities that undermine the effectiveness of conservation and management measures within the IATTC Antigua Convention area.
[162] Ibid. The main steps of this process include the possibility that Member States or Cooperating non-Members transmit information on new IUU activities to the IATTC Director, who creates a draft IUU list. Afterwards, the Director notifies the Flag State and the vessel owner, who have the chance to present relevant information to the Director. Then a provisional IUU list is developed and finally adopted by the Commission.
[163] IATTC. Resolution C-13-01, 14 June 2013.
[164] Ibid. Para. 12, 20. Temporary closure from 29 September to 29 October during 2014 to 2016. The only exemption to be in the closed area is due to force majeure. Said that, landings and trans-shipments of tuna that have been caught in contravention of this measure are prohibited.
[165] Ibid. Para. 1.
[166] IATTC Resolution C-04-07, 14 June 2004.
[167] IATTC Resolution C-11-02, 8 July 2011.

rays.[168] Likewise, conservation measures for key species of sharks have been developed by the IATTC.[169] The establishment of a ratio of fin-to-body weight of sharks, the prohibition of retaining on board, trans-shipping, [170] landing or trading fins harvested in contravention of the provisions in the IATTC Resolutions, and the reporting of data for catches, effort by gear type, landing and trade of sharks by species, are just some examples.[171] With some additional measures, the protection of some shark populations that occur in the Dome could be improved to ensure their long-term sustainability. In relation to cetaceans, another species that frequently occurs in the CRD, the IATTC has developed the International Dolphin Conservation Programme (AIDCP). This legally binding Agreement aims to reduce incidental dolphin mortalities in the tuna purse-seine fishery, as both species are closely related. All the Central American countries are Parties to this Agreement.[172]

In a similar way to the CCAMLR Convention, which will be addressed in chapter 7, the IATTC has established a vessel monitoring system (VMS) applicable to tuna-fishing vessels with a length of 24 meters operating in the Convention's area. Member States and cooperating non-Members must ensure that the information collected by the VMS includes the vessel's identification, geographical position, date and time.[173] The IATTC also strongly encourages Non-Parties whose flag vessels fish in the Convention's area to participate in the VMS program.[174] This monitoring system could be useful to track fishing activities within the Dome's area and would enable more effective oversight actions to combat IUU fishing. Moreover, the establishment of an on-board observer programme is another important feature of both CCAMLR and the IATTC. The program under the IATTC was created in 1999, with the objective to improve efforts of reducing the incidental mortality of dolphins in the purse-seine tuna fishery.[175]

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[168] IATTC Resolution C-15-04, 3 July 2015.
[169] On oceanic whitetip sharks and silky sharks [see] IATTC Resolution C-16-06, 1st July 2016. On silky sharks and hammerhead sharks see IATTC Resolution C-16-05, 1st July 2016.
[170] IATTC Resolution C-05-03, 24 June 2005.
[171] IATTC Resolution C-16-04, 1st July 2016.
[172] States and Regional Economic Integration Organisations which have ratified or acceded to the Agreement: Belize, Colombia, Costa Rica, Ecuador, El Salvador, European Union, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, United States, Venezuela. IATTC (2017) *Agreement on the International Dolphin Conservation Programme*. Available at: http://www.iattc.org/AIDCPdocumentationENG.htm
[173] IATTC Resolution C-14-02, 18 July 2014.
[174] Ibid. Para. 2.
[175] IATTC Resolution C-11-08, 8 July 2011. Member States and Cooperating non-Member meeting the specific criteria indicated in the Resolution will be required to carry a scientific observer.

On capacity building, a critical element addressed throughout the present study as highlighted in chapter 8, the IATTC created a special fund for strengthening the institutional capacities of developing countries, with the objective to ensure the sustainable development of fisheries for highly migratory species,[176] and for these countries to duly comply with the obligations under the IATTC Antigua Convention.[177] This capacity building component certainly could improve national capacities in the Central American countries to efficiently manage highly migratory fish stocks that move between their EEZ and the high seas areas of the CRD. Finally, within the IATTC framework, a Regional Management Plan[178] on fishing capacity addresses more specific matters such as the assessment and monitoring of fishing capacity, a regional vessel register,[179] capacity limits for purse-seine and long-line fleets; economic incentives; and compliance,[180] among other important matters that could improve the sustainable use of such fish stocks in the region. Clearly the aforementioned measures form a plinth for the development of a specific regime for the protection and conservation of biodiversity.

5.3.2 Improving fisheries management: The Central American Fisheries and Aquaculture Organisation

A great majority of fish stocks in the Central American Region are migratory or highly migratory resources, which possess both opportunities and challenges of conservation and sustainable use and come under the scope of several of the instruments outlined in chapter 4. Furthermore, the growing concern for the status of fish stocks led to the creation of the Central American Fisheries and Aquaculture Organisation (OSPESCA, for its acronym in Spanish).[181] Established by the San Salvador Act,[182] OSPESCA is the responsible body for the definition, implementation and monitoring of strategies,

[176] IATTC Resolution C-14-03, 18 July 2014.
[177] Ibid.
[178] IATTC Plan for regional management of fishing capacity, 24 June 2005.
[179] IATTC Resolution C-00-06, 15 June 2000.
[180] IATTC, above n 163.
[181] Centre for Resource Management and Environmental Studies (2007) *Sub-Regional, Regional and International Stakeholder Assessment Report*. Jamaica: University of the West Indies, 7.
[182] San Salvador Act. Entered into force on 18 December 1995.

policies and projects related to sustainable fisheries and aquaculture in Central America.[183]

The geographical scope of OSPESCA encompasses the jurisdictional waters of its member States,[184] including all of the Central American countries. This could be interpreted as imposing a constraint for the CRD initiative as set out in chapter 9, taking into consideration the interconnection of coastal ecosystems and the high seas, as well as migratory species moving in broad marine areas. Nonetheless, OSPESCA is a key stakeholder in any future putative management scheme for the Dome.

OSPESCA aims to develop and coordinate regional fisheries management and aquaculture activities.[185] In order to enforce a regional model and achieve its objectives, OSPESCA has a variety of functions, such as the promotion of the Integrated Fisheries and Aquaculture Policy; the harmonization and implementation of fisheries and aquaculture legislation, the development of strategies, programmes, and agreements on regional fisheries and aquaculture; among others.[186] Within its institutional structure, the Council of Ministers is the highest authority in OSPESCA, responsible for the political decisions that have a regional dimension.[187] The other two managing figures within OSPESCA are the Committee of Deputy Ministers, being the executive level that directs and evaluates the implementation of policies, programmes and regional projects;[188] and the Committee of Directors of Fisheries and Aquaculture, which represents the scientific and technical level.[189]

Furthermore, OSPESCA works through the guidelines established in the Integration Policy for Fisheries and Aquaculture 2015-2025,[190] which recognizes the similarities of the marine biodiversity in the different Member States of SICA, making feasible a

[183] Ibid. Para. a.
[184] OSPESCA Member States are: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Dominican Republic. Observer States to OSPESCA are the following: China, Spain, and Mexico. FAO (2017) *Regional Fishery Bodies Summary Descriptions*. Available at: http://www.fao.org/fishery/rfb/ospesca/en
[185] Ibid.
[186] Centre for Resource Management and Environmental Studies, above n 181, 7.
[187] San Salvador Act. Para. b.
[188] Ibid. Para. c.
[189] Centre for Resource Management and Environmental Studies, above n 181, 7.
[190] OSPESCA, Resolution No. 10, 1st July 2015. Integration Policy for Fisheries and Aquaculture 2015-2025.

collaborative management with coordinated and integrated efforts.[191] Notably, the decisions taken by the Councils of Ministers within the SICA framework are legally binding to Member States.[192] In this regard, the provisions included in the Fisheries Policy, which could benefit the conservation of the biodiversity in the CRD, are compulsory for the Central American countries, but only applicable within jurisdictional waters, and in the high seas for vessels flying the flag of the SICA member States.[193]

On the implementation of previous fisheries policies, OSPESCA has identified a variety of challenges, involving the need for capacity building and training programmes: progress on management and sustainable use of biodiversity and fisheries; strengthening regional governance models; advances on mitigation and adaptation measures to address climate change, among others.[194] From this group of challenges, the strengthening of regional models and the progress needed on biodiversity conservation specifically relates to the CRD initiative.

Some specific objectives included in the current Fisheries Policy could enhance the CRD initiative, such as the strengthening of regional and international coordination;[195] the strengthening of institutional capabilities; [196] involvement of organized stakeholders;[197] and the promotion of a regional program for fisheries research.[198] Additionally, a set of guiding principles from the Fisheries Policy could inform a putative Agreement for the CRD, such as the precautionary principle, the preventive approach, sustainability, regional responsibility and integration, cooperation, participation of civil society and solidarity.[199] Moreover, the Policy is based on the premise that healthy marine ecosystems are more productive and represent the only way to ensure sustainable economies,[200] and therefore it takes into account the

[191] Ibid. 13.
[192] Tegucigalpa Protocol. Article 22.
[193] Ibid. 18.
[194] Integration Policy for Fisheries and Aquaculture, 14.
[195] Ibid. Specific objective (g).
[196] Ibid. Specific objective (a).
[197] Ibid. Specific objective (f).
[198] Ibid. Specific objective (c).
[199] Ibid. 17.
[200] Ibid. 19.

ecosystem approach on the management and sustainable use of biodiversity with best practices for fisheries and aquaculture.[201]

Within the strategic lines of this Fisheries Policy, and specifically on regional governance,[202] OSPESCA and Member States are called to consolidate governance models based on binding Agreements,[203] whose initiatives could come from the Governmental authorities or civil society.[204] This particular matter is of remarkable importance for the CRD initiative, where a putative management scheme suggested by relevant stakeholders, including civil society, could be incorporated in the OSPESCA regional framework.

Additionally, the Policy develops a strategic action line on regional management of fisheries,[205] and includes some relevant tasks to be considered in a new CRD Agreement, such as: the implementation of a regional research plan;[206] decision-making processes informed by the best available science and good practices;[207] the reinforcement of management schemes for highly migratory and straddling fish stocks based on principles of regional governance;[208] and improvement on measures to prevent, deter and eliminate IUU fishing,[209] among other matters. Moreover, within the relationship of OSPESCA and other international frameworks, like CITES and other similar Conventions, the Fisheries Policy seeks to promote protocols to standardize scientific and administrative requirements,[210] as well as the standardization of regional regulations to prevent the trade of fish products caught using prohibited fishing gears, captured in closed areas or in smaller than approved sizes.[211] As seen in chapter 3, different species which benefit from the CRD are listed in the CITES Annexes, and could find additional support within the Fisheries Policy.

In regards to control and surveillance, the Fisheries Policy calls for a collective effort

[201] Ibid.
[202] Ibid. 22.
[203] Ibid. Specific objective (b).
[204] Ibid. Strategic action line VI.2.1.
[205] Ibid. Strategic action line VI.3.
[206] Ibid. Strategic action line VI.3.1.
[207] Ibid. Strategic action line VI.3.2.
[208] Ibid. Strategic action line VI.3.10.
[209] Ibid. Strategic action line VI.3.18.
[210] Ibid. Strategic action line VI.7.6.
[211] Ibid. Strategic action line. VI.7.9.

within the Central American region, as well as international cooperation for transparency in the use of fisheries resources.[212] In achieving such objectives, OSPESCA seeks for the use of new control and surveillance technologies to combat IUU fishing[213] and the gradual implementation of a Regional Satellite System to monitor and control fishing vessels.[214] Certainly these actions, joined with the monitoring and enforcement measures endorsed by the IATTC, would improve marine conservation within the CRD area.

On international coordination,[215] the Policy aims to strengthen and consolidate OSPESCA working agendas with RFMOs and Cooperation Agencies.[216] The strengthening of coordination with regional and international organisations to take action on the vulnerability of aquatic species and ecosystems due to climate change, ocean acidification, and extreme weather events[217] all of the latter impacts elements come within the scope of the Fisheries Policy.[218] Finally, and similar to what has been done in other regional frameworks such as the ones that are examined in chapters 6 and 7 of this study, coordination actions are taken with other regional structures. For example, a Memorandum of Understanding (MoU, hereafter) between CCAD[219] and OSPESCA aims to strengthen coordination in environmental issues related to fisheries in the Central American region. Another MoU between OSPESCA and the IATTC addresses the exchange of scientific information, technical assistance and training.[220] In the specific case of the CRD, these three regional organisations have formal Agreements to formulate and coordinate working agendas in regards to the conservation and management of marine biodiversity that benefits from the CRD ecosystem.

[212] Ibid. Strategic action line VI.6.8.
[213] Ibid. Strategic action line VI.6.9.
[214] Ibid. Strategic action line VI.3.9.
[215] Ibid. Strategic action line. VI.9.
[216] Ibid. Strategic action line. VI.9.2.
[217] Ibid. Strategic action line VI.4.1, VI.4.2.
[218] Ibid. Strategic action line VI.4.
[219] Memorandum of Understanding between CCAD and OSPESCA. Available at: http://www.sica.int/busqueda/Centro%20de%20Documentaci%C3%B3n.aspx?IDItem=74729&IdCat=25&IdEnt=47&Idm=1&IdmStyle=1
[220] Memorandum of Understanding between IATTC and OSPESCA. Available at: http://www.sica.int/busqueda/Centro%20de%20Documentaci%C3%B3n.aspx?IDItem=79671&IdCat=25&IdEnt=47&Idm=1&IdmStyle=1

The Fisheries Policy lends itself as a whole to adoption of regional specific biodiversity measures such as those set out in chapter 9 for the CRD. In this context there is a duty for States and international organisations under treaty and customary law to coordinate their actions in relation to fisheries. Furthermore, measures to coordinate action on the management of shared stocks accords with the spirit if not the letter of UNCLOS including Article 63(1) in particular. Importantly, in supporting the hypothesis set out in chapter 1, the fisheries policy can promote sustainable fishing practices by preventing IUU fishing in the EPO through expanding the port state control system, along with fishing vessels and monitoring activities.

5.4 REGIONAL SHIPPING PROVISIONS IN CENTRAL AMERICA

5.4.1 Maritime transportation governance: The Central American Commission for Maritime Transportation

As mentioned in chapter 4, approximately 90 per cent of the world trade is transported by sea. Specifically, in the Central American Region, the increase of shipping activities is unequivocal. For example, in 2013 the Central American Region mobilized 134.7 million metric tons by sea, having increased 135 per cent in comparison with the volume transported in 2001.[221] With this in mind, the SICA regional framework has a specialized body for maritime navigation, namely the Central American Commission for Maritime Transportation (COCATRAM, for its acronym in Spanish).

COCATRAM is the technical and advisory entity to attend the development of maritime transportation in Central America and it was established by Resolution 5-80 in 1980.[222] Later, through Resolution V-3-87,[223] the Meeting of Ministers of Transportation of Central America (REMITRAN) appointed COCATRAM as its technical advisory body, and afterwards its Statutes were updated by a Special Agreement.[224] With a view to achieve a harmonious and effective development of the maritime sector in Central America, COCATRAM was created for the adoption and implementation of policies,

[221] COCATRAM (2014) *Central American Regional Maritime and Port Strategy*. Nicaragua: COCATRAM, 2.
[222] Meeting of Ministers responsible for the Central American economic integration. Resolution 5-80. Entered into force on 15 July 1980.
[223] Entered into force on 27 February 1987.
[224] Special Agreement of the Ministers responsible for maritime transportation in Central America. COCATRAM Statutes. Entered into force 11 July 1991.

measures and recommendations in the different fields of maritime transportation, at regional and national levels.[225] All the Central American countries are Member States of COCATRAM.[226]

Again for fostering regional solutions it is interesting to note that within its institutional structure, COCATRAM has three main bodies to apply its competences: the Board of Directors, as the highest decision making body, the Vigilance Commission and the Executive Secretariat.[227] Vitally, among its specific objectives, this Commission is called to promote policies on the protection of marine and terrestrial environments and support its implementation in Central America.[228] In addition, other functions carried out by COCATRAM include the adoption of a Regional Maritime Policy,[229] support training policies on maritime and port fields,[230] and the strengthening of maritime Authorities and Port entities at local levels,[231] among others.

From a governance perspective, there has been considerable progress in the achievement of COCATRAM core functions, including the conclusion of different MoUs with the IMO regarding cooperation for the effective implementation of global maritime standards. Moreover, as COCATRAM is the regional focal point to address maritime matters, it will be the most appropriate institutional actor to coordinate measures for the possible designation of a PSSA in the CRD area, with a view to protecting vulnerable and sensitive marine ecosystems. We will return to this designation again in chapter 9. However, the countries that could submit the proposal must take into consideration their ability to fulfil the PSSA criteria and the required complementary data, as seen in chapter 4, such as the tailored measures to address shipping, the completion of consultation processes with affected States and stakeholders, and to ensure the domestic implementation of the submitted measures.[232] The mandate of COCATRAM clearly supports the view that strong regional institutions

[225] COCATRAM Statutes. Article 5.
[226] Ibid. Article 12.
[227] Ibid. Article 21.
[228] Ibid. Article 18 (e).
[229] COCATRAM, above n 221, Para. 3.1
[230] Ibid. Article 18 (f).
[231] D. Attard, M. Fitzmaurice, N. Martinez, R. Hamza (eds.), *The IMLI Manual on International Maritime Law: Marine Environmental Law and International Maritime Security Law* (United Kingdom: Oxford University Press, 2016), 226.
[232] International Hydrographic Organisation (2017) *Considering Alternatives for Managing Ship Traffic*. Available at: http://www.iho-machc.org/documents/ecctg1_doc.html#A, 28, 29.

and regulatory arrangements are fundamental to the formulation and implementation of a specialist legal regime for the CRD.

5.4.2 The Central American Regional Maritime and Port Strategy

COCATRAM works under the Central American Regional Maritime and Port Strategy,[233] with the objective to improve conditions in the countries of the region and for the isthmus to be in competitive advantage, given its strategic position close to the Panama Canal.[234] The Strategy addresses institutional and legal actions to contribute to the development and strengthening of the maritime administrations in Central American countries, as well as the Maritime Port Sector, with the view to ensure maritime safety and the protection of the marine environment.[235] A relevant specific objective from the Strategy seeks to increase growth opportunities within a new integrated approach to environmental protection.[236] In the latter context it is also pertinent to bear in mind that among the six strategic areas of action[237] included in this Policy, four main action lines include the protection of marine ecosystems, and could be applied and used as support for further conservation actions within the CRD specialist framework.

Specifically in regards to maritime transportation, the Strategy pursues the prevention, reduction and control of water degradation,[238] as well as development of the necessary actions for the ratification and implementation of international Conventions related to maritime safety, protection of the marine environment and labour law.[239] In relation to maritime Administrations, the Strategy calls for the consolidation of the national authorities in each of the Central American countries[240] to effectively protect the marine environment[241] and to support actions that promote the establishment of regional cooperation Agreements to combat marine pollution.[242] Moreover, the need to integrate the protection of the marine environment into relevant general policies on

[233] COMITRAN. Resolution 01-2014. Entered into force on 11 November 2014.
[234] COCATRAM, above n 221, 3.
[235] Ibid.
[236] Ibid. Strategic Objective IV.3.
[237] Ibid. 12. The six areas of action within the Strategy are: shipping, ports, regional maritime policy, maritime administration, education and training and marine and coastal areas.
[238] Ibid. Specific Objective V.b.1.i.
[239] Ibid. Specific Objective V.b.1.b.
[240] Ibid. General Objective VIII.a.1.
[241] Ibid. General Objective VIII.a.2.
[242] Ibid. General Objective VIII.a.2.a.

environmental, social and national economic development,[243] as well the need to promote Agreements implementing Port State measures in the region,[244] are included in the regional maritime policy action lines. The Strategy also strives for the conservation and sustainable use of coastal and marine areas, and its natural resources.[245] Some of the identified actions in this specific matter which could enhance the CRD initiative are the following: coordination with national sectors involved in the protection of the marine environment; [246] facilitate international cooperation to support marine conservation efforts;[247] provide technical advice and cooperation on the protection of the marine environment from shipping pollution;[248] strengthen Port facilities capacity for the adequate reception of oily and hazardous waste;[249] and prevention of the spread of exotic organisms in ballast waters;[250] among other actions.

5.5 APPRAISAL OF REGIONAL LEGAL FRAMEWORK AND INSTITUTIONS

The answer is affirmative to the research question posed at the start of this chapter concerning the need for a region-specific approach to protect and conserve the unique biodiversity of the CRD in ABNJ. Moreover, the findings above can be summarized in five key points that are germane to hypothesis set out in chapter 1.

Firstly, the majority of instruments reviewed above are limited in geographical and material scope. They thus need to be supplemented by a region-specific instrument on the conservation and sustainable use of biodiversity in ABNJ. Crucially, in this regard, it ought to be noted that the Central American Integration System (SICA) provides a political framework to address common interests and concerns in the region with three regional bodies: CCAD, OSPESCA and COCATRAM. All three have nascent work programmes in relation to marine conservation and the sustainable use of offshore resources. Accordingly, there are institutional structures in place for the management of the marine environment, fisheries and shipping on a transnational basis in areas within

[243] Ibid. Specific Objective VII.b.1.j.
[244] Ibid. Specific Objective VII.b.1.l.
[245] Ibid. General Objective X.a.1.
[246] Ibid. General Objective X.a.1.a. For example: Ministries of Environment, universities, shipping companies, terminal operators, ship-owners, fishing industry.
[247] Ibid. General Objective X.a.1.b.
[248] Ibid. General Objective X.a.1.d.
[249] Ibid. General Objective X.a.1.g.
[250] Ibid. General Objective X.a.1.h.

national jurisdiction, which is crucial for the sustainable management of anthropogenic impacts on the CRD.

The second point is that the legal framework for environmental management is fairly well developed from a terrestrial perspective. In particular, the Central American Commission on Environment and Development (CCAD) establishes environmental and cross-sectoral regional agendas. There is, however, an urgent need to negotiate and adopt a regional Agreement with a specific focus on marine environmental protection in areas beyond national jurisdiction, as well as to ensure the application of an ecosystem-based approach, which will certainly benefit the protection of biodiversity in the CRD. The reactivation of the Secretariat under UNEP for the North East Pacific Regional Seas Program would definitely strengthen marine conservation actions in the region. This suggestion will be addressed later on in this study in chapter 9.

Thirdly, in relation to maritime transportation and spatial planning of the marine environment for specific purposes through the use of ABMTs, the Central American Commission for Maritime Transport (COCATRAM) is the regional focal point to address maritime matters and is therefore the most appropriate institutional body to coordinate and discuss possible designations of specific parts of the CRD within national jurisdiction as an IMO designated PSSA. However, countries that are eligible to submit such a proposal must have the ability to: fulfil the PSSA criteria, complete the stakeholder consultation processes and ensure domestic implementation of the management measures.

Fourthly, the Central American Fisheries and Aquaculture Organisation (OSPESCA) is the responsible body for the establishment and implementation of regional fisheries strategies and policies. In this regard, the Integration Policy for Fisheries and Aquaculture 2015-2025 guides fisheries management. In addition, the IATTC is the competent RFMO for the Eastern Tropical Pacific. It has adopted measures pertaining to an IUU fishing vessel list, vessel monitoring systems and an on-board observer programs. In general, there is a relatively well-developed and functioning institutional structure for the management of straddling and highly migratory fish stocks in line with the scheme set down by the UN Fish Stocks Agreement.

Finally, there is a pressing need for greater coordination of effective conservation measures. A notable feature of the arrangements described in this chapter is the absence of effective compliance mechanisms that engender the discharge of legal obligations. This is compounded by the lack of political commitment for ratifying and implementing international commitments, most notably the UNEP Antigua Convention. Accordingly, as a minimum, all three regional organisations, CCAD, OSPESCA and IATTC, should further advance their formal working arrangements to ensure the conservation and management of all marine resources including biodiversity associated with the CRD. In the latter context, it will be an important consideration that the CRD Agreement outlined in chapter 9 is streamlined and dovetailed with the obligations and arises under the UNEP Antigua Convention. Notably, as pointed by Professor Oral, different standards and principles apply in different regional seas instruments and this holds true for the EPO.[251] Nonetheless, regional institutions and arrangements can form a solid foundation and complement the development of a new regional scheme for the CRD. In this context, good "governance, especially within a framework of regional co-operation is a dynamic function of law, policy, science and international relations."[252]

5.6 CONCLUSIONS

The chapter has undertaken a review of regional institutions and instruments. The picture that emerges is reflective of a range of political, economic and environmental considerations. As seen, much of the impetus for the development of regional structures came about in response to political instability in the 1980s, the so-called lost decade. The structures and instruments have contributed to economic development and the alleviation of poverty, as well as the move towards sustainable growth. A central aim of the Tegucigalpa Protocol is the protection of the environment through the establishment of a new regional ecological order.[253] Regional cooperation is key to competiveness and as seen in the synthesis above, SICA has a crucial role to play as it is legally entitled to conclude treaties or legally binding agreements with third States or organisations.[254] CCAD, OSPESCA and COCATRAM could thus further advance marine conservation measures in general by ensuring effective implementation of policies and

[251] N. Oral, *Regional cooperation and protection of the marine environment under international law: The Black Sea* (The Netherlands: Koninklijke Brill NV, 2013), 285.
[252] Ibid. 286.
[253] Tegucigalpa Protocol. Article 3.
[254] Ibid. Article 31.

strategies, and through the enhancement of regional coordination mechanisms. Nevertheless, as argued above, the sectoral approach of these bodies needs to be superseded by a regional body capable of reinforcing effective collaboration among the different sectors benefiting from the CRD.

From the perspective of this thesis, there are positive and negative aspects to regional environmental integration. On the positive side, the UNEP Antigua Convention is the governing instrument for the North-East Pacific Regional Seas Programme. However, on the negative side there has been slow ratification and implementation of existing treaties and obligations. One can infer that a feasible option could be the expansion of this Convention to include new provisions for the conservation of the biodiversity in the ABNJ of the CRD. However, a lack of political will and commitment has surrounded this specific Convention since its creation in 2002, and this intrinsic weakness represents a highly risky baseline for the establishment of a CRD instrument within the UNEP Antigua Convention framework. Additional elements shortcomings in this Convention include the disparate aspects of its material scope, geographical scope and governance schemes, which will be further addressed in chapter 9. The influence of UNEP in developing a regional seas scheme has thus been inherently weak.

Accordingly, it is easy to conclude that an integrated regional approach needs to be adopted in respect to the conservation of the unique biodiversity associated with the CRD. There is also a clear need for the engagement of neighbouring countries in comprehensive actions to protect the shared marine ecosystem of the CRD and its associated biodiversity. A robust legally binding instrument and institutional structure are pre-requisites for success, as well as a compliance mechanism, dispute settlements provisions, active involvement of stakeholders and public participation and funding mechanisms and partnerships are elements to be considered in a new instrument for the CRD.

Finally, it ought to be noted that regional measures on climate change and on fisheries management need to be enhanced and accord fully with the central thrust of SRFC advisory opinion,[255] pursuant to which ITLOS clarified several matters including the

[255] *Definition of the minimum access conditions and exploitation of fisheries resources within the maritime zones under the jurisdiction of Sub-Regional Fisheries Commission (SRFC) Member States,* ITLOS Case No. 21 (Advisory Opinion) 2015.

international obligations of States and regional bodies under UNCLOS and related instruments, issues of liability, along with the nature and extent of the obligation to cooperate on the conservation and management of shared fisheries resources.

CHAPTER 6. *SUI GENERIS* REGIONAL APPROACHES TO BIODIVERSITY IN ABNJ UNDER THE OSPAR AND THE BARCELONA CONVENTIONS

6.1 INTRODUCTION

Since the conclusion of third United Nations Conference on the Law of the Sea with the adoption UNCLOS in 1982, ocean governance arrangements at global and regional levels have evolved in a relatively haphazard fashion, very often over the past two decades with the overall aim of improving the protection of the marine environment and the sustainable use of its resources.[1] In parallel, however, the progressive development of technology and the undertaking of new ocean related activities continue to pose new ocean governance challenges, particularly in the context of the exploration and exploitation of offshore resources.[2] Many of these challenges were not foreseen by the negotiators of UNCLOS such as the need to have a specific legal regime for the conservation and sustainable use of biodiversity.[3]

In this context, regional approaches to ocean governance allow for the application of new normative schemes to environmental protection including the implementation of the ecosystem approach, as well as appropriate representation of ecological, economic, societal and political interests of stakeholders in decision-making structures and procedures.[4] At the same time, regional arrangements and "regional State practice are increasingly informed by greater political and public awareness of the strategic importance of the ocean and adjacent seas for the economic prosperity and sustainable development of maritime regions."[5] Furthermore, actions at the regional level have led

[1] G. Wright, J. Rochette, E. Druel, 'Marine protected areas in areas beyond national jurisdiction' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 277.
[2] S. Kayes, S. (2016) 'Technology and Maritime Enforcement: Is International Law Ready for the Future?,' *Legal Order in the World's Oceans: UN Convention on the Law of the Sea. 40th Annual Conference of the Center for Oceans Law and Policy*. United Nations Headquarters, New York. June 27.
[3] See Chapters 3 and 8.
[4] S. Unger (2016) 'Partnership for Regional Ocean Governance and its support for the regional seas programmes in relation to ABNJ. Regional Seas Programmes and Biodiversity in ABNJ.' *Side event at the Second Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, 6 September.
[5] R. Long, 'North-East Atlantic and the North Sea' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015), 648.

to the advancement of scientific knowledge, regulatory practice and the elaboration of management tools in ABNJ,[6] which currently appear to be the only way forward in achieving global conservation objectives[7] such as those agreed by the World Summit on Sustainable Development.[8]

However, as it will be seen later in this thesis, the development of a negotiation process for a new legally binding instrument on the conservation and sustainable use of biodiversity in ABNJ[9] (the BBNJ Agreement, hereafter) represents a major step going forward towards the improvement of ocean governance.[10] Surely in this regard, one of the principal challenges remains on how to enhance cooperation and coordination amongst the competent authorities that are responsible for various sector activities at multilateral, regional and national levels.[11] With this in mind, chapter 6 presents two regional case studies on the protection of the marine environment and the conservation of biodiversity in ABNJ. Specifically, the OSPAR and the Barcelona Convention case studies focusing on the establishment of marine protected areas (hereafter, MPAs) in ABNJ. These cases are selected because they are clearly germane to the future establishment of a regional scheme for the CRD.

The discussion in this chapter is aimed at addressing two main elements. At first, a brief legal overview is presented on each regional case study, mainly focusing on how regional arrangements advance the protection of biodiversity. The second element explores the progression of these regional examples in relation to the elements which are under negotiation for inclusion in the BBNJ Agreement as part of a package deal, namely: areas based management tools including marine protected areas, environmental impacts assessment, marine genetic resources, capacity building and transfer of marine technology, as well as additional cross-cutting issues including

[6] J. Rochette et al., (2014) 'The Regional Approach to the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction,' *Marine Policy* Vol. 49, 116.
[7] Ibid.
[8] UN Doc. A/CONF.199/20, 4 September 2002.
[9] The issues addressed in the BBNJ negotiation process are canvassed in a special section 'Advancing Governance of Areas beyond National Jurisdiction,' *Marine Policy,* Vol. 49, 81–194.
[10] J. Rochette, G.Wright, K. Gjerde, T. Greiber, S. Unger, A. Spadone (2015) *A new chapter for the high seas? Historic decision to negotiate an international legally-binding instrument on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction*. Paris: IDDRI (Issue Brief 2/15).
[11] B.C. O'Leary, et. al., (2012) 'The first network of marine protected areas in the high seas: The process, the challenges and where next,' *Marine Policy*, Vol. 36, 598–605.

guiding principles, specifically the precautionary principle and the ecosystem approach, dispute settlement and liability, coordination and cooperation in the form of regional arrangements with sectoral bodies, as well as governance arrangements. Furthermore, the chapter strives to answer three specific research questions: first, how each particular regional agreement advances the conservation and sustainable use of biodiversity in ABNJ; second, how does the regional agreement address the particular elements under discussion in the BBNJ negotiation process; third, what lessons can be learned and applied in the context of designing new arrangements for the Costa Rica Dome.

6.2 OSPAR: A PIONEER APPROACH TO MARINE ENVIRONMENTAL PROTECTION

At first sight, the OSPAR experience appears to be clearly worth replicating elsewhere in the world, as it sets an example for other States on how best to adopt and implement a regulatory framework at a regional level for the conservation of biodiversity through the adoption of legally binding decisions, recommendations and agreements, backed by relative robust schemes applied and enforced by Contracting Parties. [12] At the outset, it should be noted that regional arrangements have a very solid normative basis in the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention, hereafter), [13] which is an international agreement that requires 15 European States, together with the European Union, to cooperate in the protection of the marine environment of the North-East Atlantic.[14] As an international treaty, it is a sophisticated and stable framework that can trace it roots back to 1972, when the first

[12] Wright, Rochette, Druel, above n 1, 256. See also: E. Molenaar, A. Oude Elferink (2009) 'Marine Protected Areas in areas beyond national jurisdiction: The pioneering efforts under the OSPAR Convention,' *Utrecht Law Review*, Vol. 5(1), 5–20.

[13] Convention for the Protection of the Marine Environment of the North-East Atlantic. UNTS 2354 UNTS 67. Entered into force 25 March 1998. The 16 Contracting Parties to OSPAR are: Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the European Union. For commentaries on the OSPAR Convention, see, *inter alia*: E. Hey, T. Ijlstra, A. Nollkaemper, (1993) 'The 1992 Paris Convention for the protection of the marine environment of the North-East Atlantic: A critical analysis,' *International Journal of Marine and Coastal Law*, Vol. 8(1); D. Freestone, D. Johnson, J. Ardron, K. Morrison, S. Unger (2014) 'Can existing institutions protect biodiversity in areas beyond national jurisdiction? Experiences from two on-going processes,' *Marine Policy*, Vol. 49, 167-175; D. Johnson (2008) 'Environmental indicators: Their utility in meeting the OSPAR Convention's regulatory needs,' *ICES Journal of Marine Science*, Vol. 65, 1387–1391; D. Johnson, et. al., (2014) 'When is a marine protected area network ecologically coherent? A case study from the North-east Atlantic,' *Aquatic Conservation: Mar. Fresh W. Ecosyst*, Vol. 24, 44-58.

[14] OSPAR Convention. Recital 3.

conservation goals were set down under the Oslo Convention against dumping, which was extended to cover land-based sources and offshore industry by the Paris Convention in 1974. These two Conventions were unified and reformed by a single agreement in the form of the OSPAR Convention in 1992.[15] The latter has a clear focus on marine environmental protection in general and the conservation biodiversity more specifically, in so far as it requires Contracting Parties to "take all possible steps to prevent and eliminate pollution"[16] and where practicable to "take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems."[17] In addition, it requires Contracting Parties to restore marine areas, which have been adversely affected by such activities.[18] For this purpose, they must adopt programmes and measures, as well as harmonise their national policies and strategies.[19]

Importantly, adding to the aforementioned general obligations that are placed on Contracting Parties, Annex V on the protection and conservation of the ecosystems and biological diversity in the OSPAR maritime area covers non-polluting human activities that can adversely affect the sea.[20] In regards to the extent and nature of other human activities and their impacts on marine ecosystems, article 5 of Annex V details four criteria for identifying human activities.[21] They are extremely broad ranging in scope and extend to the following: 1) the extent, intensity and duration of the human activity under consideration; 2) actual and potential adverse effects of the human activity on specific species, communities, and habitats; 3) actual and potential adverse effects of the human activity on specific ecological processes; 4) irreversibility or durability of these effects. Clearly, these criteria could be applied under other regional arrangements if adopted by the relevant Contracting Parties to the regional seas treaties. In addition, they could guide decision makers in any future scheme pursuant to the CRD initiative with a view to regulating the different activities taking place in the Dome, or that may soon develop in the Eastern Pacific Ocean.

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[15] Ibid. Recital 13.
[16] Ibid. Article 2.1(a)
[17] K. Scott, 'Integrated Oceans Management: A new frontier in marine environmental protection,' in Rothwell, Oude Elferink, Scott, Stephens, above n 5, 476; and Long, above n 5, 661.
[18] OSPAR Convention. Article 2.1 (a)
[19] Ibid. Article 2.1 (b).
[20] Ibid. Annex V.
[21] Ibid. Annex V. Appendix 3.

Similarly relevant to the present analysis, the geographical scope[22] of the OSPAR Convention encompass marine areas beyond the national jurisdiction of the Contracting Parties, specifically in the Wider Atlantic and the Arctic Waters, which cover approximately 40% of the OSPAR maritime area in total.[23] As is evident from the Quality Status Report[24] there are 'many hot spots of biodiversity associated with deep-water corals, reefs, fragile marine ecosystems, hydrothermal vents, submarine canyons and seamounts',[25]as well as, vulnerable species such as the European sturgeon, the Atlantic salmon, the common skate and the white skate, the angel shark, the Balearic shearwater, the blue whale, the loggerhead turtle and the orange roughy fish,[26] all of which are just some examples of the biodiversity present in OSPAR's geographical area.

A remarkable element of the OSPAR Convention is the codification of a robust framework of principles that guide the conduct of Contracting Parties. More specifically, under this treaty, Contracting Parties must apply the precautionary principle, the ecosystem approach, the polluter pays principle, the best available techniques and environmental practice in decision making and in their management programmes.[27] Crucially, the ecosystem approach has been endorsed in several decisions under the OSPAR framework, including the 2010-2020 North East Atlantic Strategy,[28] where it has been described as an overarching principle in OSPAR´s work.[29] A similar matrix of principles and approaches, complemented by additional ones such as the principle inter-generational equity, common but differentiated responsibility, cooperation, stewardship and protection of the marine environment,[30] could also be

[22] Ibid. Article 1 (a).
[23] OSPAR Commission (2014) *Status Report on the OSPAR Network of Marine Protected Areas*. London, 18.
[24] OSPAR Commission (2010) *Quality Status Report 2010*. London.
[25] Long, above n 5, 650.
[26] OSPAR Commission, above n 24, chapter 10.
[27] OSPAR Convention. Article 2.2. Also: J. Corley, (2016) 'OSPAR and the collective arrangement,'
Side event at the Second Session of the BBNJ Preparatory Committee. United Nations Headquarters, New York, 6 September. See also: R. Long, *Marine Resource Law* (Dublin: Thomas Round Hall, 2007), 601.
[28] OSPAR Commission (2010) *Strategy of the OSPAR Commission for the protection of the marine environment of the North-East Atlantic 2010-2020*. Available at: http://www.ospar.org/site/assets/files/1413/10-03e_nea_environment_strategy.pdf
[29] OSPAR Commission, above n 28, preamble 2.
[30] High Seas Alliance (2016) *Ten Governance Principles for an International Legally Binding Instrument on Marine Biodiversity in Areas Beyond National Jurisdiction*. Available at:

adopted by Contracting Parties to a putative Agreement for the conservation of biodiversity in the CRD. Indeed, these principles reflect the normative standards advanced by the Rio Declaration, Agenda 21, the Johannesburg Plan of Implementation, along with the 2030 Agenda for Sustainable Development.

In addition to the Annex on biodiversity mentioned above,[31] the OSPAR Convention is supplemented by four other Annexes, considered as an integral part of the treaty,[32] dealing with critical elements that also ensure biodiversity conservation both directly and indirectly, such as prevention and elimination of pollution from land-based sources,[33] prevention and elimination of pollution by dumping or incineration,[34] prevention and elimination of pollution from offshore sources,[35] assessment of the quality of the marine environment.[36] Here one may detect that from this list of Annexes, Annex IV and V could be replicated in the CRD initiative in so far as they address the conduct of scientific assessment and monitoring programmes, along with the pressing challenges pertaining to the conservation of biodiversity.

The institutional structures supporting the work of OSPAR Contracting Parties is also relevant to the design of future governance arrangements for the CRD. In particular, the Convention provides a legal basis for the establishment of a Commission, which is made up of representatives of each of the Contracting Parties.[37] They are required to meet at regular intervals and at any time to respond to special circumstances.[38] On an operational basis, the OSPAR Commission executes the decisions taken by the Contracting Parties, and works towards the harmonisation of policies, programs and measures for the protection of the marine environment.[39] Additionally and in line with international best practice, OSPAR is serviced by a Secretariat,[40] five main

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http://highseasalliance.org/sites/highseasalliance.org/files/HSA_10%20principles_English_web.pdf

[31] OSPAR Convention. Annex V.
[32] Ibid. Article 14.
[33] Ibid. Annex I.
[34] Ibid. Annex II.
[35] OSPAR Convention. Annex II.
[36] Ibid. Annex IV.
[37] Ibid. Article 10.1
[38] Ibid. Article 10.1
[39] Ibid. Article 10.
[40] Ibid. Article 12.

Committees[41] and working groups.[42] Furthermore, observers[43] are allowed to participate in the Commission's meetings[44] and a broad range of programmes and measures in the form of six thematic strategies have been put in place by Contracting Parties.[45] The six thematic strategies are broad in ambit and extend to the following: biodiversity and ecosystems, eutrophication, hazardous substances, offshore industry, radioactive substances, and the joint assessment and monitoring of the marine environment.[46] Also, the OSPAR Commission is equipped with an advance mechanism for supervision combined with a reporting system.[47] In this regard it is important to bear in mind that the "efficacy of the OSPAR regime is absolutely dependent upon Contracting Parties implementing regional obligations by means of national and EU law, including the harmonization of national environmental policies and strategies."[48] Accordingly, the role of Contracting Parties and their willingness to cooperate and coordinate on marine environmental matters remains at the very heart of the OSPAR governance arrangements.

Finally, attention must be drawn to the regionalisation provision included in the Convention, [49] pursuant to which the Commission may decide that an adopted recommendation will apply to all the geographical area of the Convention, or just to specific marine area. This may be a useful approach to implement in the CRD initiative, considering the existing differences and capabilities among the Central American countries, where there may well be significant constraints on resources by States within the region to adopt and effectively enforce conservation measures that apply to the protection and conservation of biodiversity both within and beyond national jurisdiction.

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[41] The five main Committees are the following: Hazardous substances and Eutrophication Committee, Offshore industry Committee, Radioactive substances Committee, Biodiversity Committee and Environmental Impact of Human Activities Committee. OSPAR Commission (2017). OSPAR *Organisation*. Available at: http://www.ospar.org/organisation
[42] OSPAR Commission. Agreement 2013-02-Rules of Procedure, rules 27-35.
[43] OSPAR Commission, above n 42, Annex 2.
[44] OSPAR Convention. Article 11.
[45] Long, above n 5, 660.
[46] OSPAR Commission, above n 28, part II.
[47] Reporting systems provide the foundation for international supervision. Y. Tanaka (2009) 'Reflections on reporting systems in Treaties concerning the protection of the marine environment,' *Ocean Development and International Law*, Vol. 40, 146.
[48] Long, above n 5, 661.
[49] OSPAR Convention. Article 24.

In summary, the OSPAR Convention "sets a global example in the establishment of collaborative maritime governance structures to protect and preserve the marine environment."[50] With appropriate political support, a similar framework could be replicated in the form of a regional treaty applicable to the CRD initiative, taking in consideration the specificities of the Central American Region. A notable progressive feature in the OSPAR approach to regional environmental protection is the inclusion of observers in discussions, such as civil society organisations and international agencies.[51] A corresponding inclusive approach would be of great value in any future governance scheme for the CRD in so far as it would legitimize regional arrangements, enhance coordination and implementation of policies of international bodies as they apply to the CRD, as well as build up accountability and transparency in the Central American Region. This approach would also be cost effective in the sense that few of the coastal States have resources to monitor effectively the implementation of regional arrangements and should not bear a disproportionate burden in this regard under any new arrangements.

Turning next to the research questions outlined above and their applicability to specific aspects of the OSPAR framework including most particularly its approach to spatial management measures in the form of MPAs, as well as the conservation of threatened species and fragile ecosystems.

6.2.1 Protection of marine biodiversity under the OSPAR framework

As a starting point, and as seen in chapter 3, the establishment of protected areas is an in-situ conservation tool under the CBD,[52] and in light of this provision OSPAR has developed a network of marine protected areas, including MPAs in ABNJ. Furthermore, the Sintra Ministerial Statement[53] established that the OSPAR Commission also had the political commitment to promote the creation of a network[54] of marine protected areas to ensure the sustainable use, protection and conservation of marine biological

[50] Long, above n 5, 660.
[51] Some OSPAR observers are IOC, IMO, ICES, ISA, NEAFC, NRDC, WWF, among others. For further information on the intergovernmental and non-governmental observers list see: http://www.ospar.org/organisation/observers
[52] CBD. Article 8 (a).
[53] Adopted at the meeting of the OSPAR Commission at Sintra, Portugal, 22-23 July 1998.
[54] OSPAR Commission (2014) *Status Report on the OSPAR Network of Marine Protected Areas*. London: OSPAR, 7.

diversity and its ecosystems.[55] Action in this regard is very extensive. By the end of 2016, for instance, the network of marine protected areas within OSPAR comprises 423 sites,[56] from which 413 MPAs are under national waters of Contracting Parties and 10 MPAs located beyond national jurisdiction, with different jurisdictional and management regimes.[57] Jointly, these protected areas cover approximately 789 125 km² or 5,8% of the OSPAR maritime area in the North-East Atlantic.[58] Significantly, the majority of OSPAR marine protected areas are situated in the territorial seas of Contracting Parties,[59] and there also appears to be a major geographical imbalance regarding the distribution of the MPAs throughout the different OSPAR sub-regions.[60] On the other hand, in the Central American Region all MPAs have been created under jurisdictional waters of States and closer to the coast, so OSPAR offers a good model for the establishment of MPAs in ABNJ or in high seas areas over the extended continental shelf of coastal States.[61]

Specifically on the protection of marine ecosystems and biodiversity in ABNJ, OSPAR has assumed a pioneering role as a regional organisation in designating areas for the protection of fragile marine ecosystems.[62] In 2010, six proposals for the establishment of MPAs on the high seas were adopted: the Charlie-Gibbs South MPA, the Milne Seamount Complex MPA, the Mid-Atlantic Ridge north of the Azores High Seas MPA, the Altair Seamount High Seas MPA, the Antialtair High Seas MPA and the Josephine Seamount Complex High Seas MPA.[63] However, the particularities of the geographical scope of these areas must be noted because of their controversial nature in so far as several of them may ultimately come within the scope of coastal State continental shelf

[55] Ibid.
[56] Ibid. 1.
[57] OSPAR Commission (2015) *Status Report on the OSPAR network of marine protected areas*. London: OSPAR, 1.
[58] Ibid.
[59] Approximately 16.4% in territorial waters and 2.01% in EEZ. OSPAR Commission, above n 58, 1.
[60] OSPAR Commission, above n 54, 14, 16.
[61] The following percentages per country correspond to marine protected areas established under jurisdictional zones: Guatemala 0.79% in 6 MPAs; El Salvador 0.67% in 3 MPAs; Honduras 0.95% in 17 MPAs; Nicaragua 4.27% in 11 MPAs; and Costa Rica 9.58% in 67 MPAs.
Marine Conservation Institute (2016) *MPAtlas*. Available at: www.mpatlas.org
[62] OSPAR Commission, above n 54, 18.
[63] Ibid.

jurisdiction. For example, five[64] MPAs are located in areas within a Portuguese submission to the Commission on the Limits of the Continental Shelf (CLCS, hereafter) for the establishment of the outer limits of its extended continental shelf under article 76 UNCLOS.[65] Likewise, in 2011 the United Kingdom nominated the North West Rockall SAC marine protected area, which encompasses areas beyond its EEZ and comes within the scope of a submission to the CLCS.[66] The Charlie-Gibbs North High Seas MPA was established in 2012[67] and is partly situated within an area subject to a submission by Iceland to the CLCS.[68] Finally, the Hatton Bank SAC MPA and Hatton-Rockall Basin MPA are in areas of the outer continental shelf that are claimed by both the UK and Iceland and subject to CCLCS submissions by both States.[69]

In summary, of the ten MPAs established by OSPAR in ABNJ, only two, the Charlie-Gibbs South MPA and the Milne Seamount Complex MPA, are situated entirely beyond the jurisdiction of Contracting Parties.[70] The other eight MPAs remain under submissions to the CLCS and depending on its recommendations, could fall under the jurisdiction of Portugal, Iceland or the United Kingdom. Crucially, within the CRD initiative, Costa Rica may have an extended continental shelf in a part of the Pacific Ocean adjacent to the CRD,[71] and the issues to be addressed and resolved by Portugal, the United Kingdom or Iceland within the OSPAR framework are directly relevant to the future designation of MPAs in or adjacent to the CRD.

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[64] The five MPAs located in areas within the Portuguese submission are the Mid-Atlantic Ridge north of the Azores High Seas MPA, the Altair Seamount High Seas MPA, the Antialtair High Seas MPA, the Josephine Seamount Complex High Seas MPA, and the Rainbow Hydrothermal Vent Field. Ibid. 21.

[65] Ibid. 18.

[66] Important to bear in mind is that both seabed and subsoil of the site are protected by the United Kingdom, while the water column above remains unprotected. Ibid. 19.

[67] OSPAR Commission Meeting, 25-29 June 2012, Germany. Ibid. 18

[68] In this MPA the water column is protected collectively by OSPAR, and the seabed and the subsoil are unprotected. Ibid. 21.

[69] The seabed and subsoil of these sites are protected by the United Kingdom, while the water column remains unprotected. Ibid.

[70] Ibid. 20.

[71] See Preliminary information indicative of the outer limits of the continental shelf beyond 200 nautical miles submitted by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/cri2009informacion_preliminar.pdf

More generally, there are a number of points that can be made in regards to the OSPAR approach on the designation of MPAs in ABNJ. Instructively, and in line with the OSPAR Convention provisions, the identification of a site to be proposed as an MPA should meet ecological criteria including threatened or declining species and habitats, important species and habitats, ecological significance, high natural biological diversity, and sensitivity.[72] Additionally, practical aspects such as size, potential for success of management measures, scientific value, among others should be taken in consideration.[73] On the decision making process, a concrete proposal to establish a protected area needs to be considered in detail by all Contracting Parties[74] and the designation of an MPA on ABNJ requires their collective agreement.[75]

Regarding the management of OSPAR MPAs, Contracting Parties are required to develop a management plan and determine appropriate measures following OSPAR guidelines.[76] In this regard, there is a bifurcated approach to management measures, in so far as where the Contracting Party is competent to adopt a measure, it should initiate the processes under its domestic legislation. Where the competence lies with another authority or international organisation, however, the State should seek the adoption of those measures by the international organisation.[77] Additionally, the OSPAR Commission has adopted some recommendations,[78] as well as accountability measures to guide OSPAR Contracting Parties regarding the management of MPAs.[79]

As mentioned above, Annex V of the OSPAR Convention provides the legal basis for the establishment of a network of marine protected areas within the OSPAR framework, which aims to protect, conserve and restore species, habitats and ecological

[72] OSPAR Commission. Recommendation 2003/17. Guidelines for the Identification and selection of MPAs in the OSPAR Maritime Area, Appendix I.
[73] Ibid. Appendix II.
[74] OSPAR Commission, above 54, 51.
[75] OSPAR Convention. Article 13.
[76] OSPAR Commission. Agreement 2003/18. Guidelines for the management of MPAs in the OSPAR maritime area, Appendix I, 54.
[77] OSPAR Commission. Recommendation 2003/3 amended by Recommendation 2010/2, para. 3.2.
[78] OSPAR Commission, above n 72.
[79] OSPAR Commission, above n 76, Appendix I. See also H. von Nordheim, T. Packeiser (2011) ' Designation and management of OSPAR MPAs beyond national jurisdiction in the North-East Atlantic,' *IUCN Seminar on the conservation and sustainable use of marine biodiversity beyond national jurisdiction*. Bonn, Germany, 3–6 December. See also: D. Vousden, 'Large marine ecosystems and associated new approaches to regional, transboundary and high seas management,' in Rayfuse, above n 1, 395; and Wright, Rochette, Druel, above n 1, 282.

processes.[80] However, the network as a whole was not been considered by OSPAR to be ecologically coherent at the time of writing.[81] Specific shortcomings in the OSPAR framework include the absence of adequate spatial coverage to protect species and habitats.[82] On the other hand, there are positive aspects of the conservation regime, as it requires a good representation of the different biogeographic regions within the North-East Atlantic, which is one of the conditions for ecological coherence. [83] Furthermore this is complemented by another biodiversity conservation action required under the OSPAR Convention, which is the identification and protection of threatened species. In this regard, the Commission has developed the List of Threatened and/or Declining Species and Habitats.[84] At the time of writing, fifty two recommendations have been adopted by the OSPAR Commission for this purpose.[85]

There is one other aspect of OSPAR Convention area that ought to be mentioned, which is the dynamic nature of marine biodiversity in light of the effects of climate change. In addressing the effects of climate change in general and ocean acidification more specifically, as stressors that act synergistically to change primary production patterns and modify species distribution.[86] The OSPAR Commission has reported that all of it Regions have experienced range shifts and changes in fish distribution and abundance as a result of the impacts of climate change. [87] Consequently, the Commission established a Strategy for the protection of the marine environment of the North-East Atlantic, with specific objectives to address ocean acidification and to ensure integrated management of human activities.[88] At a practical level, the Strategy sets out the framework for action, including regional and coordinated development of

[80] OSPAR Commission, above n 77, para. 2.1.
[81] Ibid, recital 6. On the status of the OSPAR network see OSPAR Commission, above n 57. See also: E. Olsen et. al., *Achieving ecologically coherent MPA networks in Europe: Science needs and priorities* (Ostend: European Marine Board, 2013).
[82] European Environment Agency, *Marine protected areas in Europe's seas: An overview and perspectives for the future* (Luxembourg: EEA, 2015), 5.
[83] OSPAR Commission, above n 54, 41.
[84] OSPAR Commission. Agreement 2008/6. List of threatened and/or declining species and habitats. Particular examples of these species and habitats are the following: the bowhead whale, blue whale, harbour porpoise, the sturgeon, European eel, the Basking shark, Spotted ray, long-snouted seahorse, bluefin tuna, Azorean limpet, ivory gull, and habitats such as Oceanic ridges with hydrothermal vents, coral gardens, deep-sea sponge aggregations, seamounts, sea-pen & burrowing megafauna communities, among others.
[85] OSPAR Commission (2015) *Annual Report 2014/2015*. London: OSPAR, 4.
[86] A. D. Rogers, D. A. Laffoley (2011) *International Earth system expert Workshop on ocean stresses and impacts. Summary Report*. Oxford: IPSO.
[87] OSPAR Commission, above n 24, chapter on Climate Change.
[88] OSPAR Commission, above n 28, 4.

monitoring and assessment of marine biodiversity and ecosystem functioning.[89] kLikewise, the OSPAR Commission is working with partner organisations[90] to enhance the knowledge on these issues.[91] The approach of OSPAR addressing range shifts in biodiversity due to the effects of climate change, may well be worth replicating in the CRD, which as seen in chapter 2 is transient or ephemeral during its annual cycle.[92]

6.2.2 OSPAR guiding elements for the development of regional arrangements for the CRD and the BBNJ Agreement

As it will be further analysed in detail in chapter 8, the elaboration of a new legally binding instrument for the conservation and sustainable use of marine biodiversity, currently under negotiation at the United Nations (the BBNJ negotiation process), represents a historic opportunity to significantly change and improve ocean governance globally, and in many ocean regions including the CRD. That said, the oceans are facing challenges that go well beyond the capacity of regional environmental arrangements to resolve.[93] The continuation of the status quo is therefore not an option and one can conclude that the outcome of the BBNJ negotiation process will be critical to the future protection of marine ecosystems and the restoration of the environmental health of the ocean to a favourable conservation status. As such, both regional and multilateral regimes are needed,[94] and the new BBNJ Agreement with a range of governance approaches will enhance existing regional arrangements such as those that apply in the OSPAR maritime area, as well as closing policy and legal lacunae in the CRD.[95]

Accordingly, it is a useful exercise to review very briefly below the OSPAR arrangements and the positions taken by OSPAR Contracting Parties to see how they interrelate with the discussion underway at the United Nations. The four elements

[89] Ibid. 8.
[90] For example the International Council for Exploration of the Sea (ICES), the Intergovernmental Oceanographic Commission (IOC) and the Arctic Council. Ibid. 3.
[91] Ibid.
[92] P. C. Fiedler (2002) 'The annual cycle and biological effects of the Costa Rica Dome,' *Deep Sea Research I*, Vol. 49, 321-338.
[93] Wright, Rochette, Druel, above n 1, 285. See also: J. Rochette et al., (2014) 'The Regional Approach to the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction,' *Marine Policy*, Vol. 49, 112.
[94] Wright, Rochette, Druel, above n 1, 288.
[95] Unger, above n 4.

under discussion at the BBNJ negotiation process are as follows: area based management tools (ABMT), including marine protected areas; access to marine genetic resources and benefit sharing; environmental impact assessment; capacity building and technology transfer. Additionally, some cross-cutting elements including legal principles and approaches, dispute settlement and liability are part of the discussions on this negotiation process.

6.2.2.1 Establishment of ABMTs including marine protected areas in ABNJ

As seen above, OSPAR Contracting Parties are global leaders in adopting a cross-sectorial approach and in advancing a paradigm shift in relation to ABMTs including the establishment of MPAs in ABNJ. Some examples of best practice from the OSPAR experience which could be replicated in the development of regional arrangements for the CRD include the adoption of guidelines on identification and selection of sites to be proposed as a MPA, the set of criteria to be accomplished, the establishment of a procedure to designate MPAs, and guidelines on management measures and plans for MPAs. On the other hand, it should also be noted that at the time of writing management plans and measures are in place for just some MPAs in OSPAR, but many still have to be developed and implemented.[96] Furthermore, the achievement of a specific management objective is a matter for the particular competent international body such as the IMO or the ISA. Another weakness is that OSPAR measures are not binding on non-Parties. Significantly, the OSPAR approach to ABMTs has not been replicated in other regional areas outside of the North-East Atlantic. In the context of the CRD, it may well prove to be a useful model in relation to MPAs that straddle areas under coastal State jurisdiction and the high seas, that is to say MPAs on the outer continental shelf should there be any future recommendation from the CLCS in relation to the submission made by Costa Rica. Also, OSPAR's strategy on addressing the effects of climate change and ocean acidification on the marine environment and the biodiversity that it supports need careful analysis and may constitute an example of best international practice.

[96] OSPAR Commission, above n 57, 1.

6.2.2.2 Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA)

Some aspects of the OSPAR EIA/SEA regime ought to be taken into consideration in the design of an impact assessment scheme for the CRD. Conspicuously, the OSPAR Convention requires Contracting Parties to undertake two obligations in relation to EIA.[97] Firstly, to undertake and publish at regular intervals joint assessments of the quality status of the marine environment and development in the maritime area or for regions or sub-regions therein. Secondly, to include in such assessments both an evaluation of the effectiveness of the measures taken and planned for the protection of the marine environment and the identification of priorities for action. Annex IV of the Convention sets out detailed rules on the conduct of EIA including the respective duties of Contracting Parties and the OSPAR Commission. As the majority of OSPAR Contracting Parties are EU member States, OSPAR's approach to EIA and SEA is shaped by the EU's approach as set out in the EIA and SEA Directives.[98] *Prima facie*, the directives contain provisions on EIAs and SEAs that are limited in geographical scope to areas under the sovereignty and jurisdiction of the Member States.[99] However, EU instruments can be applied to activities in ABNJ as long as they come within the general jurisdictional framework set down by the international Law of the Sea including the rules applicable to the flag States.[100]

Again collaboration with other international bodies is at the heart of the OSPAR approach to EIA and SEA.[101] The conduct of EIA is at the core of the risk assessment approach adopted by OSPAR and may trigger the application of the precautionary approach. OSPAR requires EIA to be undertaken pursuant to the Code of Conduct for Responsible Marine Research in the deep seas and high seas of the OSPAR Maritime

[97] OSPAR Convention. Article 6.
[98] Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment, amended in 1997, 2003 and 2009 and codified in Directive 2011/92/EU of the European Parliament and the Council; and Directive 2001/42/EC of the European Parliament and the Council on the assessment of the effects of certain plans and programmes on the environment. E. Druel (2013) *Environmental impact assessments in areas beyond national jurisdiction: identification of gaps and possible ways forward.* Paris: IDDRI. (Studies N°01/13), 20.
[99] Ibid.
[100] Case C-286/90, *Anklagemyndigheden (Public Prosecutor)* v. P.*M. Poulsen and Diva Navigation*, with annotation by P.J. Slot. ECJ 453, para. 9-10. See also: D. Langlet, S. Mahmoudi, *EU environmental Law and Policy* (Oxford: OUP, 2016), 39-40.
[101] OSPAR Commission. Agreement 2008/1. Code of Conduct for Responsible Marine Research in the Deep-Seas and High Seas of the OSPAR Maritime Area, para. 22.

Area,[102] as well as further to the recommendations adopted for the management of the seven OSPAR MPAs in the high seas, where State Parties are called to *"ensure that a human activity in the MPA or any measure potentially conflicting with the conservation objectives of the MPA is subjected to an EIA or a SEA."*[103] Moreover, in relation to threatened and/or declining species and habitats found in the OSPAR list, Parties are required to take into account these relevant species and habitats in undertaking EIAs.[104] Nevertheless, one of the limitations in the OSPAR framework, as in other regional schemes, is the lack of consideration of the cumulative impacts of human activities in the conduct of EIAs.[105]

6.2.2.3 Access to marine genetic resources

There are no specific rules in the OSPAR Convention and relate instruments concerning access to marine genetic resources (MGRs, hereafter) or benefit sharing in ABNJ. One can infer that the approach adopted in the OSPAR maritime area will be very much informed by the approach advocated by the EU, Norway and Iceland at the BBNJ negotiations.

At the first Preparatory Committee (PrepCom, hereafter) meeting at the United Nations,[106] the EU noted that the legal status of MGRs in ABNJ is not a precondition for regulating access with the view to avoid a debate on the legal status of MGRs, and whether they fall under the high seas regime[107] or if they should be considered as common heritage of mankind.[108] Additionally, the EU prefers a pragmatic approach, building on existing efficient regimes such as the International Treaty on Plant Genetic Resources (ITPGR) Multilateral System and the Nagoya Protocol.[109] Secondly, the EU

[102] Ibid. This code of conduct has been adopted in the category "other agreements" and is therefore not legally binding. See Druel, above 98, 2.
[103] The OSPAR Guidelines on best environmental practice (BEP) in cable laying and operation provide for example a list of minimum requirements that an EIA conducted in this context must contain and discuss the monitoring and assessment phase and the access to data. Ibid. 20.
[104] OSPAR Commission. Recommendation 2010/5. Assessments of environmental impacts in relation to threatened and/ or declining species and habitats.
[105] Druel, above n 98, 32.
[106] First Session of the Preparatory Committee. UN Headquarters, New York. 28 March to 8 April 2016.
[107] UNCLOS. Part VII.
[108] Ibid. Part XI.
[109] IISD (2016) 'Summary of the second session of the Preparatory Committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(118), 7.

has an interest for minimal administrative burdens and cost-effective institutions, facilitative access and benefit sharing (ABS, hereafter),[110] as well as marine scientific research conducted in accordance with UNCLOS and biotechnological innovations.[111]

The views of Norway are also significant in so far as it is party to OSPAR but is not a EU Member State. The Norwegian delegation expressed interest on the adoption of a pragmatic approach promoting research and the use of MGRs, distinguishing genetic material from organisms as such,[112] and favoured an ABS regime based on best available scientific information and commercial profit-making, within the limits of sustainability.[113] On the other hand, Iceland has expressed scepticism over suggestions that minerals and living resources be treated similarly.[114]

Furthermore, during PrepCom II[115] discussions on working concepts for MGRs, the EU favoured the definitions contained in the Convention of Biological Diversity and the Nagoya Protocol,[116] and proposed text referencing that benefit sharing should be beneficial to BBNJ conservation and sustainable use.[117] Additionally, the EU noted that no international organisation has the mandate to regulate access to MGRs, emphasizing that access should be conducive to research, and due regard should be given to the interest of all States, the international community and future generations.[118] In a similar position, Norway highlighted the benefits under the Nagoya Protocol and suggested providing a menu of potential benefits under the BBNJ Agreement, as well as including a duty to use environmentally sound bioprospecting operations.[119]

6.2.2.4 Capacity Building and Technology Transfer

[110] Ibid. 8.
[111] Written submission of the EU and its Member States. SN 3757/16, 25 July 2016, 2.
[112] IISD (2016) 'PrepCom 1 highlights: Marine Genetic Resources,' *Earth Negotiations Bulletin*. Vol. 25(99), 2.
[113] IISD (2016) 'Summary of the first session of the Preparatory Committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(106), 7.
[114] IISD, above n 112, 2.
[115] See above n 106.
[116] IISD, above n 109, 3.
[117] IISD, above n 112, 2.
[118] IISD, above n 109, 4.
[119] Ibid.

Along the same line set out in the previous subsection, as the majority of State Parties to OSPAR are members of the EU (with the exceptions of Norway and Iceland), the elements expressed by the EU within the BBNJ negotiation process could be interpreted as the approach that is largely followed by OSPAR Contracting Parties regarding capacity building (CB) and technology transfer (TT). As a start, the EU has pushed for the development of CB & TT tools relevant to developing countries' needs and the effective implementation of Parts XIII and XIV of UNCLOS. Additionally, the EU indicated that scientific training programs and joint scientific research should be expanded and carried out with institutions in developing countries, involving private and public partners. The EU emphasized that tangible capacity building measures are critical for successfully designing and implementing other elements in the BBNJ Agreement.[120] On technology transfer, the EU underscored the importance of the IOC Criteria and Guidelines, and proposed including information on marine science, manuals, guidelines, standards, sampling and laboratory equipment, computer hardware, analytical methods, as well as the recognition of private and public actors and multi- stakeholder partnerships.[121] In PrepCom II, the EU suggested that CB & TT should be undertaken with a view to improving the implementation, compliance and monitoring of obligations arising in the new Agreement; as well as the importance of cooperation on the development of new technologies.[122] The EU preferred capacity building to be demand-driven, ensuring national ownership and gender equality, emphasizing bilateral and multilateral approaches, as well as multi-stakeholder partnerships.[123]Therefore, the inclusion of regional concerns within the CB & TT should be needs-driven, country-owned and responsive to priorities related to the BBNJ Agreement, with flexibility to adapt as needs and priorities change.[124] The discussion on the establishment of a funding mechanism and its modalities of operation was also noted by the EU.[125]

[120] IISD (2016) 'PrepCom 1 highlights: Capacity Building,' *Earth Negotiations Bulletin*. Vol. 25(100), 2.
[121] IISD (2016) 'PrepCom 1 highlights: Technology Transfer,' *Earth Negotiations Bulletin*. Vol. 25(104), 1.
[122] IISD, above n 120, Vol. 25(112), 2.
[123] Ibid.
[124] IISD, above n 120, Vol. 25(116), 1.
[125] IISD, above n 121, Vol.25(116), 2.

In relation to CB and TT, Iceland proposed drawing from the provisions in the UN Fish Stocks Agreement on this topic.[126] Meanwhile, Norway considered that advancing CB & TT for developing countries will be a key means to fulfil obligations under the BBNJ Agreement, including those pertaining to MPAs and EIAs, and highlighted experiences that it had encountered in building developing countries' capacity in the fields of fisheries, oil and gas.[127] Norway underscored the importance of promoting joint programmes and giving developing countries a more active role in CB and TT, rather than being mere recipients of development aid.[128]

Finally, in relation to capacity building in regional practice within UNEP's Regional Seas Programme, OSPAR has worked together with the Abidjan Convention.[129] Cooperation between both frameworks by sharing knowledge and experiences on the implementation of the ecosystem approach has been a relevant tool.[130] More specifically, OSPAR, IMO and the Abidjan Convention held a joint workshop in 2011 for countries Parties to the latter, mainly to support capacity building for ecosystem-based management in the Abidjan Convention area. The IMO and OSPAR provided information and experience in strengthening regional cooperation, best practice and lessons learned on different topics, such as marine pollution management, the procedures in the London Protocol, management of offshore oil and gas activities and the establishment and management of MPAs. A second meeting was held in 2015, where OSPAR provided advice through experts from its Offshore Industry Committee and the Secretariat. Additionally, with the view to build partnerships, strengthen cooperation and given that both Secretariats have an interest in the protection and conservation of the marine environment,[131] a Memorandum of Understanding was agreed between OSPAR and the Abidjan Convention.[132] The MoU addresses close cooperation on matters of mutual interest, exchange of information and expertise, participation in meetings as observers and the promotion of joint regional meetings,

[126] IISD, above n 120, Vol. 25(100), 2.
[127] Ibid.
[128] IISD, above n 120, Vol. 25(112), 2.
[129] Abidjan Convention for cooperation in the protection and development of the marine and coastal environment of the West and Central African Region. 1316 UNTS 205. Entered into force 5 August 1984.
[130] OSPAR Commission (2017) *International Cooperation*. Available at: http://www.ospar.org/about/international-cooperation/abidjan-convention. Relevant to bear in mind is that the geographical scope of both Conventions covers almost all of the marine area in the Eastern Atlantic.
[131] MoU between OSPAR Secretariat and Abidjan Secretariat. Recital 3.
[132] Ibid.

workshops and capacity building activities.[133]

6.2.2.5 Cooperation and coordination with international bodies

One major feature of the OSPAR regime is that it recognises that multiple activities and uses are taking place in the OSPAR maritime area, which go beyond the competence of OSPAR to regulate or manage for the purpose of protecting the marine environment or ensuring the sustainable use of biodiversity. For this reason, the OSPAR Commission has adopted a collaborative approach that entails cooperation and coordination with other competent international authorities,[134] mainly through the conclusion of Memoranda of Understanding (MuO) Agreements and by participating in both formal and informal consultative meetings.[135]

A notable example of best practice is the cooperative procedures that have been agreed with international bodies that have specific competence for the management of fisheries and marine living resources, namely: the North East Atlantic Fisheries Commission,[136] the International Commission for the Conservation of Atlantic Tunas, the North Atlantic Salmon Conservation Organisation,[137] the North Atlantic Marine Mammal Commission, and the International Whaling Commission.[138] The origins of these arrangements can be traced to Annex V of the OSPAR Convention, which states that no programme or measure concerning fisheries can be adopted under the Convention,[139] but keeps open the possibility for the Commission to cooperate with the competent bodies for this purpose. A good example of how this works in practice is the MoU concluded between OSPAR and NEAFC,[140] which provides that both regional

[133] Ibid. Para. 2.
[134] OSPAR Commission, above n 54, 18.
[135] For example in March 2010 in Madeira/Portugal and January 2012 in Paris/France. OSPAR Commission, above n 54, 18.
[136] Memorandum of Understanding between the North East Atlantic Fisheries Commission (NEAFC) and the OSPAR Commission. Available at: http://www.ospar.org/site/assets/files/1357/mou_neafc_ospar.pdf
[137] Memorandum of Understanding between the North Atlantic salmon conservation organisation and the OSPAR Commission. 2013. Available at: http://www.ospar.org/site/assets/files/1357/nasco_mou.pdf
[138] OSPAR Commission, above n 54, 18.
[139] OSPAR Convention. Annex V. Article 4.
[140] MoU between NEAFC and OSPAR Commission, above n 136. See also: NEAFC and OSPAR Commission (2015) *The Process of Forming a Cooperative Mechanism Between NEAFC and OSPAR*. London: OSPAR.

bodies have complementary competences for fisheries management and environmental protection in the North-East Atlantic, including ABNJ. Also, under the MOU, both bodies recognised their joint interest in conserving the marine resources,[141] and agree to promote mutual cooperation through the free flow of information, [142] the management of human activities that impact the marine environment, [143] the development of a common understanding of the application of the precautionary approach,[144] a commitment to cooperate on marine spatial planning,[145] the conduct of marine science,[146] the establishment of reciprocal observer arrangements,[147] among other matters. The NEAFC/OSPAR MoU is an example of a non-legally binding approach to fill a regulatory gap in relation to ABNJ.[148]

The aforementioned coordination and cooperation arrangements adopted by OSPAR with other international bodies are relevant and ought to be taken into consideration in the design of a future management scheme for the CRD, where a putative Commission has the possibility to establish MoU with the regional fisheries organisations in the area, namely IATTC and OSPESCA, with a view to enhancing conservation measures and sustainable use[149] of biodiversity in the Central American Pacific. Furthermore, current examples of regulations taking place in the North East Atlantic region in relation to fishing gears, the implementation of area-based management tools such as the MPAs and VMEs, as well as the elimination of subsidies, the enforcement of the applicable laws by flag States, the strengthening of port controls, and the responsible consumption

[141] Ibid. Para. 1.
[142] Ibid. Para. 1.a
[143] Ibid. Para. 1.b
[144] Ibid. Para. 1.c
[145] Ibid. Para. 1.d
[146] Ibid. Para. 1.e
[147] Ibid. Para. 1.g
[148] Y. Takei, *Filling Regulatory Gaps in High Seas Fisheries: Discrete High Seas Fish Stocks, Deep-sea Fisheries and Vulnerable Marine Ecosystems* (Leiden: Nijhoff, 2013), 175-180. See also: K. Hoydal, A. H. Hole, 'Regional governance: the case of NEAFC and OSPAR,' in S. M. Garcia, J. Rice, A. Charles (eds.) *Governance for Fisheries and Marine Conservation: Interaction and co-evolution* (United Kingdom: Wiley-Blackwell, 2014), 225-238.
[149] The OSPAR Quality Status Report 2010 identified some of the main developments in fisheries management since the year 2000, which could be replicated in the CDR initiative: increased use of closed areas for stock recovery and protection of VMEs, abolition of some financial subsidies that promoted excess fishing capacity, policy on discards to reduce by-catch, introduction of area-based measures (closed areas, MPAs and gear management), targeting of IUU fishing by sharing of blacklists between regional fisheries management authorities and port States, and emergence of ecolabelling, certification for sustainable fisheries as market-driven initiatives and surveillance programmes. OSPAR Commission. OSPAR Commission, above n 24, Chapter on the use of living marine resources.

approaches demonstrate a variety of measures that together could be replicated to improve fisheries management in the CRD.

Moreover, it should also be borne in mind that OSPAR cooperative arrangements go beyond the management of marine living resources in so far as OSPAR has also concluded a MoU with the International Council for Exploration of the Sea,[150] and with the European Environment Agency,[151] as well as a Practical Agreement with the International Atomic Energy Agency.[152] In relation to shipping, OSPAR has an Agreement for cooperation with the International Maritime Organisation[153] with the view to ensure maximum coordination on common interests,[154] as well as the participation of observers in their meetings,[155] and the render of technical assistance.[156] Again, this approach could be adopted by a putative Commission for the CRD, which could develop provisions along similar line of coordination through the conclusion of an MoU or an Agreement with IMO, aimed at strengthening good environmental practices on maritime transportation in the CRD area, enhancing institutional capabilities, and the designation of special areas, such as PSSA.

On the exploration and extraction of mineral resources, OSPAR and the International Seabed Authority have agreed on a MoU,[157] reflecting their common interest of both organisations on the protection of the marine environment, including deep-sea ecosystems. In accordance with the precautionary and ecosystem based approach, the

[150] The MoU stipulates that ICES will provide scientific information and advice to OSPAR; both organisations will strengthen cooperation; ensure access to significant data; the development of cross-organisational data standardization; and that ICES Secretariat will serve as data centre. Memorandum of Understanding between the OSPAR Commission and the International Council for the Exploration of the Sea. Available at: http://www.ospar.org/site/assets/files/1357/mou_ices_ospar.pdf

[151] Memorandum of Understanding between the OSPAR Commission and the European Environment Agency. Available at: http://www.ospar.org/site/assets/files/1357/mou_eea_ospar.pdf

[152] Practical Arrangements between the International Atomic Energy Agency and the OSPAR Commission on sharing data on concentrations of radioactive substances in the OSPAR Maritime Area. Available at: http://www.ospar.org/about/international-cooperation/memoranda-of-understanding

[153] Agreement of cooperation between the International Maritime Organisation and the OSPAR Commission for the protection of the marine environment in the North East Atlantic. Available at: http://www.ospar.org/site/assets/files/1357/imo_oneils_letter_30_nov_1999_and_attachments_from_imo.pdf

[154] Agreement of cooperation between IMO and the OSPAR Commission. Para 1.

[155] Ibid. Para. 3.

[156] Ibid. Para. 5.

[157] OSPAR Commission, above n 54, 18.

MoU encourages marine scientific research to assess on distribution and conditions of vulnerable deep-water habitats, the status of populations of species and the effectiveness of conservation measures.[158] In addition, the MoU includes provisions on cooperation in the collection of environmental data[159] and the participation of experts from OSPAR and the ISA in each other meetings as observers.[160] Clearly, a MoU between a putative CRD Commission and the ISA could follow this example of best practice in so far as each organisation could benefit from each other's expertise and research regarding the identification of vulnerable ecosystems that must be protected in the CRD area.

Finally, it should be noted that OSPAR has also adopted a collective Arrangement, which provides the basis of cooperation and coordination between competent international organisations on the different activities taking place in selected sites on ABNJ in the North-East Atlantic, which are subject to specific schemes of management. [161] A similar collective Agreement could be put in place to comprehensively coordinate with other competent authorities in the Central American region.

6.2.2.6 Principles and approaches

Another cross cutting issue addressed in the BBNJ negotiation process is guiding principles. The OSPAR experience has advanced four key principles as previously noted, namely: the precautionary principle, the ecosystem approach, the polluter pays principle, the best available techniques and the best environmental practice. [162] Importantly, OSPAR Contracting Parties have a duty[163] to implement an integrated ecosystem approach[164] when adopting conservation and management measures. In

[158] Memorandum of Understanding between OSPAR Commission and the International Seabed Authority. Available at: http://www.ospar.org/site/assets/files/1357/mou_isa.pdf. Para. 2.
[159] Ibid. Para. 3.
[160] Ibid. Para. 4.
[161] OSPAR Commission. Agreement 2014/09. Collective Arrangement between competent international organisations on cooperation and coordination regarding selected areas in ABNJ in the North-East Atlantic.
[162] OSPAR Convention. Article 2.2. See also: Corley, Long, above n 27.
[163] Ibid. Annex V. Article 3, Para. 1.b(iv).
[164] The ecosystem approach is defined as the: 'comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its

fulfilling this duty, and as seen in previous paragraphs, the OSPAR Commission has developed a list of threatened and/or declining species and habitats, and has agreed specific actions to improve the status of vulnerable species and habitats. [165] Highlighted above, one of the most striking features of the OSPAR regime is the manner in which it has sought to enhance coordination and cooperation with other international organisations tasked with different aspects of ecosystem-based management (EBM). A critical element that could be replicated in the CRD initiative is the manner in which OSPAR has sought to work with other regional environmental protection organisations including the Baltic Marine Environment Protection Commission (HELCOM) as evident from their respective agreement on the Statement on the Ecosystem Approach to the Management of Human Activities.[166] This Agreement develops distinctive elements in relation to long-term integrated management of human activities;[167] the acceptance of the precautionary principle,[168] the polluter-pays principle,[169] the use of best available techniques and best environmental practice[170] as core guiding principles; coordination of conservation measures with national authorities and competent international bodies for fisheries management;[171] promotion of the acceptance of the ecosystem approach by all stakeholders; [172] monitor the marine environment, [173] set objectives for environmental quality;[174] and assess the impact of human activities upon biota and humans.[175] Including these elements in a management and conservation scheme for the CRD could consolidate the ecosystem approach in the Central American region, specifically in the ocean governance agenda.

6.2.2.7 Dispute Settlement

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dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.' OSPAR Commission. Statement on the Ecosystem Approach to the Management of Human Activities. First joint Ministerial meeting of the Helsinki and OSPAR Commissions. Bremen, Germany. June, 2003. Para. 5.

[165] OSPAR Commission. Agreement 2008-6.

[166] OSPAR Commission, above n 164.

[167] Ibid. Para. 4.

[168] OSPAR Convention. Article 2.2 (a)

[169] Ibid. Article 2.2 (b)

[170] OSPAR Commission, above n 164. Para. 8.

[171] Ibid. Para. 13.

[172] Ibid. Para. 15.a

[173] Ibid. Para. 15.b

[174] Ibid. Para. 15.c

[175] Ibid. Para. 15.d

On cross cutting issues and governance arrangements, it is notable that OSPAR has developed a sophisticated regime for dispute settlement, which accords very much with Part XV of UNCLOS.[176] Thus, for example, within the OSPAR framework, Contracting Parties, at first instance are compelled to settle disputes by means of inquiry or conciliation within the Commission.[177] Arbitration[178] is another option that is open to Parties to resolve their disputes, and various steps have been developed under the Convention concerning the constitution of an Arbitral tribunal for this purpose.[179] Any such tribunal is obliged to determine disputes on the basis of international law and OSPAR Convention provisions more specifically.[180] Any Contracting Party that has a legal interest or may be affected by the specific matter under dispute has the possibility to intervene in the process having obtained the consent of the tribunal.[181] Finally, the award of the arbitral tribunal is final and binding upon the Parties to the dispute.[182] These notions could inspire the development of a dispute settlement mechanism within the new BBNJ Agreement and provide a very useful model for the CRD. That said, it is noticeable that apart form the dispute between Ireland and the United Kingdom in relation to the commissioning of the *Mox Plant*,[183] the practice of OSPAR Contracting Parties is to settle disputes amicably and by means of negotiation.

6.2.2.8 Improvement of knowledge, monitoring and reporting

A future Commission to manage the CRD area beyond the jurisdictional waters of the Central American countries will require access to adequate data on spatial and temporal distribution of species, the status of habitats, pollution, the pressures on the marine environment and human activities taking place in the CRD. Thus it is pertinent to note that the establishment of informed decision-making processes are key elements within the OSPAR framework in so far as it provides for access to information[184] and the monitoring the quality of the marine environment.[185] In this regard, Contracting Parties

[176] OSPAR Convention. Article 32.
[177] Ibid. Article 32 (1).
[178] Ibid. Article 32 (3) to (10).
[179] Ibid. Article 32 (3.a), (4)
[180] Ibid. Article 32 (6.a)
[181] Ibid. Article 32 (9).
[182] Ibid. Article 32 (10.a)
[183] Case No. 10/2001, *Ireland* v *United Kingdom, request for provisional measure in the MOX Plant Case*. International Tribunal for the Law of the Sea.
[184] OSPAR Convention. Article 9.
[185] Ibid. Article 6. Annex IV.

are required to undertake and publish assessments on the quality status of the marine environment,[186]and the evaluation of the effectiveness of conservation measures for these ecosystems.[187] Moreover, within OSPAR, Parties have the duty to report to the Commission on the regulatory measures taken for the implementation of the Convention, as well as the effectiveness of such provisions and the challenges encountered in this regard.[188]

6.2.3 Appraisal of the OSPAR framework

UNCLOS sets universal rules in relation to the protection of the marine environment and the utilization of marine resources. The OSPAR Convention has extensive geographical scope extending from the Arctic to the Gulf of Cadiz and covers sea areas under national jurisdiction and sovereignty, as well as ABNJ. OSPAR was the first regional organisation that protected marine biodiversity in ABNJ and remains a global leader in designating MPAs on the high seas. The regional approach adopted by OSPAR Contracting Parties proves that UNCLOS and regional frameworks are dynamic and continuously evolving in light of new challenges in ocean governance. The OSPAR experience is undoubtedly an example of trial and error with some notable successes regarding the commitment of Contracting Parties to the implementation of the principles of cooperation and coordination to achieve conservation objectives, the protection of the marine environment and the sustainable management of marine resources in ABNJ.

In summary, there appears to be several aspects of the regional approach adopted by OSPAR that could be taken into consideration in the design of governance arrangements for the conservation and protection of biodiversity in other ocean regions, including the CRD. First and foremost, the OSPAR approach is treaty based and entails the application of a comprehensive regulatory framework at a regional level for the conservation of marine biodiversity through the adoption of legally binding decisions, recommendations and agreements, backed by robust monitoring schemes that are applied and enforced by Contracting Parties. The principal mechanism for

[186] Ibid. Article 6.1.a
[187] Ibid. Article 6.1.b.
[188] Ibid. Article 22.

implementation is national and EU law, including the harmonisation of national environmental policies and strategies.

The second feature is that the OSPAR framework, in line with international best practice, is principle led, namely: the precautionary principle, the ecosystem approach, the polluter pays principle and the best available techniques and the best environmental practice. Thirdly, ABMTs figure very highly on the tools applied by OSPAR including the establishment of a coherent network of marine protected areas, including MPAs in ABNJ, along with the adoption of scientific, policy and regulatory guidelines for this purpose. In parallel, OSPAR follows a list-based system for the identification and protection of threatened species and/or declining species and habitats.

From the discussion above, it is also easy to conclude that there is significant overlap between the OSPAR approach to marine environmental protection and the elements under discussion at the BBNJ negotiation process including a cross-sectorial approach to the design of management plans for ABMTs, most notably in the context of fisheries. Similarly, the obligations placed on Contracting Parties to publish joint assessments on the quality status of the marine environment, evaluations on the effectiveness of conservation measures and the identification of priorities for action are all very progressive features of the OSPAR regime. The obligation to undertake EIA and the establishment of the Code of Conduct for responsible marine research in the deep-seas and high seas of the OSPAR maritime area are also examples of best practice, as is the triggering of the application of the precautionary approach on the basis of the results of the assessment. Within the OSPAR maritime area it is also notable that the legal status of MGRs in ABNJ is not a precondition for regulating access. Nonetheless, OSPAR Contracting Parties and the EU in particular have advocated that a pragmatic approach building on existing efficient regimes such as the International Treaty on Plant Genetic Resources Multilateral System and the Nagoya Protocol is the best way forward to address this particular conundrum. Furthermore, in their view, there should be minimal administrative burdens and cost-effective institutions, facilitative access, marine scientific research conducted in accordance with UNCLOS.

OSPAR has taken a proactive approach to capacity building and technology transfer as is evident from the initiative that have been taken to assist Contracting Parties to the

Abidjan Convention. Furthermore, it is evident from the EU statements at the BBNJ Preparatory Committee, that the majority of OSPAR Contracting parties set considerable store on promoting tools that are demand-driven, ensuring national ownership and gender equality, as well as multi-stakeholder partnerships. In this context, the promotion of joint programmes and giving developing countries a more active role, rather than being mere recipients of development aid.

In the context of designing new arrangements for the Costa Rica Dome, there appears to be several examples of OSPAR best practice that could be applied in the Eastern Pacific Ocean. First and foremost, the OSPAR Convention has four coherent and inter-related objectives that could be applied elsewhere, that is to say: (1) the prevention and elimination of pollution; (2) the protection of the maritime area against the adverse effects of human activities; (3) the safeguarding of human health and the conservation of marine ecosystems: and (4) when practicable, the restoration of marine areas. The OSPAR treaty advances a solid institutional structure and decision-making procedures at a regional level, where States share information and the burden of environmental monitoring, as well as coordinating their actions in relation to the regulation of sector activities. Furthermore OSPAR Contracting Parties are open to adopting joint measures across sectors and levels, as well as engaging fully with the EU. The OSPAR institutional structures allow for the participation of observers in meetings, which increases legitimacy and transparency. Moreover, the inclusion of regionalization provisions in a putative CRD Agreement, where a Commission may decide that an adopted recommendation will apply to all the geographical area of the Convention, or just to specific marine area is a useful approach, that could well be replicated as part of the CRD initiative, as there are different capabilities among the Central American countries.

As seen, Annex V of the OSPAR Convention details criteria for identifying human activities, a valuable guidance for decision makers in regulating activities at the Dome. Similarly, the OSPAR Convention codifies several important principles and approaches to marine environmental protection and resource utilisation that could be adopted in a putative Agreement for the CRD. Most crucially, one of the key features of the OSPAR framework is the manner in which it works with other multilateral and regional seas bodies, which entails a collaborative approach and coordination with competent international authorities through the conclusion of Memoranda of Understanding,

Agreements and informal consultative meetings. This approach is characterised by agreements that are in the form of non-legally binding text that are agreed between international organisations who are competent for managing human activities in ABNJ with area specific management actions. In this approach, OSPAR is guided by internationally agreed principles and norms that aim to resolve difficulties amicably. Significantly, OSPAR has encountered greater difficulty in engaging with global organisations such as the IMO, than with regional bodies such as NEAFC.[189]

Finally it ought to be noted that the provisions on dispute settlement in the OSPAR Convention are fit for purpose and are a suitable model that could be replicated in other regional agreements in so far as they accord very much with both the letter and spirit of Part XV of UNCLOS.

6.3 ADDRESSING FRAGMENTATION AND COMPLEXITIES: THE BARCELONA CONVENTION

Threats to marine biodiversity vary in the world's oceans and regional seas. Moreover, as indicated at the beginning of this Chapter, regional approaches containing more specific rules to protect biodiversity than universal norms are therefore indispensable and are shaping a new path towards good ocean governance worldwide.[190] A second example of the importance of regional approaches to ocean governance and the protection of biodiversity can be seen in the practice of coastal States abutting the Mediterranean Sea, fourteen of whom adopted the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention, hereafter) in 1976, later amended in 1995 and renamed as the Convention for the Protection of the marine environment and the coastal region of the Mediterranean.[191]

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[189] Corley, above n 27.

[190] S. Unger (2016) 'Partnership for Regional Ocean Governance and its support for the regional seas programmes in relation to ABNJ. Regional Seas Programmes and Biodiversity in ABNJ.' *Side event at the Second Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, 6 September.

[191] Convention on the Protection of the Mediterranean Sea against Pollution. 1102 UNTS 27. Entered into force on 12 February 1978. Amended and renamed as the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean. Entered into force on 9 July 2004. See also: I. Papanicolopulu, 'The Mediterranean Sea' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015), 616-620, and Y. Tanaka (2012) 'Reflections on High Seas marine protected Areas: A comparative analysis of the Mediterranean and the North-East Atlantic Models, *Nordic Journal of International Law*, Vol. 81, 295.

Currently, the Barcelona Convention has 22 Contracting Parties, 21 Mediterranean littoral countries and the European Union.[192] The Convention and related instruments (referred to as the Barcelona system, as will be seen below) provides a solid legal basis for Mediterranean coastal States to pioneer the development of cooperative arrangements, the adoption of common objectives and the establishment of institutional frameworks to achieve shared goals pertaining to the preservation and protection of the marine environment.[193] However, the region poses a particular challenge to manage from an ocean governance perspective due to the complex geopolitical situation in the eastern area of the basin, as well as the absence of uniformity in relation to the maritime zones claimed by the coastal States, which could ultimately jeopardize the conservation of marine biodiversity in ABNJ. In particular, the Mediterranean States have established a variety of coastal zones and several maritime boundaries have yet to be determined and delimited.[194] Despite these difficulties, the preamble to the Barcelona Convention notes that Contracting Parties are fully aware of their responsibility to preserve and sustainably develop the resources of the Mediterranean Sea,[195] are mindful of its vulnerability to pollution,[196] and acknowledge the need for close cooperation in a coordinated regional approach for the protection of the marine environment.[197] Accordingly, Contracting Parties have adopted the Barcelona Convention to advance the protection of the marine environment and its biodiversity in the Mediterranean Sea, and within this regional approach they "seek to regulate various sources of marine pollution in a manner than one scholar has described as quasi-comprehensive."[198]

The geographical scope of the Barcelona Convention covers the maritime waters of the Mediterranean Sea, irrespective of the legal status of the waters both within and beyond

[192] Contracting Parties to the Barcelona Convention are the following: Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, European Union, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Syria, Tunisia, Turkey. Available at: http://web.unep.org/unepmap/
[193] Papanicolopulu, above n 191, 616.
[194] T. Scovazzi (ed.) (2011) *Note on the establishment of marine protected areas beyond national jurisdiction or in areas where the limits of national sovereignty or jurisdiction have not yet been defined in the Mediterranean Sea*. Tunis: UNEP-MAP-RAC/SPA, 30.
[195] Barcelona Convention. Recital 2.
[196] Ibid. Recital 4.
[197] Ibid. Recital 6.
[198] Y. Tanaka, *The International Law of the Sea,* 2 ed., (Cambridge: CUP, 2015), 274.

national jurisdiction.[199] In the words of the Convention, it applies to the maritime waters of the Mediterranean as such, with all its gulfs and tributary seas, bounded to the west by the Strait of Gibraltar and to the east by the Dardanelle Strait.[200] Significantly from the perspective of this study, it should also be noted that the seabed of the Mediterranean Sea constitutes continental shelf of the coastal States and that the area beyond national jurisdiction is accordingly limited to the high seas. Furthermore, should all of the coastal States in the Mediterranean Sea establish EEZs, then the whole sea-basin will come within national jurisdiction. That said, the Convention establishes a system of inter-State cooperation for the protection of the Mediterranean semi-enclosed sea and it was the first Regional Seas Agreement concluded under the sponsorship of the United Nations Environment Program for this purpose.[201]

The Convention aims to prevent and control marine pollution,[202]ensure sustainable management of marine and coastal resources,[203] as well as to protect the marine environment and coastal zones.[204] In a similar way to OSPAR, the Barcelona Convention endorses the utilization of the best available techniques and the best environmental practices as guiding principles.[205] In relation to the conservation and sustainable use of resources found in ABNJ, the Convention calls upon Parties to take appropriate measures to prevent and combat pollution resulting from the exploration and exploitation of the continental shelf, the seabed and its subsoil within the Mediterranean area.[206] A similar provision could be considered in a future Agreement for the conservation of marine biodiversity in the CRD, as the exploration for oil and minerals is a rapidly advancing industry throughout various regions of the world.

From an operative and practical viewpoint, the Barcelona Convention is a framework treaty implemented by seven Protocols,[207] which address different elements related to

[199] Barcelona Convention. Article 1.
[200] Ibid. Article 1.
[201] P. H. Sand (1987) 'The rise of regional Agreements for marine environment protection,' *The Law and the Sea: Essays in memory of Jean Carroz*, 225. See also: UNEP (1975) *Report on the Intergovernmental meeting on the protection of the Mediterranean*. Barcelona: UNEP/WG.2/5. Annex.
[202] Barcelona Convention. Article 4 (1).
[203] Ibid. Article 4 (3).
[204] Ibid. Article 4 (3.e).
[205] Ibid. Article 4 (4.d)
[206] Ibid. Article 7.
[207] D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015), 617.

the prevention of pollution,[208] protected areas and marine conservation,[209] hazardous wastes,[210] integrated coastal zone management,[211] offshore mining,[212] among others. As such, the so-called 'Barcelona system' has evolved progressively over the past four decades from a treaty focused initially on vessel source pollution to a matrix of instruments that address regional pollution and related matters in a relatively comprehensive and integrated manner, including most notably the conservation of marine biological diversity.[213]

The application of the Specially Protected Areas and Biological Diversity Protocol[214] (SPA/BD Protocol, hereafter) is critical to the subject matter of this study and will thus be examined in greater detail below. Worth mentioning at this point is the flexibility evident in the development of these instruments, which shows the disposition and commitment of Contracting Parties in adapting the regulatory frameworks to the new challenges faced in establishing a system of ocean governance in the Mediterranean Sea. This particular adaptive element has been recognised by UNEP who has pointed out that,

> The updating and the additions to the Barcelona Convention legal system show that the Parties consider it as a dynamic body capable of being subject to re-examination and improvement. The Protocols even display a certain degree of legal imagination in finding constructive ways to address complex environmental problems.[215]

The progressive nature of this approach speaks for itself and it goes without saying that equivalent flexibility and adaptability should guide the future CRD governance scheme in the Eastern Pacific Ocean.

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[208] Protocol for the prevention of pollution in the Mediterranean Sea by dumping from ships and aircraft, and the Protocol for the protection of the Mediterranean Sea against pollution from land-based sources and activities.
[209] Protocol concerning Specially protected areas and biological diversity in the Mediterranean (SPA/BD, hereafter).
[210] Protocol on the prevention of pollution of the Mediterranean Sea by transboundary movements of hazardous aastes and their disposal.
[211] The Protocol on integrated coastal zone management in the Mediterranean.
[212] The Protocol for the protection of the Mediterranean Sea against pollution resulting from exploration and exploitation of the Continental Shelf and the seabed and its subsoil.
[213] Y. Tanaka, *A Dual Approach to Ocean Governance: The cases of the zonal and integrated management in international law of the sea* (Farnham: Ashgate, 2008), 193.
[214] SPA/BD, above n 209.
[215] Scovazzi, above n 194, 30.

Good ocean governance is underpinned by strong institutional structures that provide a strong plinth for regional cooperation and that minimize the risk of conflict. Notable achievements in this regard is that the Barcelona Convention and its Protocols have also created an institutional framework to direct the work of the Contracting Parties and to guide implementation of the regulatory and policy framework. The bodies established for this purpose are the Meeting of the Parties, the Bureau, the Coordination Unit, the Mediterranean Commission on Sustainable Development and six Regional Activities Centres (RACs).[216] Given that the Mediterranean is a more complex geo-political sea-basin than the Central American Pacific where the Dome occurs, it could be argued that the latter requires a more simple slime-line institutional structure that meets the needs of the region. As will be seen in chapter 9, for example, the it could be made-up of a decision making body, a scientific committee, a compliance committee and regional coordination units or focal points tasked to ensure the effective implementation of conservation measures from a putative Agreement for the CRD.

From an integrated and holistic planning perspective, another key tool that facilitates the implementation of the Barcelona Convention is the Action Plan for the protection of the marine environment and the sustainable development of the coastal areas of the Mediterranean.[217] Similar to the institutional arrangements from the SICA in Central America, the institutional structure of the Action Plan is based upon decisions taken by the Ministerial level of Contracting Parties and the enforcement of recommendations at the national level with the assistance of the national focal points. Pointedly, a distinctive feature of this particular framework is that the Action Plan is operationalized by six Regional Activity Centres (RAC) located in the territories of the Contracting Parties. Specifically, the role and mandate of the Specially Protected Areas Regional Activity Centre (SPA/RAC) is particularly germane to this study given that its focus is on biodiversity conservation and the protection of Mediterranean species, their habitats and ecosystems, and the development of management plans and monitoring tools.[218] Accordingly, this approach merits more detailed consideration below.

[216] Rothwell, Oude Elferink, Scott, Stephens, above n 207, 617.
[217] UNEP (1995) Report of the 9th ordinary meeting of Contracting Parties to the Barcelona Convention. Athens: UNEP(OCA)/MED IG.5/16. Annex X.
[218] SPA/BD Protocol. Article 25.

6.3.1 Protection of marine biodiversity under the Barcelona Convention system

The conservation of biological diversity is a key goal of the Barcelona Convention, which requires Contracting Parties to take all appropriate measures to protect biodiversity, rare or fragile ecosystems, and vulnerable species.[219] There are several features of biodiversity protection advanced by the Convention and related instruments.

First, and as mentioned above, one of the strategic mechanisms to protect biodiversity under the Barcelona Convention is outlined in the Protocol of specially protected areas and biological diversity in the Mediterranean.[220] In particular, the SPA/BD Protocol spells out in further detail how the conservation and management objectives are to be achieved in so far as it requires Parties to take the necessary measures to protect and manage areas of particular natural or cultural value, by establishing specially protected areas (SPAs); as well as to protect threatened or endangered species, and adopt strategies and programs for the conservation of biological diversity,[221] among other management measures. These particular objectives could be replicated in a legal instrument governing the CRD, given the wide range of vulnerable species and habitats that populate the Central American Pacific. In addition and of interest to the CRD, there is also scope for Contracting Parties to the SPA/BD Protocol to adopt more specific protection measures in relation to all or any of the following in the relevant maritime areas that are subject to their national sovereignty and jurisdiction: the regulation or prohibition of fishing or hunting, [222] the regulation or prohibition of activities involving the exploration or exploitation of the subsoil of the seabed or its subsoil,[223] the regulation of the passage of ships, stopping or anchoring,[224] and the regulation of activities that are likely to harm, disturb or endanger ecosystems or species, among others.[225]

Secondly, in terms of other spatial management instruments under the Convention, Contracting Parties have been proactive and established a List of Specially Protected

[219] Barcelona Convention. Article 10.
[220] SPA/BD Protocol. Article 8.
[221] Ibid. Article 3.
[222] Ibid. Article 6.g
[223] Ibid. Article 6.e
[224] Ibid. Article 6.c
[225] Ibid. Article 6.h

Areas of Mediterranean Importance, also known as the SPAMI's List, which is aimed at improving the conservation of natural heritage in the Mediterranean.[226] For this purpose, the Protocol provides criteria[227] for the selection of MPAs that should be included in the SPAMI's List, as well as the procedure for their designation.[228] Once an area is included on the List, the Contracting Parties must respect the conservation measures adopted for the specific MPA.[229] At the time of writing, there were 34 sites that have been enumerated on the SPAMI List,[230] with the Pelagos Sanctuary applying partly to the high seas. Other sites in this list are protected areas within national jurisdiction, comprising marine habitats like archipelagos and islands, including the Embiez Archipelago (France), the Kneiss Islands (Tunisia), the Palm Islands Nature Reserve (Lebanon), the Habibas Islands (Algeria), and other marine ecosystems like the Sea Bottom of the Levante of Almeria (Spain). Interesting to note is that Italy, Spain, Tunisia and France had included more sites to the SPAMI list than other Mediterranean Contracting Parties.[231]

Crucially in light of the unique geographical nature of the maritime zones claimed by coastal States, an innovative element from the SPA/BD Protocol is the possibility of establishing trans-boundary protected areas [232] and high seas MPAs in the Mediterranean Sea.[233] The SPA/BD Protocol is therefore an example of an instrument that facilitates Parties to the Barcelona Convention regulating areas not subject to their sovereignty or jurisdiction.[234] This approach is crucial in the design of a future conservation scheme for the CRD, particularly in the Papagayo upwelling system and the adjacent EBSA that satisfy the scientific criteria for designation. As will be seen later in this study, the EBSA declaration could be used as the legal basis for the creation of an MPA at the Dome's high seas area.[235] Moreover, a specific procedure could be included in a future Agreement for the Dome similar to the one outlined in the SPA/BD

[226] Ibid. Article 8.
[227] Ibid. Article 8.2
[228] Ibid. Article 9
[229] Ibid. Article 9.5
[230] Regional Activity Centre for Specially Protected Areas. *Specially Protected Areas of Mediterranean Importance*. Available at: http://www.rac-spa.org/sites/default/files/doc_spamis/liste_aspim_2016.pdf
[231] Ibid.
[232] SPA/BD Protocol. Article 5.
[233] T. Scovazzi (2004) 'Marine Protected Areas on the high seas: Some legal and policy considerations,' *International Journal of Marine and Coastal Law* Vol. 19(1), 11–13.
[234] Papanicolopulu, above n 191, 618. See also: Tanaka, above n 191, 295.
[235] See Chapter 9.

Protocol for the Mediterranean Sea.[236] For instance, the SPA/BD Protocol indicates that proposals for the inclusion of a protected area situated partly or wholly on the high seas may be submitted by two or more neighbouring Parties,[237] which are obliged to consult each other to ensure consistency on the proposed protection and management measures.[238] Thereafter, the proposal is submitted for review in conformity with the procedures and the institutional structure set out in the Protocol.[239] The Parties must then by consensus, decide whether or not to include the high seas MPA on the SPAMI List, and agree on the most appropriate management measures. [240]

Finally, on compliance and enforcement, the Parties that propose the inclusion of the specific area in the list, must implement the protection and conservation measures specified in their national proposals.[241] Arguably, a weakness in this approach is there are no regional arrangements for undertaking enforcement and compliance beyond national jurisdiction.[242] Nonetheless, this structured formula could be replicated in the CRD initiative, where neighbouring countries such as Costa Rica and Nicaragua, or indeed El Salvador and Guatemala, could submit a proposal for the establishment of a high seas MPA and include it into a list of protected areas from the Central American Region developed by the CCAD,[243] following an internal process of approval within the institutional framework established in CCAD for the conservation of marine biodiversity.

Experience has demonstrated that the regional Working Programme for the coastal and marine protected areas in the Mediterranean Sea including the high seas is a valuable tool for operationalizing management measures.[244] The programme sets down the

[236] SPA/BD Protocol. Article 9
[237] Ibid. Article 9.2
[238] Ibid. Article 9.3
[239] Ibid. Article 9 (4.a), (4.c)
[240] Ibid. Article 9 (4.c)
[241] Ibid. Article 9.5
[242] R. Long, 'The Anthropocene, autopoiesis and the disingenuousness of the genuine link: Addressing enforcement gaps in the legal regime for areas beyond national jurisdiction' (Commentary on Rosemary Rayfuse) in A. Oude Elferink & E. J. Molenaar (Eds.), *The international legal regime of areas beyond national jurisdiction: Current and future developments* (The Hague: Martinus Nijhoff, 2009), 196.
[243] As seen in Chapter 5, the CCAD has a mandate to develop a list of protected areas under article 36 of the Convention for the conservation of biodiversity and protection of priority wildlife areas in Central America.
[244] UNEP (2009) *Regional Working Programme for the Coastal and Marine Protected Areas in the Mediterranean Sea including the High Seas*. Tunis: UNEP-MAP RAC/SPA,

criteria for establishing a representative network of marine protected areas in the Mediterranean Sea.[245] However, the experience in this region is little different from initiatives elsewhere. Similar to OSPAR, there is still a geographical imbalance in MPAs between the Southern Eastern and Northern shores of the Mediterranean, in so far as the majority of MPAs are situated close to the coast, therefore the network is not fully representative of all the Mediterranean eco-regions.[246] Moreover, and as mentioned at the beginning of this section, the reluctance of some coastal States in establishing EEZs in the Mediterranean Sea and the unique geographical nature of the sea-basin has further complicated the process of a establishing a successful MPA network on the high seas. However, the latter obstacle is not a problem for coastal States in Central America, who have all established EEZs on their Pacific coasts.

In relation to third Parties, the approach is largely facilitative in so far as these are invited to cooperate in the implementation of the SPA/BD Protocol and to adopt measures to avoid activities contrary to the regulatory objectives of conservation.[247] Cooperation between parties and non-parties is thus vital to ensure the effectiveness of conservation measures, both in the Mediterranean Sea region and in relation to the CRD.

6.3.1.1 Seeking for a regional approach to climate change mitigation and adaptation

As emphasised elsewhere in this thesis,[248] special attention needs to be given to the effects of climate change in designing ocean governance structures and regulatory frameworks. Indicatively, the IPCC Fifth Assessment Report considers the Mediterranean Region as "highly vulnerable to climate change and it is anticipated that the region will suffer multiple stresses and systemic failures due to the effects of climate change."[249] In this sense, the Mediterranean Sea has long been identified by the

[245] Ibid. 6
[246] C. Gabrié, et al., *The Status of the Marine Protected Areas in the Mediterranean Sea* (France: MedPAN & RAC/SPA, 2012), 15.
[247] SPA/BD Protocol. Article 28.
[248] Chapters 2, 8.
[249] R. S. Kovats, et. al., (2014) 'Europe' in *Climate Change 2014: Impacts, adaptation, and vulnerability. Part B: Regional aspects. Contribution of working group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, (United Kingdom and New York: Cambridge University Press, 2014), 1303.

scientific community as a global climate change hot spot.[250] Indeed, the effects are well documented, namely: changes in provisioning and regulating services,[251] shifting on spatio-temporal patterns of biodiversity,[252] and distress of iconic and particularly vulnerable ecosystems, such as the Seagrass meadows, the Vermetid reefs, the Coralligenous reefs and species like the red corals.[253] These effects puts at risk the economic benefits provided by the Mediterranean Sea such as the employment and revenue generated from fishing[254] and tourism activities.[255]

Clearly, the designation of MPAs by themselves will not prevent detrimental effects of climate change on the environmental status of biological diversity. In this respect, the response has been relatively pragmatic with the Contracting Parties of the Barcelona Convention adopting the Regional climate change adaptation framework for the Mediterranean marine and coastal areas.[256] The Framework is structured around four strategic objectives, namely: (1) appropriate institutional and policy frameworks, increased awareness and stakeholder engagement, and enhanced capacity building and cooperation; (2) development of best practices for effective and sustainable adaptation to climate change impacts; (3) access to existing and emerging finance mechanism; and (4) better informed decision-making through research and scientific cooperation and availability and use of reliable data, information and tools.[257]

One of the principal features of the Framework is the establishment of a cross-border collaborative and coordinated approach to adaptation,[258] which aims to increase the resilience of the Mediterranean marine and coastal natural and socioeconomic systems

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[250] F. Giorgi (2006) 'Climate change hot spots,' *Geophysical Research Letters*, Vol. 33. The Mediterranean has already warmed nearly 1 °C over the last 25 years and the acidity of Northwestern Mediterranean seawater has increased by 10 per cent since 1995. European Project Mediterranean Sea Acidification in a changing climate (MedSeA). *10 Facts on ocean acidification and warming of the Mediterranean Sea*. Available at: http://medsea-project.eu/wp-content/uploads/2015/02/10FACTS-short-final.pdf

[251] F. Bosello, E. Delpiazzo, F. Eboli (2015) 'Acidification in the Mediterranean Sea: impacts and adaptation strategies,' *Review of Environment, Energy and Economics*.

[252] MedSeA, above n 250.

[253] MedSeA (2011) *Tipping the balance: CO2 and the Mediterranean Sea*. Available at: http://medsea-project.eu/wp-content/uploads/2011/08/MRUG-leaflet_lowresolut_def.pdf

[254] T. Lacoue-Labarthe, et. al., 'Impacts of ocean acidification in a warming Mediterranean Sea: An overview,' *Regional Studies in Marine Science*, Vol. 5, 1-11.

[255] European Project (MedSeA), above n 250.

[256] UNEP Decision IG.22/6. 399-418.

[257] Ibid. 22.

[258] Ibid. 406, para. 3.

to the impacts of climate change, thereby assisting policy makers and stakeholders.[259] The Framework urges the Contracting Parties to adopt appropriate measures in their national and local integrated coastal zone management and climate change adaptation plans.[260] As noted above, the Central American Region is a vulnerable region to extreme weather events and other climate change impacts, and should therefore reinforce its current Regional Strategy on Climate Change,[261] perhaps along similar lines to the approach adopted for the Mediterranean Sea.

6.3.2 Links between the Barcelona Convention and a new Agreement for the conservation of biodiversity in ABNJ

As it will be addressed in further detail in chapter 8, the BBNJ negotiation process is aimed at developing a legally binding instrument to address the conservation and sustainable use of marine biodiversity in ABNJ. In this regard, regional governance models, like the one advanced by the Barcelona Convention, are important templates from which crucial lessons can be derived regarding the conservation and sustainable use of biodiversity beyond the maritime boundaries of coastal States. Four features of the Barcelona Convention system are mentioned here: normative guiding principles; capacity building; environmental impact assessment; and the liability regime.

Guiding principles are a key crosscutting issue within the BBNJ negotiation process and it is significant that important environmental principles and approaches are incorporated into the Barcelona Convention as part of its normative framework with a view to informing and guiding the actions of States Parties. Within the regional framework, for example, States Parties are required to apply the precautionary principle[262] the polluter pays principle,[263] as well as the ecosystem approach. The latter is applicable to the management of human activities that may affect the Mediterranean marine and coastal environment, [264] including the "regulation of marine resource use and activities, control of land-based and maritime sources of pollution, integrated

[259] Ibid. 406, para. 4.
[260] Ibid. Recital 3.
[261] CCAD (2010) *Regional Strategy on Climate Change*. Available at: http://www.sica.int/busqueda/secciones.aspx?IdItem=55544&IdCat=48&IdEnt=879
[262] Barcelona Convention. Article 4 (3.a).
[263] Ibid. Article 4 (3.b).
[264] UNEP Decision IG 17/6. Implementation of the ecosystem approach to the management of human activities that may affect the Mediterranean marine and coastal environment. Recital 6.

coastal zone/ocean management, and an adaptive management approach to deal with rapidly changing patterns of use as well as with technological, socio-economic, political and natural change." [265] Notably, the ecosystem approach methodology adopted pursuant to the Barcelona Convention could also be replicated in the CRD, in so far as it includes elements such as the definition of an ecological vision, the identification of important ecosystems and assessment of ecological status, the development of ecological and operational objectives, among others.[266] Moreover, under Decision IG.20/4,[267] Barcelona Convention States Parties have reaffirmed their commitment to continue to apply the ecosystem approach and for this purpose have established specific ecological and operational objectives with indicators,[268] as well as a timeline and roadmap governing implementation.[269] Complementary decisions under the regulatory framework have been taken to further support the implementation of the ecosystem approach through the creation of a Mediterranean good environmental status and related targets, [270] as well as through the adoption of integrated monitoring and assessment programmes (IMAP).[271] The latter is a key achievement of the Barcelona Convention Parties for the Mediterranean region, as it provides a legal basis for undertaking an assessment of the status of the marine environment including biodiversity, non-indigenous species, marine litter as well as other indicators of the health of marine ecosystems, as part of the process of implementing the ecosystem approach during the period 2016-2021,[272] and it is anticipated that a Quality Status Report will be published in 2017.[273]

In view of the Dome's unique spatial configuration, it is worth taking into account that the application of ecosystem approach ought to facilitate marine resource management in areas where Central American countries have yet to delimit their maritime boundaries and the extent of maritime jurisdiction thus remains undetermined.[274]

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[265] G. Notarbartolo di Sciara (2009) *The Pelagos Sanctuary for the conservation of Mediterranean marine mammals: An iconic high seas MPA in dire straits*. Italy: Tethys Research Institute.
[266] UNEP Decision IG 17/6. Recital 7.
[267] UNEP Decision IG.20/4.
[268] Ibid. Annex II.
[269] Ibid. Annex III.
[270] UNEP Decision IG.21/3. Annex II.
[271] UNEP Decision IG.22/7.
[272] Ibid. 2.
[273] Ibid. 3.
[274] See in Chapter 2.

Another important element of the BBNJ process is the inclusion of capacity building and technology transfer as part of the package deal for negotiation. On this particular issue, there are some notable achievements within the Mediterranean region in so far as the Regional Activity Centre for Specially Protected Areas invests and coordinate training programmes annually, along with management tools, on-line resources, and national training sessions, [275] just to mention a few examples of the practical measures that can be implemented at a regional seas level. Also, with a view to ensuring coordination and technical support, a clearing house or central information centre on Mediterranean biodiversity is included in the Strategic Action Program of the Regional Activity Centre for Specially Protected Areas. This tool has the objective to become a catalyst of joint initiatives and exchange, as well as to be coordinated and linked to the clearing-house mechanism of the CBD.[276] A similar instrument could be developed for the CRD, as there is a pressing need for the development of appropriate scientific skills at a regional level.

In relation to environmental impact assessment (EIA), which is one of the four main elements under negotiation at the BBNJ process, the Barcelona Convention requires Parties to undertake EIAs for proposed activities that are likely to cause a significant adverse impact on the marine environment.[277]Furthermore, it promotes cooperation on notification, exchange of information and consultation between States in relation to the assessment of activities under their jurisdiction or control, which are likely to have a significant adverse effect on the marine environment of other States or in ABNJ.[278] As noted by Warner, "this provision recognizes the mandatory responsibility of Contracting Parties to protect and preserve the marine environment beyond national jurisdiction in their region."[279] Further detail on the procedures are set out in the SPA/BD Protocol, which requires Contracting Parties to evaluate the possible impact, including cumulative impacts, of the projects and activities that could significantly

[275] G. Di Carlo, A. Lopez. F. Staub (2012) *Report: Capacity building strategy to enhance the management of MPAs in the Mediterranean Sea*. Commissioned by WWF MedPO/MedPAN/UNEP/MAP/RAC/SPA. 7, 10, 11, 12.
[276] RAC/SPA (2004) Strategic Action Programme for the Conservation of Biological Diversity in the Mediterranean. Tunis: UNEP-MAP-RAC/SPA, 38.
[277] Barcelona Convention. Article 4 (3.c).
[278] Ibid. Article 4 (3.d).
[279] R. Warner, 'Environmental assessment in marine areas beyond national jurisdiction' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 299.

affect protected areas, species and their habitats.[280] Similar requirements could be included in a putative Agreement for the conservation of the CRD.

Finally, liability is one of the crosscutting issues under review in the BBNJ negotiation process. Instructively, in this regard, the Barcelona Convention requires Contracting Parties to cooperate on liability and compensation for environmental damage due to pollution.[281] Following on from this, Contracting Parties have developed the Guidelines for the determination of liability and compensation for damage resulting from pollution on the marine environment in the Mediterranean Sea area,[282] and with a view to advancing the polluter pays principle. Even though these Guidelines are not considered a legally binding instrument *per se*,[283] Contracting Parties are urged to include provisions on environmental damage compensation in their national legislation[284] and to impose liability on operators who cause damage to the marine environment.[285] Additionally, the Guidelines specify that compensation for environmental damage should include: a) costs of activities and studies to assess the damage, b) costs of preventive measures, c) costs of measures undertaken to clean up, restore and reinstate the impaired environment, among other requirements.[286] Finally, the Guidelines provide for the establishment of a Mediterranean Compensation Fund without setting down any binding commitment on this subject. That is the reason why non-mandatory Guidelines, and not a Protocol, were drafted and Contracting Parties only committed to exploring the possibility of utilizing a compensation fund to redress damage to the marine environment.[287]

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[280] SPA/BD Protocol. Article 17.
[281] Barcelona Convention. Article 16.
[282] UNEP Decision IG 17/4.
[283] Ibid. Para. 3
[284] Ibid. Para. 8
[285] Ibid. Para. 17
[286] Ibid. Para. 10. The Annex of the Guidelines includes additional references of compensation regimes.
[287] Ibid. Para. 29. See also: UNEP (1997) *Report on the 1st meeting of Government-designated legal and technical experts on the preparation of appropriate rules and procedures for the determination of liability and compensation for damage resulting from pollution of the marine environment in the Mediterranean Sea area*. Athens: UNEP, para. 29, and T. Scovazzi (2009) 'The Mediterranean Guidelines for the determination of environmental liability and compensation: The negotiations for the instrument and the question of damage that can be compensated,' in A. von Bogdandy and R. Wolfrum (eds.), *Max Planck Yearbook of United Nations Law,* Vol. 13, 209.

Nonetheless, a mandatory approach to compensation could be addressed in the BBNJ instrument, as well as in a putative Agreement for the CRD. The Fund aims to address cases where damage exceeds the operator's liability, or where the operator is unknown, ensuring redress and compensation for damaging the marine environment in such instances.[288] Moreover, the Barcelona Convention,

> Carefully balances the sovereignty of the State over its vessels and the duties on the protection of the marine environment, providing for a comprehensive protection against pollution by vessels enjoying sovereign immunity, which have been included in the scope of the Convention, even though their immunity from the jurisdiction of States other than the flag State is preserved.[289]

In relation to the Guidelines on the aforementioned fund, there are some important parallels and lessons to be drawn from the recent jurisprudence of international courts and tribunals on the issue of liability for environmental damage. Instructively, one of the issues that the Seabed Disputes Chamber of ITLOS addressed in the Area Advisory Opinion concerned the limits of State liability when a contractor that a State is sponsoring to explore or exploit the seabed in areas beyond national jurisdiction causes damage or harm to the marine environment. This raises an important question regarding state responsibility and the limits of legal risks, as well as the evolutionary nature of international law. The Tribunal reasoned that the conditions for the liability of the sponsoring State to arise are twofold: (a) failure to carry out its responsibilities under the Convention; and (b) occurrence of damage. Moreover, the sponsoring State is absolved from liability if it has taken "all necessary and appropriate measures to secure effective compliance"[290] by the sponsored contractor with its obligations. The general rules of international law in relation to liability thus apply. Moreover, acknowledging that the emerging trend is reflected in the International Law Commission's principles on the allocation of loss in the case of trans-boundary harm arising out of hazardous activities, the Tribunal held that the "regime of international law on responsibility and liability is not ... static [and] opens the liability regime for deep seabed mining to new

[288] Ibid. Para. 29.
[289] Papanicolopulu, above n 191, 618-619.
[290] *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, ITLOS Case No. 17 (Advisory Opinion). 2011.

developments [customary or conventional] in international law."[291] Furthermore, in refuting the requirements of strict liability (despite arguments to the contrary), the Chamber suggests that a possible solution could be the establishment of a trust fund for the purpose of redressing damage or harm to the marine environment or by means of the mining regulations. Following on from this, the Tribunal found that the Convention requires the sponsoring State to adopt, within its legal system, laws and regulations and to take administrative measures that have two distinct functions, namely, to ensure compliance by the contractor with its obligations and to exempt the sponsoring State from liability. The case is also notable in so far as it sets the highest standards of due diligence and endorses a legal obligation to apply precaution, best environmental practices, and EIA to mining activities in areas beyond national jurisdiction, which very much mirrors the approach advanced by the BBNJ negotiations.

6.3.3 Replicating lessons from the Mediterranean

There are several lessons that can be derived from the approach adopted by Contracting Parties to the Barcelona Convention that may be replicated and applied with a view to establishing a proactive marine conservation regime in the ABNJ of the Central American Pacific region. Three particular features are reviewed below.

6.3.3.1 Establishment of MPAs in ABNJ and the danger of paper parks

One of the first instances of the establishment of high seas MPAs can be traced back to the establishment of the so-called Pelagos Sanctuary for eight species of cetaceans, which is partly situated on the high seas of the Mediterranean Sea and is therefore of particular relevance for the current study. The sanctuary has a legal basis in a 1999 Agreement on the Creation of a Sanctuary for Marine Mammals concluded by France, Italy and Monaco.[292] The sanctuary is relatively large at 87,500 km^2 (96,000) encompassing waters with different juridical spatial regimes including internal waters, territorial sea and the high seas.[293] In a similar manner to the oceanographic features

[291] Ibid.
[292] The International Agreement on the Creation of a Marine Mammal Sanctuary. 2176 UNTS 247. Entered into force 21 February 2002.
[293] G. Norbartolo di Sciara, D. Hyrenbach, T. Agardy (2008) 'The Pelagos sanctuary for Mediterranean marine mammals case study,' *Lessons in Conservation*, Vol. 2, 93, 99.

associated with the CRD, the water currents in the sanctuary create optimum conditions for a high productivity frontal system, favouring plankton growth and abundance of krill, ideal for pelagic species,[294] as well as forming the habitats of large populations of eight marine mammal species, including several cetacean species.[295] Prior to the creation of the sanctuary, these populations were at risk due to the intensive nature of human activity in the Mediterranean Seas,[296] as evidenced by the frequency of mammal strandings and the high levels of cetacean by-catch in the driftnet fishery.[297]

Relevant to the present study, it is significant to note that the impetus for the establishment of the sanctuary was largely driven by lacunae in the law of the sea and the need to advance marine conservation in ABNJ within the Mediterranean region. As noted in one study:

> The opportunity to establish a tri-national marine protected area was, paradoxically, created by the lack of mechanisms for protecting the high seas, since Mediterranean countries have not yet declared 200-mile Exclusive Economic Zones (EEZs), and no legal framework existed for management of marine areas outside of the 12-mile territorial seas.[298]

The Pelagos Marine Sanctuary was aimed at addressing three concerns: a) the presence of cetacean species in the Ligurian Sea,[299] b) the risk and significant threats to these cetaceans, and c) inadequate existing legal framework to protect biodiversity in the high seas of the Mediterranean.[300] The same issues are clearly evident in the CRD, where the presence of endangered species and the lack of an appropriate legal

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[294] Ibid. 95.
[295] Ibid. 93.
[296] In addition to fishing, other major anthropogenic impacts on the Mediterranean marine environment are maritime traffic, including high-speed passenger vessels, pleasure craft, naval ships and expanding commercial whale watching activity, with the risk of disturbance and collisions. G. Notarbartolo di Sciara, T. Agardy, D. Hyrenbach, T. Scovazzi, P. Van Klaveren (2007) 'The Pelagos Sanctuary for Mediterranean marine mammals,' *Aquatic Conservation: Marine and Freshwater Ecosystems*, Vol. 18.
[297] Norbartolo di Sciara, Hyrenbach, Agardy, above n 293, 93.
[298] Ibid.
[299] Important cetacean habitats and populations have been recognized within a wide marine area between Corsica and the continental coasts of France and Italy, known as the Corsican-Ligurian-Provençal basin. J. Forcada, G. Notarbartolo di Sciara, F. Fabbri (1995) 'Abundance of fin whales and striped dolphins summering in the Corso-Ligurian Basin,' *Mammalia*, Vol. 59(1), 127-140.
[300] Norbartolo di Sciara, Hyrenbach, Agardy, above n 293, 94.

framework demand further regulatory action to secure the sustainability and conservation of the biodiversity associated with the Dome. Furthermore, there have been significant developments in relation to the management of fishery impacts on cetaceans following the global moratorium on large-scale pelagic drift net fishing. [301] Also, a revision of the Specially Protected Areas Protocol in 1995 "to reflect the developments in international environmental law following the Earth Summit" [302] resulted in the inclusion of the Pelagos Sanctuary on the SPAMIs List. [303] A year later, the Agreement was ratified by Monaco, France and Italy and the MPA entered into force.[304]

There are a number of parallels between developments the Pelagos Sanctuary and the CRD initiative with respect to civil society engagements. With the benefit of hindsight, it is evident that growing public awareness led by non-governmental organisations (NGOs)[305] played an important role in the designation of the first high seas MPA in the Mediterranean Sea.[306] Furthermore, the Pelagos Sanctuary exemplifies the pioneering role that NGOs can play in the design of an MPA.[307] In the CRD initiative, a similar experience is building up, with the involvement of civil society and a variety of NGOs pushing for the protection and sustainable use of marine biodiversity associated with the Dome.[308] Since its creation the Pelagos Sanctuary has many positive features in so far as it acted as a catalyst in raising public awareness of the need to protect cetaceans from anthropogenic impacts. Moreover the regulatory response came in the form of coordinated action and cooperative measures by the three governments to minimize environmental impacts on the area. Furthermore, the designation process demonstrated

[301] T. Scovazzi (1998) 'The enforcement in the Mediterranean of United Nations resolutions on large-scale driftnet fishing,' in J. A. Frowein and R. Wolfrum (eds.), *Max Planck Yearbook of United Nations Law*, Vol. 2.
[302] N. Oral, 'Forty years of the UNEP Regional Seas Programme: From past to future' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 348.
[303] Norbartolo di Sciara, Hyrenbach, Agardy, above n 293, 95.
[304] Ibid. 99.
[305] The European Association Rotary for the Environment and Tethys Research Institute proposed a project to promote the establishment of a marine protected area in the high seas, encompassing the most important habitat for cetaceans in the region. Afterwards, the proposal was supported by other NGOs including WWF and IUCN. Ibid 20
[306] Ibid. 95.
[307] Ibid. 103.
[308] Since 2012 MarViva Foundation has been promoting the Costa Rica Thermal Dome Initiative to ensure its sustainability. The initiative focuses efforts on the Dome´s core area located in ABNJ. MarViva seeks to consolidate commitment from key players to create synergies to contribute towards the conservation of this area of great socioeconomic and ecological value in the Central American region. For further information see: http://crdome.marviva.net/?lang=en

the utility of Regional Seas Agreement in advancing environmental protection and the use of 'umbrella' species to protect ecological communities.[309]

The 1999 Agreement provides for flag State enforcement and significantly for States Parties to enforce the sanctuary rules against the vessels of third States "within the limits established by the rules of international law."[310] Crucially, perhaps, the living resources are potentially within the scope of coastal States EEZs, which may explain the legal basis of this jurisdiction.[311] On the other hand, some shortcomings have arisen in relation to the Pelagos Sanctuary including concerns about the implementation of the management plan and the effectiveness of enforcement measures.[312] In order to address these defects, experts report advocates the establishment of regional and national databases, along with inventories of hot spots in coastal and marine areas;[313] as well as the incorporation of climate change and biodiversity strategies in national planning practices; the strengthening of ecosystem resilience (increasing MPAs connectivity; the adapting legislation on coastal land use to predictions of climate change impacts); reinforcement of legal and institutional frameworks; permanent monitoring systems.[314]

6.3.3.2 Cooperation and coordination framework

In light of the complex geopolitical nature of the Mediterranean Sea, the Barcelona Convention system provides a solid regional framework for cooperation and coordination. Notable features include setting down a general legal obligation on all Contracting Parties to participate in regional or sub-regional Agreements for the promotion of sustainable development and the protection of the environment in the Mediterranean Sea Area.[315] They are also required to encourage the implementation of the provisions of the Barcelona Convention and its Protocols by non-parties.[316] On a similar vein, Parties who are members of competent international organisations such as

[309] Norbartolo di Sciara, Hyrenbach, Agardy, above n 293, 100.
[310] Above n 292, article 14(2).
[311] Tanaka, above n 198, 352.
[312] Norbartolo di Sciara, Hyrenbach, Agardy, above n 293, 103.
[313] Scovazzi, above n 194, 40.
[314] A. Pavasovic, et. al., (2009) *Synthesis of national overviews on vulnerability and impacts of climate change on marine and coastal biological diversity in the Mediterranean region*. Tunis: UNEP-MAP RAC/SPA, 10.
[315] Barcelona Convention. Article 3 (2).
[316] Ibid. Article 3 (4).

the European Union are expected to promote within their regional structures the implementation of the principle of sustainable development, along with the adoption of conservation measures and rehabilitation programmes for the marine environment in the Mediterranean Sea.[317] The SPA/BD Protocol further advances the adoption of cooperative measures for the protection and conservation of endangered or threatened species,[318] as well as setting a clear standard that prohibits the destruction or damage to the habitat of threatened or endangered species.[319] In regard to this specific element, the CRD putative Agreement could replicate these provisions to ensure the protection of emblematic and endangered species associated with the Dome, such as the blue whale, the leatherback turtle, as well as different species of sharks and fish.[320]

In relation to fisheries management, it is worth highlighting the Memorandum of Understanding between the Regional Advisory Council for the Mediterranean and the General Fisheries Commission for the Mediterranean (GFCM).[321] This MoU provides a framework of cooperation and understanding to strengthen conservation actions for marine biodiversity. Within this framework of collaboration, the Parties agree to share information on the identification of areas of common interest and to undertake reciprocal communications and consultations about relevant topics through the development of a joint forum and the designation of focal points for coordination between both organisations.

Crucially, the UNEP Mediterranean Action Plan Secretariat to the Barcelona Convention and the FAO General Fisheries Commission for the Mediterranean have concluded an MoU that is aimed at enhancing regional ocean governance in the Mediterranean.[322] The MoU is notable in so far as both organisations enjoy strong mandates in their respective fields. Furthermore, the MoU reflects best practice as it provides a cooperative plinth for both organisations to pursue common objectives within the framework of their respective mandates to address ecosystem-based management, the mitigation of fisheries on marine habitats and species, the

[317] Ibid. Article 4 (6).
[318] SPA/BD Protocol. Article 12.1
[319] Ibid. Article 12.3
[320] Chapter 2, *ante*.
[321] Memoradum of Understanding between the Regional Advisory Council for the Mediterranean Sea (RAC/MED) and the Food and Agriculture Organisation of the United Nations on behalf of the General Fisheries Commission for the Mediterranean. Available at: http://en.med-ac.eu/files/events_other/148_cgpm_mou.pdf
[322] Ibid.

identification of and protection of biodiversity hotspots, integrated coastal zone management including maritime spatial planning, as well as legal institutional and policy cooperation.[323] In pursuing a similar approach to five mutual areas of cooperation, the strengthening of coordination and cooperation in the Central American region could entail the Inter-American Tropical Tuna Commission agreeing a MoU with a designated institutional body in a putative Agreement for the CRD.

6.3.3.3 Improvement of knowledge, monitoring and reporting

The Barcelona Convention calls for greater cooperation between Parties and international bodies on the monitoring of pollution,[324] as well as for the designation of competent authorities to monitor pollution in marine areas under and beyond the jurisdiction of the Parties.[325] In connection with protected areas, the SPA/BD Protocol requires the continuous monitoring of ecological processes, habitats, population dynamics, landscapes, as well as the impact of human activities.[326] Likewise, the promotion of research, access to and transfer of environmentally sound technology, and the provision of technical assistance in fields relating to marine pollution, are some examples of scientific and technological cooperation addressed by the Barcelona Convention.[327] Meanwhile, the SPA/BD Protocol calls Parties to promote training of managers and qualified technical personnel, as well as the development of appropriate infrastructure.[328] In addition, Parties must encourage and develop scientific and technical research in relation to the management and sustainable use of specially protected areas and the management of protected species.[329] Mutual cooperation,[330] mutual assistance[331] and reporting[332] from the Parties are key elements tackled in the

[323] UNEP/EC (2015) 'Cooperation between UNEP MAP-Barcelona Convention and FAO-GFCM,' *Workshop on regional ocean governance*. Belgium, 9–10 November.
[324] Barcelona Convention. Article 12
[325] Ibid. Article 12.2
[326] SPA/BD Protocol. Article 7.2 (b)
[327] Barcelona Convention. Article 13
[328] SPA/BD Protocol. Article 7.2 (f)
[329] Ibid. Article 20
[330] Ibid. Article 21
[331] Ibid. Article 22. For example, mutual assistance on programmes shall include public environmental education, training of scientific, technical and management personnel, scientific research, the acquisition, utilization, design and development of appropriate equipment, and transfer of technology.
[332] Ibid. Article 23

SPA/BD Protocol too. Such actions could also be included in a future conservation regime for the CRD.

6.3.4 Appraisal of the Barcelona system

Despite its maritime jurisdictional peculiarities from a Law of the Sea perspective, knowledge of the regional approach to ocean governance and the protection of biodiversity in the Mediterranean Sea can illuminate what treaty framework and institutional arrangements may work elsewhere including in the CRD. Accordingly, the matters considered in this section can be summarised in three points.

First, there has been a paradigm shift in the Mediterranean from a framework aimed at preventing and reducing marine pollution to taking of a more proactive approach to the protection of marine life and biodiversity more generally. States Parties to the Barcelona Convention have played a pioneering role in the development of cooperative arrangements and the achievement of shared conservation goals for the Mediterranean Sea, including the obligations placed on Parties, both individually and collectively, to conserve and protect marine biodiversity. Regional differences between EU Member States and other Contracting Parties to the Convention have not proved to be insurmountable. In this regard, remarkable instruments have been developed under the Barcelona systems including the SPA/BD Protocol, which provides for the establishment of trans-boundary protected areas and high seas MPAs. In adopting these measures, there is recognition that marine issues are inter-related, go well beyond vessels source pollution and need to be addressed in a coherent manner at a regional seas level. In this sense the Barcelona system has followed an evolutionary approach to the development and articulation of international legal obligations, similar to the one adopted in the North-East Atlantic by OSPAR.

Secondly and following on from the previous point, there is a pressing need for complementary governance approaches, namely global and regional frameworks to ensure the conservation of biodiversity in ABNJ. In this regard, there appears to be clear links between the Barcelona Convention and the BBNJ negotiation process at the United Nations, in so far as the former codifies the precautionary principle, the polluters pay principle and the ecosystem approach. In addition, the Convention calls for further actions on capacity building and technology transfer including elements like

training programmes, management tools, along with the establishment of a clearing-house mechanism. As seen, the Convention requires States Parties to undertake EIAs for activities that are likely to cause a significant adverse impact on the marine environment and provides a legal basis for liability and compensation mechanisms. Thus demonstrating that a global legally-binding instrument on the conservation and sustainable use of biodiversity in ABNJ and regional approaches go hand-in-hand.[333]

Thirdly, the protection of biodiversity in the Mediterranean Sea continues to face many challenges. In particular, questions have been raised about the effectiveness of the conservation measures and the MPA network in the Mediterranean Sea was deemed to be neither coherent nor representative in 2012.[334] There have been a number of important developments to strengthen the structures for the integrated management of a human activities that impinge upon the marine environment including most notably the conclusion of an MoU between UNEP/Map and the FAO on the part of the GCFM in relation to the to conservation of the marine environment and ecosystems, as well as the sustainable use of marine living resources, in the Mediterranean is an important milestone in the development of integrated and collaborative management structures. Similarly, a positive development and a major milestone in regional arrangements is the agreement on the IMAP in so far as it will provide a scientific basis for an assessment of the environmental status of the Mediterranean Sea. Much will be revealed on the effectiveness of the conservation approach and implementation of the ecosystem approach as soon as the first Quality Status Report is published in 2017. In the interim, the central thrust of the policy is proactive with the Pelagos Sanctuary operating as a tri-national MPA that aims to protect endangered and vulnerable species in areas both within and beyond national jurisdiction. The presence of endangered species and the lack of an appropriate legal framework to ensure their conservation are clear signs that action is necessary to protect the Dome. Additionally, similar efforts to engage civil society will certainly help establish an effective conservation regime for the CRD.

6.4 CONCLUSIONS

[333] Unger, above n 190.
[334] Gabrié, above n 246.

Regional seas arrangements tend to be heterogeneous and the OSPAR Convention and five Annexes represent the gold standard benchmark in management and governance arrangements, having evolved initially from a prevention of pollution scheme to a more comprehensive framework addressing biodiversity conservation measures. This is greatly facilitated by the its unique membership with the vast majority of State Parties that are also EU Member States. There is a strong scientific monitoring and assessment approach to the work of OSPAR, in the form of the Quality Status Report, that informs and permeates OSPAR's decision-making processes. As seen above, much of heavy lifting is undertaken by the six committees and much of their work is cutting-edge in relation to design and implementation of ABMTs.

In contrast, the Barcelona Convention framework encompasses EU and non-EU Members. This regime has been developed to govern a semi-enclosed sea with geographic and biodiversity distinctive features. Additionally, it must be highlighted that this case study has strong features of land-based pollution and compliance mechanisms as well-developed arrangements with other regional organisations.

Both the OSPAR and the Barcelona Conventions prove the hypothesis in chapter 1 is correct and that regional-cooperative arrangements between neighboring States are the most suitable means to protect biodiversity in ABNJ.

CHAPTER 7. EVOLVING REGIONAL APPROACHES TO BIODIVERSITY IN ABNJ OF THE ANTARCTIC, SARGASSO SEA AND THE SOUTH-EAST PACIFIC

7.1 INTRODUCTION

Similar to chapter 6, the aim of this chapter is to examine three regional approaches to the conservation and sustainable use of biodiversity in ABNJ, namely: the Antarctic Treaty System, the Sargasso Sea Commission and the Permanent Commission for the South Pacific. The three examples are very different and reflect the heterogeneous nature of ocean governance arrangements under international law. Moreover, they all reflect in one form or another the requirements of UNCLOS pertaining to regional cooperative arrangements between neighbouring countries. One of the common denominators is that all three regional arrangements are very much focused on addressing degrading environmental conditions in ABNJ. Significantly, they are not part of UNEP's Regional Seas Programme and have many significant features that merit closer examination for the purpose of this thesis. Notably, CCAMLR exercises legal competence in relation to the conservation of biodiversity and the application of the ecosystem approach, as well as in the management of fisheries. The Sargasso Sea is the subject of a unique initiative that shares many common features with the putative regime under review in chapter 9 for the CRD. The CPPS is clearly germane to this study as it is actively promoting a twinning arrangement with the UNEP Antigua Convention, discussed above in chapter 5, with a view to advancing sound environmental protection and management. The methodology followed in this chapter is similar to the one adopted in chapter 6, which is to appraise each regional regime through the lens of specific research questions, as will be seen further on below. As will be seen, they all entail the adoption of measures to protect and preserve the marine environment underpinned by the rule of law.

7.2 THE ANTARCTIC TREATY SYSTEM: BEST PRACTICE IN THE LAST CONTINENT

As indicated in previous chapters, regional approaches advancing specific rules to protect marine biodiversity are crucial in progressing good ocean governance at a

global level. The third case study examined in this context is the Antarctic Treaty System (ATS, hereinafter) and the Convention for the Conservation of Antarctic Marine Living resources (CCAMLR, hereinafter). These key regional instruments form a constructive framework for the protection and sustainable use of marine resources in the maritime area covered by the Antarctic Treaty (AT) and the CCAMLR Convention, which constitute predominantly ABNJ.[1]

Following a similar format to the one adopted in the two previous case studies, this section starts with a brief legal overview focusing on the protection of biodiversity achieved by the ATS and CCAMLR frameworks, followed by the progression of these regional examples in relation to the elements that are under negotiation for inclusion in the new BBNJ Agreement. To this end, it identifies and addresses several lessons that can be replicated in the context of designing new arrangements applicable to the Costa Rica Dome. In undertaking this analysis, the chapter pays special attention to the application of ABMTs, strategic and project environmental assessment, the application of the ecosystem approach, along with regional approaches to genetic resources, dispute settlement, the contentious issue of environmental liability, as well as the arrangements that are in place to engender cooperation between other international bodies. As a point of departure for the discussion below it should be noted that the First World Ocean Assessment notes that unsustainable fishing, by-catch, habitat loss, invasive species, human disturbance, pollution and the effects of climate change, all pose severe threats for biodiversity in the Southern Ocean.[2]

7.2.1 Towards the protection of marine biodiversity in the Antarctic Treaty System

The first agreement addressed in this section is the Antarctic Treaty,[3] which provides a legal cornerstone and the over-arching framework for the use of Antarctica for peaceful

[1] D. Vousden, 'Large marine ecosystems and associated new approaches to regional, transboundary and high seas management' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing. 2015), 279.
[2] United Nations Division for Ocean Affairs and the Law of the Sea (ed.) (2017) *The First Global Integrated Marine Assessment: World Ocean Assessment I. Chapter 36. The Southern Ocean*. Cambridge: Cambridge University Press.
[3] 1959 Antarctic Treaty. 402 UNTS 71. Entered into force on 23 June 1961. States Parties to the Antarctic Treaty entitled to participate in the Consultative Meeting are the following: Argentina, Australia, Belgium, Brazil, Bulgaria, Chile, China, Czech Republic, Ecuador, Finland, France, Germany, India, Italy, Japan, Republic of Korea, Netherlands, New Zealand, Norway, Peru,

purposes, international scientific cooperation, and the continuance of international harmony in relation to human uses of this area.[4] In line with its fundamental principles, Antarctica has been designated as a natural reserve,[5] devoted to peace and science,[6] requiring comprehensive protection in accordance with the commitment of State Parties.[7]

Most significantly, in regards to jurisdictional claims, the treaty specifies that no acts or activities constitute a basis for supporting or denying a claim to territorial sovereignty in Antarctica.[8] Yet, a number of States had previously made territorial claims in Antarctica, but the AT freezes such claims.[9] Relevant to the present analysis, the geographical scope of the Antarctic Treaty encompasses marine areas beyond the national jurisdiction of the Contracting Parties, and significantly, the Treaty does not affect the rights of any State under international law with regard to the high seas within that area.[10]

In organisational matters, the Antarctic Treaty has an institutional structure shaped by a Consultative meeting,[11] a Committee for Environmental Protection,[12] and the participation of observers designated by Parties.[13] Apart from having a solid institutional mechanism, the Antarctic Treaty also has a strong regulatory scheme, and given the unique opportunities that Antarctica offers for scientific monitoring, research and the development of a comprehensive protection regime for this environment,[14] the treaty is

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Poland, Russian Federation, South Africa, Spain, Sweden, Ukraine, United Kingdom, United States, Uruguay. The Parties to the Antarctic Treaty which are not part of the Consultative Meeting are: Austria, Belarus, Canada, Colombia, Cuba, Denmark, Estonia, Greece, Guatemala, Hungary, Iceland, Kazakhstan, Korea (DPRK), Malaysia, Monaco, Mongolia, Pakistan, Papua New Guinea, Portugal, Romania, Slovak Republic, Switzerland, Turkey, Venezuela.

[4] Antarctic Treaty. Recital 2, 4.

[5] The Scientific Committee of CCAMLR has advice to consider the Convention's area equivalent to an IUCN Category IV MPA, but specific areas should be specially considered for further protection. CCAMLR Conservation Measure 91-04 (2011). Recital 10.

[6] Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol). 30 ILM 1455. Entered into force 14 January 1998. Article 2.

[7] Ibid. Recital 1.

[8] Antarctic Treaty. Article 4.1. See also: P. Vigni, 'Antarctic Maritime Claims: Frozen Sovereignty and the Law of the Sea' in A. Oude Elferink, E. Rothwell (eds.), *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction* (Martinus Nijoff: The Hague, 2001) 85, 104.

[9] CCAMLR Convention. Article IV.

[10] Antarctic Treaty. Article 6.

[11] Madrid Protocol. Article 10.

[12] Ibid. Article 11, 12.

[13] Ibid. Article 14.

[14] Ibid. Recital 5, 7.

complemented by the Protocol on environmental protection, also known as the Madrid Protocol.[15] The Annexes of the Madrid Protocol are an integral part of it,[16] and further details on its regulations will be addressed in the following paragraphs.

The Madrid Protocol contains provisions on environmental principles, including planned and conducted activities to avoid adverse effects on climate or environmental quality in the terrestrial, glacial or marine habitats; or detrimental changes in the distribution and abundance of species.[17] Other significant elements addressed in the Protocol are the conduct of prior assessments of impacts of activities on the Antarctic environment, [18] as well as the general prohibition of activities relating to mineral resources.[19] As indicated previously, the Madrid Protocol is supplemented by several Annexes including Annex I: environmental impact assessment; Annex II: conservation of Antarctic fauna and flora; Annex III: waste disposal and waste management; Annex IV: prevention of marine pollution; Annex V: area protection and management; Annex VI: liability arising from environmental emergencies.

For the purpose of this study, some of these Annexes are reviewed in further detail below including Annex I on Environmental Impact Assessment, which is discussed in the context of the BBNJ negotiation process. Of particular importance is Annex II on Conservation of Antarctic fauna and flora, which is a valuable example of best practice and can thus inform the development of a management scheme for the CRD. With the objective to ensure that only the strictly necessary specimens are removed from the Convention Area,[20] this Annex sets a provision on the prohibition of taking[21] or to harmfully interfere[22] with biodiversity. A permit[23] to take specimens is issued only in strict circumstances, such as the provision of specimens for scientific study, museums, botanical gardens or other educational institutions. [24] Permits are granted if a

[15] Ibid. Article 4.
[16] Ibid. Article 9.
[17] Ibid. Article 3 (b).
[18] Ibid. Article 3 (c), (d).
[19] Ibid. Article 7.
[20] Ibid. Annex II. Article 3.
[21] Ibid. Annex II. Article 1 (g).
[22] Ibid. Annex II. Article 1 (h). Some examples of harmful interference are the use aircrafts, vehicles or vessels disturbing concentrations of birds or seals; using explosives or firearms; significantly damaging native plants; any activity that results in the significant adverse modification of habitats of any species.
[23] Ibid. Annex II. Article 3.
[24] Ibid. Annex II. Article 3 (2).

compelling scientific purpose is demonstrated, and that it will not jeopardise the survival or recovery of that species.[25] In a similar way as other international environmental instruments, the Annex also refers to a list of specially protected species. The prohibition on the introduction of non-native species[26] and the provisions on the exchange of information[27] are elements also addressed in the Annex. Finally, the Annex does not apply in case of an emergency to safeguard human life, highly valued equipment and facilities or the protection of the environment.[28] Another example of how this particular regional agreement advances the conservation and sustainable use of biodiversity in ABNJ is the manner in which it provides for the application of area-based management tools.

More specifically, Annex V develops area protection and management in Antarctica, and sets down a regulatory framework for the spatial management of protected areas. In particular, it provides for the establishment of the Antarctic Specially Protected Areas (hereafter, ASPA) and the Antarctic Specially Managed Areas (hereafter, ASMA), where particular activities are prohibited or specifically managed in accordance with Management Plans.[29] Given that both designations could inspire the application of similar tools in a new management scheme for the CRD, they will be addressed in further detail below.

The Antarctic Specially Protected Areas and Sites of Special Scientific Interest are established to protect outstanding environmental, scientific, historic, aesthetic or wilderness values,[30] and Annex V identifies the criteria to guide the establishment of these areas. For example, if an area is to be designated as an ASPA, it should meet criteria such as constituting a representative example of a marine ecosystem with important or unusual assemblages of species, including major colonies of breeding species, or areas of outstanding aesthetic and wilderness value.[31] Most notably, *prima*

[25] Ibid. Annex II. Article 3 (4). The designation of a species as a Specially Protected Species shall be undertaken according to agreed procedures and criteria adopted by the Antarctic Treaty Consultative Meeting. Currently, the list of Specially Protected Species in Appendix A has only included the Ross seal.
[26] Ibid. Annex II. Article 4.
[27] Ibid. Annex II. Article 6. Exchange of information includes statistics and status of native species.
[28] Ibid. Annex II. Article 2.
[29] Ibid. Annex V. Article 2.
[30] Ibid. Annex V. Article 3.
[31] Ibid. Annex V. Article 3 (2).

facie, entry into these areas is prohibited unless Parties have a specific permit to undertake a specified activity.[32]

Another feature created under Annex V is the Antarctic Specially Managed Areas, which may include areas where activities pose risks or cumulative environmental impacts on sites or monuments of recognized historic value.[33] The possibility to enter these areas without requiring a permit is one major difference from the Specially Protected Areas designations described above, [34] and which may have major consequences on practical matters for Contracting Parties. In addition, Antarctic Specially Managed Areas[35] may contain one or more Antarctic Specially Protected Areas, entry into which is prohibited except in accordance with the terms and conditions set out in the required permit. [36]

It must be noted that the establishment of a management plan is essential for both designations.[37] In this regard, any Party, the Scientific Committee for Antarctic Research or the CCAMLR Commission may propose the designation of either type of area by submitting a Management Plan to the Antarctic Treaty Consultative Meeting.[38] The management plan has to include specific elements such as the description of the conservation values to be protected and managed, objectives, management activities, description of the area, identification of zones within activities are to be prohibited, restricted or managed, maps, and permissions, among other matters. [39] In such instances, the Management Plan proposal must be analysed by the Committee for Environmental Protection, the Scientific Committee on Antarctic Research and the CCAMLR Commission. Subsequently, Parties in the Antarctic Treaty Consultative

[32] Ibid. Annex V. Article 3 (3), (4). See also: Guidelines for Implementation of the Framework for Protected Areas set forth in Article 3, Annex V of the Environmental Protocol. Resolution I (2000) Annex.
[33] Ibid. Annex V. Article 4.
[34] Ibid. Annex V. Article 4 (3).
[35] In respect to an area proposed to be designated as an Antarctic Specially Protected Area, a clear description is required on the conditions under which permits may be granted (Madrid Protocol. Annex V. Article 5 (3.i); and if an Antarctic Specially Managed Area is going to be designated, it is necessary to establish a code of conduct that is applicable to such area (Madrid Protocol. Annex V. Article 5 (3.j). See also: Antarctic Treaty System. *Guidelines for implementation of the framework for protected areas set forth in Article 3, Annex V of the Environmental Protocol*. Available at: https://www.ats.aq/documents/recatt/Att081_e.pdf
[36] Ibid. Annex V. Article 4 (4).
[37] Ibid. Annex V. Article 5. See also: Guidelines, above n 35.
[38] Ibid. Annex V. Article 5 (1).
[39] Ibid. Annex V. Article 5 (3).

Meeting discuss the approval of the Plan.[40] Significantly, the designation of an Antarctic Specially Protected Area or an Antarctic Specially Managed Area is for an indefinite period[41] and has to have the prior approval of CCAMLR, which also undertakes additional coordination with the various bodies with a management role in Antarctica.[42] Finally, it ought to be noted that Contracting Parties are obliged to appoint an authority to issue permits to enter and engage in activities in accordance with the scheme set down in the Management Plan.[43]

As noted above, and in a similar trend to other regional frameworks regarding the creation of lists including relevant sites or habitats, the designated Antarctic Specially Protected Areas, Antarctic Specially Managed Areas or other relevant areas must be included in a Historic Sites and Monuments list, which must not be damaged, removed or destroyed.[44] Also in correlation to the above-mentioned Annexes, in the case of an emergency, the restrictions set out in Annex V would not apply.[45]

Finally, the Madrid Protocol of the Antarctic Treaty provides for an emergency response action,[46] where Parties agree to provide prompt and effective response action to emergencies in the performance of scientific research programmes, tourism and other related activities,[47] as well as cooperating with contingency plans in response to incidents.[48] This kind of arrangement would be of relevance to replicate in a putative scheme for the CRD, where multiple economic activities occur and could pose risk to the marine environment and its associated biodiversity.

7.2.2 Striving for the sustainable use of ocean resources in Antarctica: The Convention on the Conservation of Antarctic Marine Living Resources

[40] Ibid. Annex V. Article 6.
[41] Ibid. Annex V. Article 6 (3).
[42] Ibid. Annex V. Article 6 (2).
[43] Ibid. Annex V. Article 7.
[44] Ibid. Annex V. Article 8 (1), (4).
[45] Ibid. Annex V. Article 11.
[46] Ibid. Article 15.
[47] Ibid. Article 15 (a).
[48] Ibid. Article 15 (b).

The second regional framework to be addressed in this section is the Convention on the Conservation of Antarctic Marine Living Resources[49] (CCAMLR, hereafter), which provides a legal basis for the establishment and functioning of a regional organisation concerning the conservation and management of marine resources in Antarctica. The CAMLR Convention emerged from a historic circumstance of an over-exploited Southern Ocean due to unsustainable fisheries.[50] In response to this situation, the Antarctic Treaty Consultative Meeting Recommendation IX-2[51] called on its Contracting Parties to set up a conservation and management regime for the marine resources, which was the first step towards the establishment of CCAMLR.[52] Subsequently, conscious of the urgency to take action and ensure the conservation of Antarctic living resources[53] the 12 Contracting Parties adopted CCAMLR.

The objectives and framework advanced by CCAMLR are sophisticated and comprehensive in scope. Thus, for instance, in the same way as the Antarctic Treaty, CCAMLR highlights the interests of all mankind to preserve the waters surrounding the Antarctic continent for peaceful purposes.[54] The geographical scope of this Convention applies to the Antarctic marine living resources of the area south of 60° South latitude and between that latitude and the Antarctic Convergence current.[55] Also relevant is that, both the Antarctic Treaty and the CCAMLR Convention specify that they will not affect the rights or claims of any State under international law with regard to sovereignty matters in the Antarctic area.[56] CCAMLR has wide material scope in so far as it aims to conserve Antarctic marine living resources, including finfish, molluscs, crustaceans, birds and all other species of living organisms.[57] It explicitly indicates that conservation extends to rational use, including harvesting and associated activities, which must follow principles of conservation like the prevention of decreased harvested populations, maintenance of ecological relationships and the prevention of

[49] Convention on the Conservation of Antarctic Marine Living Resources. UNTS 1329. Entered into force on 7 April 1982. States Parties to CCAMLR are the following: Argentina, Australia, Belgium, Brazil, Chile, China, European Union, France, Germany, India, Italy, Japan, Republic of Korea, Namibia, New Zealand, Norway, Poland, Russian Federation, South Africa, Spain, Sweden, Ukraine, United Kingdom, United States of America, Uruguay.
[50] CCAMLR Commission. *History*. Available at: http://www.ccamlr.org/en/organisation/history
[51] Antarctic Treaty. Recommendation IX-2. London, 1977.
[52] Ibid. Para. 3.
[53] CCAMLR Convention. Recital 3.
[54] Ibid. Recital 9.
[55] Ibid. Article 1.
[56] Ibid. Article 4.
[57] Ibid. Article 2.

changes in the marine ecosystem.[58] However, CCAMLR excludes some species, like whales[59] and seals, given that these vulnerable species are protected and managed in other specific Treaties, such as the International Convention for the Regulation of Whaling discussed previously in chapter 3, and the Convention for the Conservation of Antarctic seals.[60]

On institutional arrangements, the CCAMLR Commission undertakes specific functions such as: facilitating and compiling data on the status of species and factors affecting the distribution, abundance and productivity of harvested or related species; ensuring the acquisition of catch and effort statistics on harvested populations; identifying conservation needs; implementing a system of observation and inspection; formulating, adopting and revising conservation measures on the basis of the best scientific evidence available.[61] The latter allows the Commission to designate the quantity of harvested species; the designation of protected species; the designation of open and closed harvesting seasons; the regulation of the efforts employed and methods of harvesting; [62] among other measures, which are binding after a notification period to Member States.[63] This prerogative of the Commission to adopt specific conservation measures could be a useful element to be replicated and included in the CRD management scheme in due course, as will be seen in chapter 9. In practice, a notable feature is that each Contracting Party of the Convention, as well as regional economic integration organisations, can participate in the work of the CCAMLR Commission.[64] Important to acknowledge in this context is that decisions on substantive matters are taken by consensus and this approach has produced a harmonious approach to the adoption of conservation and management measures.[65] On the other hand, there is a danger that it undermines an expeditious and effective response to contentious issues.

Another element in the CCAMLR institutional structure is the Scientific Committee, a consultative body to the Commission, [66] which must take full account of its

[58] Ibid.
[59] Also see discussion of *Whaling in the Antarctic (Australia* v. *Japan: New Zealand intervening), Judgment, I.C.J. Reports 2014*.
[60] CCAMLR. Article 6.
[61] Ibid. Article 9.
[62] Ibid. Article 9(2).
[63] Ibid. Article 9(6).
[64] Ibid. Article 7.
[65] Ibid. Article 12.
[66] Ibid. Article 14.

recommendations and advice.[67] The work of the Committee is supported and undertaken by scientific and technical representatives of the Parties.[68] In this regard, it is a relatively open body that strives to be a forum for consultation and cooperation for study and exchange of information on the Antarctic marine living resources.[69] Some of its functions are the establishment of criteria and methods underpinning conservation measures; assessing the status of the populations of marine resources; evaluating the impacts of harvesting on marine resources; presenting reports and recommendations to the Commission; among many other matters.[70]

In the overall analysis, it is important to note that both the CCAMLR Convention and the Antarctic Treaty are separate international Agreements, but that are closely inter-related and aligned at a regional level. This feature adds value to both as complementary regulatory frameworks with specific policy objectives. Moreover, the relationship between the CCAMLR Convention, the Antarctic Treaty and the Madrid Protocol are key features of coordination and cooperation within the Southern Ocean region.[71] Significantly, this close correlation is also evident in three articles in CCAMLR which refer directly to the Antarctic Treaty, namely: a) article 3 which establishes that Contracting Parties, whether or not they are Parties to the Antarctic Treaty, agree that they will not engage in activities that are contrary to that Treaty; b) article 4.1 of CCAMLR binds its Contracting Parties to Articles 4 and 6 of the Antarctic Treaty, with regard to Antarctic territorial claims; c) article 5 and 10 provides that Contracting Parties which are not Parties to the Antarctic Treaty acknowledge the special conservation measures, obligations and responsibilities of the Antarctic Treaty Consultative Parties.

7.2.3 The Antarctic Treaty System and the protection of marine treasures in ABNJ

In addressing the advancements of regional agreements on the conservation and sustainable use of biodiversity in ABNJ, the next paragraphs highlight improvements achieved within the Antarctic System. As mentioned previously, CCAMLR recognises

[67] Ibid. Article 9(4).
[68] Ibid. Article 14.
[69] Ibid. Article 15.
[70] Ibid. Article 15(2).
[71] Ibid. Article 10.

that conservation embraces the sustainable use of marine resources.[72] With this in mind, article 9 of the Convention provides for a range of conservation measures and tools. These measures are published in the so-called Annual Schedule of Conservation Measures in Force.[73] Following this approach, a number of relevant conservation measures could guide the design of a regulatory framework for the CRD, and the most relevant will be addressed in the following paragraphs.

Firstly, the restriction of fishing gears in CCAMLR maritime areas has been included in different conservation measures.[74] For example, the use of bottom trawling gear in the high seas is restricted to areas under specific conservation measures,[75] and various prohibitions such as the use of gillnets;[76] the use of plastic packaging on fishing vessels, the discharge of oil or fuel products into the sea, garbage, incinerator ash, among other pollutants,[77] and the prohibition of directed fishing on shark species[78] are additional examples of general environmental protection measures during fishing activities.

Another important tool used by CCAMLR in the protection of the marine environment and its biodiversity has been the creation of MPAs. In this regard, the establishment of a network of MPAs is essential to ensure the protection and preservation of the Antarctic unique ecosystem and the species it supports. In a similar sense to other regional case studies, the CCAMLR Commission has the goal to develop a representative and comprehensive network of MPAs that covers pelagic regions, rare features, VMEs and other biological features.[79] This process starts with the identification of candidate for MPAs and the submission of proposals to the CCAMLR Scientific Committee. MPAs within the CCAMLR framework aim to contribute to the achievement of particular conservation objectives, such as the protection of representative examples of marine

[72] Ibid. Article 2.
[73] Ibid. Article 9(3). In practice, the Commission publishes the measure to be adopted and once this notification has been made, the measure becomes binding 180 days later. Members may reject the measure within 90 days of publication provided that they have adequate reasons justifying their decision, which must also be notified to the Commission. See also Article 9(6).
[74] Ibid. Article 11. To harmonize conservation and management measures the CCAMLR Commission works in respect of stocks or associated species with Contracting Parties with jurisdiction in marine areas adjacent to the Convention's area.
[75] Conservation Measure 22-05 (2008).
[76] Conservation Measure 22-04 (2010).
[77] Conservation Measure 26-01 (2015).
[78] Conservation Measure 32-18 (2006).
[79] L. Douglass, D. Beaver, J. Turner, R. Nicoll (2016) *An identification of areas within the high seas of the Southern Ocean that would contribute to a representative system of MPAs*. Australia: CCAMLR. (WS-MPA-11/16).

ecosystems to maintain their viability; the protection of key ecosystem processes and species; the establishment of scientific reference areas for monitoring natural variability and long-term change in Antarctica; and the protection of areas vulnerable to impact by human activities, among others.[80] As part of its brief, the CCAMLR Scientific Committee is tasked with providing advice on identifying a coherent and representative network of MPAs in the Southern Ocean.[81] Consequently, the establishment of MPAs is a process led by the best available scientific evidence as asserted under the guidance of the Scientific Committee. In this sense, if an MPA is to be created, it must detail specific objectives; spatial boundaries; restricted, prohibited, or managed activities in the MPA, as well as temporal or spatial limits on those activities; priority elements for a management plan, including administrative arrangements, as well as research and monitoring plans.[82] These ambitious requirements are valuable guidelines that could be included in a putative management scheme for the CRD.

In regards to coordination, when a new MPA in CCAMLR is designated, the CCAMLR Commission has to communicate pertinent information to the Antarctic Treaty Consultative Meeting, and encourage the Antarctic Treaty Consultative Meeting to take appropriate actions within its competence to contribute to the achievement of the specific objectives that are within its purview.[83] Additionally, information on the MPAs conservation measures is made available to relevant international or regional organisations, as well as to non-Parties whose nationals or vessels enter the Convention Area.[84]

It is interesting to note that the MPA conservation measures have a temporal element, given that they are reviewed every 10 years or as agreed by the CCAMLR Commission, with the view to evaluate the accomplishment of the specific objectives of the MPA, as well as the delivery of the research and monitoring plans.[85] In regards to compliance, the primacy of the responsibility of the Flag State is complemented by the cooperation of Contracting Parties with appropriate measures to ensure the achievement of conservation measures, including seeking reciprocal and cooperative arrangements for

[80] CCAMLR, above n 5, para. 2.
[81] CCAMLR Scientific Committee (2008) *Report of the 27th meeting of the Scientific Committee*. Hobart: CCAMLR.
[82] CCAMLR. Conservation Measure 91-04 (2011). Para. 3, 5.
[83] CCAMLR. Conservation Measure 91-05 (2016). Para. 26.
[84] CCAMLR, above n 82, para. 9.
[85] Ibid. Para. 8.

the exchange of information.[86] Vessels under the jurisdiction of CCAMLR Contracting Parties, either fishing vessels or those conducting scientific research, are subject to CCAMLR conservation measures applicable to MPAs.[87]

How successful is this approach? Indicatively, a report by the CCAMLR Performance Review Panel[88] highlighted the need for further CCAMLR progress on MPAs and called for the proposal of marine areas as either ASPAs or ASMAs by CCAMLR, as well as using CCAMLR for the closure of specific areas for conservation purposes.[89] The approach has a number of positive features. Specifically, in relation to the Antarctic Treaty´s provisions improving the conservation and sustainable use of marine biodiversity in ABNJ, this regional framework has developed area-based management tools with a view to advancing to a harmonised approach in spatial protection. As mentioned before, since CCAMLR and ATS have coordination mandates with each other, and particularly in ABMTs, there is a possibility to have ASPAs and ASMAs designated by the Antarctic Treaty Consultative Meeting within CCAMLR MPAs, which would allow for detailed consideration of activities not normally considered by CCAMLR,[90] enhancing a broader protection for the marine ecosystem in such areas.

7.2.3.1 The need for a regional approach to climate change mitigation and adaptation

The Antarctic region is exposed to the impacts of climate change and ocean acidification. More precisely, the IPCC Fifth Assessment Report indicated that the "Antarctic bottom water has warmed since the 1980s or 1990s, most noticeably near Antarctica."[91] In this context, CCAMLR Resolution 30/XXVIII reiterated the need to protect the integrity of marine ecosystems in the seas surrounding Antarctica in the face of climate change effects.[92] In addition, the CCAMLR Commission has previously

[86] CCAMLR. Conservation Measure 10-08 (2009).
[87] CCAMLR, above n 82, para. 6.
[88] CCAMLR Review Panel (2008) *CCAMLR performance Report*. Australia: CCAMLR.
[89] CCAMLR Convention. Article 9(2)(g).
[90] CCAMLR. Conservation Measure 91-02 (2012).
[91] M. Rhein, et. al. (2013) 'Observations: Ocean,' in: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. United Kingdom/USA: Cambridge University Press, 49.
[92] CCAMLR Resolution 30/XXVIII (2009).

endorsed the work of the Scientific Committee in relation to CCAMLR management decisions about the impacts of climate change.[93]

Due to climate change impacts, scientists have argued that marine resources management in the CCAMLR framework must be adaptive and proactive, for example, research needs to be intensified on lifecycle processes of Antarctic krill, under-ice and benthic habitat uses, species capacity to adapt to environmental changes, and modifications in ecosystem functions, among others.[94] This particular point is of interest to the CRD, given that the potential shift in the distribution of species and their capacity to adapt to a changing marine environment could occur in the near future in the Dome.

As CCAMLR is part of the Antarctic Treaty System, it has the benefit of advice from the Scientific Committee on Antarctic Research (SCAR), which provides independent scientific advice to the Antarctic Treaty Consultative Meetings, and publishes the Antarctic Climate Change and the Environment Report, which is annually updated on specific elements.[95] For example in relation to changes in the Antarctic physical environment, the 2016 Report recognized temperature and precipitation changes,[96] expected retreat of the ice shelves,[97] as well as retreatment of coastal glaciers at unprecedented speed.[98] Consequently, it is estimated that Antarctica has the potential to contribute more than a metre of sea-level rise by 2100.[99] In relation to changes in the Antarctic biological environment, the rapid warming in the highly productive regions has affected multiple trophic levels.[100] In addition, the CCAMLR Scientific Committee has growing evidence indicating that the increased CO2 levels may have serious impacts upon stocks of krill, which are the basis of the Antarctic food chain.[101]

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[93] Antarctic and Southern Ocean Coalition (2014) *Incorporating climate change into CCAMLR's decision-making process*. Washington, DC: ASOC.
[94] European Union Delegation (2011) *Antarctic krill and climate change*. Netherlands: CCAMLR. (CCAMLR-XXX/BG/03).
[95] J. Turner, et. al. (2014) 'Antarctic climate change and the environment: An update,' 50 *Polar Record*, Vol. 50, 237.
[96] J. Turner, et. al. (2016) *Antarctic climate change and the environment 2016 update*. Chile: Antarctic Treaty Consultative Meeting.
[97] Ibid. Para. 5.
[98] Ibid. Para. 23.
[99] Ibid. Para. 6.
[100] Ibid. Para. 21.
[101] T. Stephens, 'Ocean acidification' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing. 2015), 446.

Another key phenomenon related to global warming is ocean acidification. The CCAMLR Commission has been giving growing consideration to this specific matter in the Southern Ocean, given that CCAMLR's overarching objective is the conservation of Antarctic marine living resources[102] including "fin fish, molluscs, crustaceans and all other species of living organisms."[103] This objective and the specific reference to shell-forming organisms are significant from the perspective of ocean acidification, given the particular susceptibility of molluscs and crustaceans to changing carbon chemistry.[104] Moreover, in the changing environmental conditions of Antarctica, the CCAMLR Commission would have to develop and improve longer-term studies of acidification for the entire lifecycle of important species.[105] Underpinning these issues, it is significant that CCAMLR Resolution 30/XXVIII called for additional management actions to help build resilience and protect the unique Southern Ocean environment against potentially irreversible impacts of climate change.[106]

Most recently, and in an effort to keep up with the challenges posed by climate change in Antarctica, CCAMLR has designated Special Areas for Scientific Study to newly exposed marine areas following the retreat or collapse of an ice shelf, glacier or ice tongue. The details on the conditions for scientific research and fishing activities within these special areas are specified in the conservation measure.[107]

Undoubtedly the impact of climate change is a major global issue. It is absolutely critical that CCAMLR maintains and improves the ecosystem-based management approach, as well as the precautionary principle, to adapt its conservation measures for new environmental conditions in Antarctica due to climate change.

7.2.4 Connections between the Antarctic system and a new agreement for the conservation of biodiversity in ABNJ

The following subsection explores how the Antarctic System regional agreements address the particular elements under discussion in the BBNJ negotiation process.

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[102] CCAMLR Convention. Article 2(1).
[103] Ibid. Article 1(2).
[104] Stephens, above n 101, 445.
[105] **European Union Delegation, above n 94.**
[106] CCAMLR Resolution 30/XXVIII (2009). Recital 6.
[107] CCAMLR. Conservation measure 24-04 (2016).

7.2.4.1 Broadening the spectrum of protection in Antarctica, the establishment of ABMTs including marine protected areas in ABNJ

As seen earlier, the Antarctic Treaty System has a relatively unique governance mechanism that allows for the creation of MPAs in the high seas and the development of a representative network of MPAs with the support and coordination of institutional bodies such as the Antarctic Treaty's Committee for Environmental Protection (CEP) and CCAMLR.[108] Although Contracting Parties to CCAMLR acknowledge the need for MPAs and have been very proactive in this regard,[109] they have to deal with the competing interests of fishing States regarding access restrictions to economically valuable fishing areas. The latter issue is increasingly difficult to reconcile in the context of the establishment of new marine protected areas in Antarctica and therefore remains contentious.[110] Nevertheless, there has been considerable progress in relation to conservation goals and currently two MPAs have been established in ABNJ within the Antarctic region, which will be addressed below.

In 2009 CCAMLR adopted its first MPA on the continental shelf of the South Orkney Islands, where dumping or discharge of wastes[111] by fishing vessels was prohibited, as well as the prohibition of all types of fishing activities, with the exception of scientific fishing research.[112] In addition, fishing vessels transiting this area are encouraged to inform the CCAMLR Secretariat of their intended transit prior to entering the MPA.[113]

The second, and most recent example of an MPA established in ABNJ by CCAMLR, is the Ross Sea MPA, which is a global and regional milestone in many respects. As seen above, CCAMLR has sought to pursue a leadership role internationally through its achievements in the conservation of Antarctic marine living resources and biodiversity.

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[108] CCAMLR Scientific Committee (2004) *Report of the 23th meeting of the Scientific Committee*. Hobart: CCAMLR. Para. 4(13). See also: Vousden, above n 1, 395.
[109] G. Wright, J. Rochette, E. Druel, 'Marine protected areas in areas beyond national jurisdiction,' in R. Rayfuse (ed.) *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing, 2015), 280.
[110] Ibid.
[111] CCAMLR. Conservation Measure 91-03 (2009). Para. 2.
[112] Ibid. Para. 3.
[113] Ibid. Para. 5.

The identification of the Ross Sea region as a priority area for the conservation of biodiversity due to its exceptional features of ecological value and scientific importance was an obvious example of a biodiversity hotspot that demanded further regulatory action pursuant to the CCAMLR framework.[114] However, it has to be acknowledged that the creation of the Ross Sea MPA was the result of a slow and complex process within the CCAMLR, which demonstrates the difficulties and challenges that regional frameworks have in relation to decision making processes by consensus, particularly when it comes to achieving an appropriate balance between competing environmental issues and fishing interests. Indeed, when one looks back at the history of the designation process, it is evident that it reached a number of impasses before further progress was made. Despite some initial progress and the 2009 Road Map commitments, at its 2012 meeting, the Commission failed to reach agreement on the designation of new MPAs. Believing agreement was close the Commission took the unusual step of calling for a special meeting to discuss the proposals further, only the second such meeting to have taken place in the history of the Commission. At the Special Meeting of the Commission held in July 2013, there was again no agreement. Indeed, some States began to question the entire MPA creation process, asserting that the CCAMLR may not have the legal authority required to designate MPAs. [115]

Despite the difficult and protracted political backdrop of the designation process, the creation of this MPA was aimed at contributing to specific objectives. These included the conservation of the natural ecological structure, dynamics and function throughout the Ross Sea, the protection of known rare or vulnerable benthic habitats,[116] and the protection of large-scale ecosystem processes responsible for the productivity and functional integrity of the ecosystem.[117] The last two conservation objectives could be replicated in a putative agreement for the CRD. Furthermore, the CCAMLR institutional framework supports the actions needed to accomplish the conservation goals in the Ross Sea MPA. For example, the CCAMLR Commission has the responsibility to promote the consistency of complementary initiatives or protection measures with

[114] CCAMLR, above n 83, recital 9.
[115] See: CCAMLR (2012) *Report of the 31st meeting of the Commission*. Hobart: CCAMLR. See also: Delegation of Ukraine (2013) 'On absence of legal ability to organize marine protected areas in the high seas of the World Ocean, including the Antarctic waters,' *Second special meeting of CCAMLR*. Germany, 31 May.
[116] CCAMLR, above n 83, para. 3
[117] Ibid. Annex 91-05/B. Para. 1 (v).

other organisations,[118] including as seen in the previous subsection, coordination with and among the different bodies within the Antarctic System. Additional responsibilities of the Scientific Committee, the Secretariat and Member States are detailed in the management plan applicable to the Ross Sea MPA.[119]

From a spatial management perspective, it is significant to note that the Ross Sea MPA is divided into three zones, designed to achieve specific protection and scientific objectives, namely: a) General Protection Zone, b) the Special Research Zone, and c) the Krill Research Zone.[120] Also, the management plan of this MPA addresses fisheries activities specifically.[121] In this regard, the CCAMLR Commission made a notable effort to keep the balance between protection and rational use of marine resources, and amended relevant conservation measures for the Ross Sea toothfish fishery, with a view to ensuring that fishing displaced by this MPA would be redistributed to areas outside the protected area.[122] The management plan also introduces some elements on research and monitoring plans that seek to be an open, transparent and standardised framework under which all Members interested collect, access and analyse data.[123] Again, this is a feature that could be incorporated in to a future CRD framework.

In relation to another type of ABMT within the CCAMLR maritime area, management measures have been addressed to protect vulnerable marine ecosystems, including: seamounts, hydrothermal vents, cold water corals and sponge fields. Furthermore, the implementation of the precautionary and ecosystem approaches to fisheries management has required the prevention of bottom fishing activities that have significant adverse impacts on VMEs. In this sense, Contracting Parties to CCAMLR are not allowed to authorise vessels flying their flag to participate in bottom fishing activities. [124]

[118] Ibid. Para. 3.
[119] Ibid. Para. 3, 4, 5, 6.
[120] Ibid. Para. 5.
[121] Ibid. Para. 2.
[122] Ibid. Recital 15.
[123] Ibid. Annex 91-05/C. Para. 2.
[124] CCAMLR. Conservation Measure 22-06 (2015). See also: CCAMLR. Conservation Measure 22-09 (2012).

7.2.4.2 Foreseeing impacts on the marine environment: Environmental impact assessment (EIA) and Strategic environmental assessment (SEA) in ABNJ

There is considerable economic development activity undertaken in the CCAMLR and the Antarctic Treaty areas. Therefore, given the close interrelationship between economic activities and their environmental consequences, it is unsurprising to note that one of the examples of regional best practice in relation to EIA regulations can be found in the Protocol on Environmental Protection to the Antarctic Treaty and its Annex I.[125] The fundamental conceptual approach advanced by this instrument is that the environmental impacts of proposed activities are considered before the beginning of an activity within appropriate national procedures.[126] The EIA regulations are applicable to activities related to scientific research programmes, tourism and other governmental and non-governmental activities.[127] A notable feature is that a gradual approach informs this EIA scheme, where different requirements are demanded depending on the level of the impact affecting the environment. For example, if the particular activity is determined as having less than a minor or transitory impact, it may proceed,[128] otherwise, Annex I provides details on the procedure of an Initial Environmental Evaluation.[129] In a situation where a proposed activity is likely to have more than a minor or transitory impact,[130] a Comprehensive Environmental Evaluation must be prepared, taking into consideration particular requirements and procedure.[131] Moreover, the exchange of information[132] and the monitoring of key environmental indicators are critical to verify the impact of an activity after the comprehensive environmental evaluation.[133] Likewise, provision is made to mitigate impacts, or if necessary, to suspend, cancel or modify the particular activity.[134]

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[125] Madrid Protocol. Annex I. Environmental impact Assessment (EIA Annex).
[126] Ibid. Annex I: Article 1.
[127] Madrid Protocol. Article 8.
[128] Ibid. Annex I. Article 1.
[129] Ibid. Annex I. Article 2. Details on an initial environmental evaluation include the description of the proposed activity, purpose, location, duration and intensity, as well alternatives to the proposed activity and the consideration of cumulative impacts.
[130] Ibid.
[131] Ibid. Annex I. Article 3. See also: Committee for Environmental Protection (2007) *Procedures for intersessional CEP consideration of draft CEEs. CEP X.* Buenos Aires: ATS Secretariat.
[132] Madrid Protocol. Annex I. Article 6.
[133] Ibid. Annex I. Article 5.
[134] Ibid. Annex I. Article 5(2).

There are many novel features advanced by the regulations applicable to impact assessment and an interesting approach to coordination is evident where activities are planned jointly by Contracting parties. In such instances, the Parties involved must nominate one coordinator for the implementation of the EIA procedures.[135] In cases of emergency, the EIA Annex does not apply to an activity to be undertaken to safeguard human life, highly valued equipment and facilities or to facilitate the protection of the environment.[136] Another achievement regarding EIAs was the adoption of the revised Guidelines for Environmental Impact Assessment in Antarctica in 2016. These Guidelines aim to assist proponents of activities, facilitate cooperation and coordination in EIAs for joint activities, as well as to provide advice to operators, among other objectives.[137] Additionally, the Guidelines address elements that have to be considered in the EIA process, such as the activity, the environment, analysis and comparison of impacts, measures to minimise or mitigate impacts, monitoring and review of the EIA feedback process.[138]

7.2.4.3 Innovative uses of biodiversity, access to marine genetic resources

The biodiversity associated with the Antarctic and the CCAMLR maritime areas are both subject to scientific research including marine bioprospection activities. That said, the term "biological prospecting" is not defined in the Antarctic System. However, during the course of the 5th meeting of the Committee for Environmental Protection, the topic of biological prospecting was raised for the first time.[139] The subject has since been tackled in subsequent meetings, as Parties to the Antarctic Treaty have noted that biological prospecting continues unabated in Antarctica, and on-going discussions on biological prospecting and genetic resources are evolving in other international fora, such as the BBNJ negotiation process, as will be seen in chapter 8.

The approach is very much dependent on the consent of States and their willingness to share information. More specifically, governments are called on to annually exchange

[135] Ibid. Article 8(4).
[136] Ibid. Annex I. Article 7.
[137] Antarctic Treaty. Resolution 1 (2016), 3.
[138] Ibid.
[139] Antarctic Treaty Secretariat (2002) *Report of the Committee for Environmental Protection (CEP V)*. Buenos Aires: ATS Secretariat. Para 58-61.

relevant information and views relating bioprospection,[140] and also to report on bioprospecting activities carried out under their respective legal regimes with the objective to facilitate information exchange among Parties.[141] Again, we can see elements of progress towards a more coherent regional approach in so far as a step forward has been taken by some countries which have submitted working papers to explore the options on how to best address this activity in the ATS area. For example, the United Kingdom has submitted a working paper,[142] as well as New Zealand and Australia. The latter paper suggests that Antarctic biological prospecting should occur under the oversight of a Treaty Consultative Party and would require: a) a prior assessment of the potential environmental impacts, b) it be conducted under strict environmental guidelines, and c) it respects the freedom of scientific investigation and free exchange of scientific results from Antarctica.[143] That said, there is no consensus on such matters and different opinions have been expressed by Contracting Parties on the access regime that ought to apply to MGRs within the Antarctic framework. Furthermore, the Antarctic and Southern Ocean Coalition has pointed out that biological prospecting represents a further penetration of commercial and economic interests into Antarctica.[144]

7.2.4.4 Strengthening and building capacities

As seen in previous chapters, capacity building and technology transfer is another key element of the package deal under negotiation at the BBNJ process. The Antarctic Treaty system is significant in this context. For example, CCAMLR specifically calls for the contribution to capacity building of the developing Member countries, through financial assistance and training programs, as well as to strengthen their effective participation in the Scientific Committee.[145] Another pertinent example involves capacity building within the prevention and deterrence of IUU fishing, where CCAMLR

[140] ATS Resolution 7 (2005). Furthermore, governments have emphasized that the Protocol on Environmental Protection and CCAMLR should address the environmental aspects of scientific research and the collection of biological material in the Antarctic region. ATS Resolution 9 (2009).
[141] ATS Resolution 6 (2013).
[142] ATS, above n 139, para. 58.
[143] Delegation of Australia and New Zealand (2009) 'Regulation of biological prospecting under the Antarctic Treaty system,' *32nd Antarctic Treaty Consultative Meeting*. USA, 6-17 April.
[144] Antarctic and Southern Ocean Coalition (2013) 'Biological prospecting and the Antarctic environment,' *36th Antarctic Treaty Consultative Meeting*. Brussels, 20-29 May.
[145] CCAMLR. Resolution 31/XXVIII (2009). Para. 4

has developed a Policy to enhance cooperation between its members and non-contracting Parties involved in IUU fishing and/or trade. [146] As indicated previously, this policy has a specific section on capacity building, where the CCAMLR Commission agrees on a priority list of countries which may benefit from technical cooperation. With the objective to follow up these initiatives, CCAMLR Members are encouraged to report on the nature and outcomes of their technical cooperation. [147] Moreover, workshops and training events have been organised to enhance capacity building strategies with other regions.[148] Finally, it should be noted that CCAMLR also awards scholarships to assist scientists from CCAMLR Members, and preference is given to early career scientists from developing countries to participate in the work of its Scientific Committee and its Working Groups. [149]

7.2.4.5 Normative principles and approaches: CCAMLR's unique approach to ecosystem-based management

As a guiding principle in modern environmental and marine resource regulation and management, the ecosystem approach is a central feature of CCAMLR's approach to fisheries management.[150] Indeed, this is one of the reasons why CCAMLR is recognised worldwide as a leading organisation in the development of best practice on the ecosystem approach to managing marine resource related activities in ABNJ.[151] In this context, it is important to acknowledge the strong nexus between the ecosystem approach and the utilization of the best available science for this purpose.[152] As seen in previous paragraphs, the CCAMLR Scientific Committee plays a fundamental role in

[146] CCAMLR. *Policy to enhance cooperation between its members and non-contracting Parties*. Available at: http://archive.ccamlr.org/pu/e/e_pubs/cm/06-07/coop.pdf
[147] Ibid. Attachment B.
[148] Some workshops done in the framework of capacity building activities in CCAMLR are the following: African IUU capacity building workshop (CCAMLR-XXIX/09); and the African capacity building training event on catch documentation schemes and IUU fishing (CCAMLR-XXVIII/38).
[149] United Nations Division for Ocean Affairs and the Law of the Sea. *A Regular Process for global reporting and assessment of the State of the marine environment, including socioeconomic aspects. Preliminary inventory of existing opportunities and arrangements for capacity building for assessments*. Available at: http://www.un.org/depts/los/global_reporting/consolidated_version_240613.pdf
[150] M. Mooney-Seus, A. Rosenberg, *Best practices for high seas fisheries management: Lessons learned* (London: Royal Institute of International Affairs, 2007), 134.
[151] Ibid. See also: M. Ruckelshaus, T. Klinger, N. Knowlton, D. de Master (2008) 'Marine ecosystem-based management in practice: Scientific and governance challenges,' *BioScience*, Vol. 58, 53–63.
[152] Resolution 31/XXVIII. Recital 1.

assisting the CCAMLR Commission, as well as in facilitating the coordination of a coherent approach to ecosystem monitoring, research and management.[153] The main goal in the application of the ecosystem approach[154] in the management of CCAMLR fisheries[155] is to maintain target stocks at productive levels, without affecting dependent and related species.[156] In order to achieve this objective, particular conservation measures have been adopted in relation to the following: the conservation and management of krill (*Euphausia superba*, Euphausiidae) because of its central importance to the Antarctic ecosystem,[157] as well as the over-exploited fisheries of toothfish (*Dissostichus* spp., Nototheniidae);[158] the applicability of the precautionary approach;[159] and the management of the indirect effects of fishing on the ecosystem.[160] The overall goal has been to ensure that fisheries do not develop in an unsustainable manner beyond the capability of the Antarctic ecosystem to achieve the objectives of the CCAMLR Convention and related instruments.[161]

7.2.4.6 Settlement of disputes by peaceful means

The settlement of disputes is subject to the comprehensive and binding provisions under Part XV of UNCLOS and has been discussed under the crosscutting issues in the BBNJ negotiation process. In this regard, the CCAMLR Convention provides a pertinent example of best practice should a dispute arise between Contracting Parties. The general rule and the first desirable option is the use of pacific means to resolve the dispute, that is to say, negotiation, inquiry, mediation and conciliation. Should peaceful

[153] Ibid.
[154] CCAMLR Convention. Article 2(3).
[155] Ibid. Article 2(1).
[156] Ibid. Article 2(3).
[157] See: Conservation measure 21-03 (2016); Conservation measure 23-06 (2012); Conservation measure 51-02 (2008); Conservation measure 51-03 (2008); Conservation measure 51-04 (2016); Conservation measure 51-06 (2016); and Conservation measure 51-07 (2016).
[158] Conservation measure 10-05 (2016); Conservation measure 22-08 (2009); Conservation measure 32-09 (2016); Conservation measure 41-01 (2016); Conservation measure 41-03 (2016); and CCAMLR Resolution 15/XXII (2003).
[159] A. Constable, W. de la Mare, D. Agnew, I. Everson, D. Miller (2000) 'Managing fisheries to conserve the Antarctic marine ecosystem: Practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR),' *ICES Journal of Marine Science*. Vol. 57, 778–791.
[160] S. Garcia, 'Governance, science, and society: The ecosystem approach to fisheries,' in R. Grafton, et. al. (eds.) *Handbook of Marine Fisheries Conservation and Management* (Oxford: Oxford University Press, 2010), 87–98.
[161] Swedish National Board of Fisheries (1995) *Technical consultation on the precautionary approach to capture fisheries and species introductions*, Rome: FAO, 54.

means fail resolve the disagreement, recourse may be had at the International Court of Justice or through international arbitration.[162] Within the Antarctic Treaty, the Madrid Protocol also has provisions on dispute settlement. Similarly to CCAMLR, the ATS Parties are called to settle disputes by peaceful means.[163] A written declaration from the Party, at the time of signing the Protocol should indicate the means for the settlement of disputes,[164]otherwise the Party accepts the competence of the Arbitral Tribunal as the default dispute settlement forum.[165] Detailed procedures for dispute settlement are set out in the Madrid Protocol.[166]

7.2.4.7 Environmental liability, compensation of damages to the marine environment

In relation to liability, as another of the crosscutting issues addressed in the BBNJ negotiation process, Annex VI of the Madrid Protocol contains liability provisions applicable to environmental emergencies should they arise in relation to activities covered by the Protocol, namely: scientific research programmes, tourism and other governmental and non- governmental activities.[167] Furthermore, Parties must require its operators[168] to undertake preventive measures to reduce the risk of environmental emergencies and their potential adverse impact,[169] as well as to establish and implement contingency plans[170] and the procedures for immediate notification.[171] In the case of an environmental emergency, an effective response is required from operators.[172] Parties are encouraged to take action following a procedure on behalf of the operator, and the State operator[173] shall be liable to pay the costs of the response action which should have been undertaken.[174] The latter obligation is an effective mechanism to ensure effective compliance with regulatory obligations in light of the high costs of emergency responses in Antarctica. It is important to acknowledge in this

[162] CCAMLR Convention. Article 15.
[163] Madrid Protocol. Article 18.
[164] Ibid. Article 19.
[165] Ibid. Article 19(3).
[166] Ibid. Article 20.
[167] Ibid. Article 16.
[168] Ibid. Annex VI. Article 2 (c).
[169] Ibid. Annex VI. Article 3.
[170] Ibid. Annex VI. Article 4.
[171] Ibid. Annex VI. Article 3(3).
[172] Ibid. Annex VI. Article 5.
[173] Ibid. Annex VI. Article 10.
[174] Ibid. Annex VI. Article 6(2).

context that it is the operator which is ultimately liable in the case it fails to take prompt and effective response action.[175] The operator will pay an amount that reflects the costs of the response action that should have been taken.[176] These payments are directed to a fund established under the Antarctic Treaty framework, or to the Party that enforces the response mechanism.[177] Finally, Annex VI addresses exemptions from liability when an operator proves that the environmental emergency was caused by an act or omission necessary to protect human life or safety, by a natural disaster not reasonably foreseen, an act of terrorism or an act of belligerency against the activities of the operator.[178]

7.2.5 Replicating lessons from the Antarctic system in the CRD

7.2.5.1 Cooperation and coordination with international bodies

The Antarctic Treaty provides specifically for cooperative and coordination arrangements, such as the exchange of information and facilitation of cooperation on scientific research between Contracting Parties, rights of inspection, analysis of the reports from the observers, among other matters.[179] Likewise, cooperation is set as a basis for scientific, technical and educational programmes for the conservation of Antarctica.[180] It comprehends the provision of assistance in the preparation of EIAs, as well as the provision of information on environmental risk and assistance to minimize the effects of accidents.[181] In addition, cooperation between Parties with jurisdiction in adjacent areas to the Antarctic Treaty geographical scope is relevant to ensure that activities do not have adverse environmental impacts on those areas.[182] In a similar approach, the CCAMLR Commission seeks to cooperate with Contracting Parties on the conservation measures for stocks and associated species in marine areas adjacent to the Convention´s area.[183]

[175] Ibid. Annex VI. Article 6.
[176] Ibid. Annex VI. Article 6(3).
[177] Ibid. Annex VI. Article 12.
[178] Ibid. Annex VI. Article 8.
[179] Antarctic Treaty. Article 9(1).
[180] Madrid Protocol. Article 6(1).
[181] Ibid. Article 6(1).
[182] Ibid. Article 6(3).
[183] CCAMLR Convention. Article 11.

In seeking consistency on legal frameworks, the Madrid Protocol of the Antarctic Treaty calls upon Parties to consult and cooperate with other international instruments in force within the Antarctic Treaty system and their institutions.[184] Following on from this provision, there is an express requirement for coordination between the Antarctic Treaty's Committee on Environmental Protection, the President of the Scientific Committee on Antarctic Research and the Chairman of the CCAMLR Scientific Committee, which are the main figures in Antarctica's institutional framework.[185] Likewise in the CCAMLR framework, the Commission and its Scientific Committee are called to cooperate with the Antarctic Treaty Consultative Parties.[186] In relation to cooperation with other international organisations, CCAMLR cooperates with FAO and other Specialised Agencies,[187] pursuing cooperative arrangements with inter-governmental and nongovernmental organisations, including the Scientific Committee on Antarctic Research, the Scientific Committee on Oceanic Research and the International Whaling Commission.[188]

Finally, a number of Agreements and Memoranda of Understanding have been agreed between CCAMLR and other organisations. At the time of writing, three Agreements were in place between CCAMLR and other Regional Fisheries Management Organisations, namely: the South Pacific Regional Fisheries Organisation (SPRFMO),[189] the Commission for the Conservation of Southern Bluefin Tuna (CCSBT)[190] and the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC).[191] The three Agreements have several common elements, such as the goal to advance their respective objectives and enhance the conservation and rational use of stocks and species that are of interest to the

[184] Madrid Protocol. Article 5.
[185] Ibid. Article 10 (4).
[186] CCAMLR Convention. Article 13(1).
[187] Ibid. Article 13(2).
[188] Ibid. Article 13(3), (4).
[189] Arrangement between the South Pacific Regional Fisheries Management Organisation and the Commission for the Conservation of Antarctic Marine Living Resources. Available at: https://www.ccamlr.org/en/system/files/SPRFMO.pdf
[190] Arrangement between the Commission for the Conservation of Southern Bluefin Tuna and the Commission for the Conservation of Antarctic Marine Living Resources. Available at: https://www.ccamlr.org/en/system/files/CCSBT.pdf
[191] Arrangement between the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean and the Commission for the Conservation of Antarctic Marine Living Resources. Available at: https://www.ccamlr.org/en/system/files/WCPFC-CCAMLR%20Agreement%20%282014%29.pdf

Commissions.[192] This objective is achieved through the facilitation of cooperation and the exchange of information, including fishery data, harmonisation of approaches in areas of mutual interest, monitoring, control and surveillance,[193] consultative processes between the Secretariats, the grant of reciprocal observer status,[194] collaboration on research efforts relating to stocks and species of mutual interest, and cooperation on conservation measures, among other matters.[195]

Additionally, an MoU has been signed by CCAMLR and the Secretariat for the Agreement on the Conservation of Albatrosses and Petrels (ACAP), with the objective to join efforts and minimise the incidental by-catch of albatrosses and petrels in the CCAMLR area.[196] Some of the cooperation areas are the exchange of information concerning the by-catch of albatrosses and petrels; the implementation of education and awareness programs for fishermen; sharing of expertise, techniques and knowledge; and the reciprocal participation with observer status at relevant meetings.[197]

7.2.5.2 Improvement of knowledge, monitoring and reporting

Marine scientific research is the foundation of decisions underpinning good ocean governance. Thus it is unsurprising to note that in CCAMLR, Contracting Parties are called upon to provide statistical and biological data to the Commission and to the Scientific Committee. [198] Furthermore, CCAMLR has developed a Scheme of International Scientific Observation, which is one of the most important sources of scientific information and fundamental for assessing the impact of fisheries on the Antarctic ecosystem.[199] This entails a number of obligations, including the obligation placed on all vessels fishing in CCAMLR, which are required to carry an observer.[200]

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[192] Ibid. Para. 2.
[193] CCAMLR, SPRFMO, above n 189, para. 2.
[194] CCAMLR, CCSBT, above n 190, para. 3.
[195] CCAMLR, WCPFC, above n 191, para. 2.
[196] Memorandum of Understanding between the Commission for the Conservation of Antarctic Marine Living Resources and the Secretariat for the Agreement on the Conservation of Albatrosses and Petrels. Available at: https://www.ccamlr.org/en/system/files/MoU%20ACAP.pdf
[197] Ibid. Para. 2
[198] CCAMLR Convention. Article XX.
[199] Ibid. Article XXIV.
[200] CCAMLR. *CCAMLR Scheme of International Scientific Observation*. Available at: https://www.ccamlr.org/en/science/ccamlr-scheme-international-scientific-observation-siso

Moreover, the development of the *Scientific Observers Manual* by the CCAMLR Secretariat and Scientific Committee aims to assist Contracting Parties in planning observation programmes and recording data.[201] Another example is the CCAMLR Ecosystem Monitoring Programme (CEMP), which has developed a relevant database to provide and facilitate information of the effects of fishing on dependent species, as well as to detect and record significant changes in critical components of the marine ecosystem.[202] Both examples could be replicated in the CRD to ensure data sharing enhanced by an operational observer programme applicable to fishing vessels.

7.2.6 Appraisal of the Antarctic Treaty System and CCAMLR

The Antarctic Treaty System and the CCAMLR Convention are notable schemes that have moulded a significant framework for the protection and sustainable use of marine biodiversity in ABNJ. Both Conventions have extensive geographical scope extending to ABNJ, and are continuously evolving in response to challenges in ocean governance including the catastrophic effects of climate change. Furthermore, it must be kept in mind that the geographical scope is oceanic with the Convention Area applicable to about 10 per cent of the Earth's surface.

In relation to how each instrument advances the conservation and sustainable use of biodiversity in ABNJ, it is notable that the Antarctic Treaty has a robust regulatory scheme, complemented by the Protocol on environmental protection and further developed by carefully designed and comprehensive Annexes. In addition, CCAMLR has developed a comprehensive regulatory framework at a regional level for the conservation of marine biodiversity through the adoption of legally binding conservation measures. Accordingly, there appear to be various aspects of these regional approaches adopted within the Antarctic System that could be taken into consideration in the design of governance arrangements for the conservation and protection of biodiversity in other ocean regions including the CRD. In this regard, CCAMLR has advanced in the establishment of conservation measures, including: the restriction of fishing gears; the creation of marine protected areas; the development of area-based management tools seeking for a harmonised approach in spatial protection; the development of a list-based system for the protection of vulnerable species and

[201] Ibid.
[202] Conservation Measure 91-01 (2004).

habitats; and the ecosystem-based management approach, as well as the precautionary principle, to adapt conservation measures for new environmental conditions in Antarctica due to climate change; among others. Also, effective response actions to environmental emergencies, and the establishment of plans of cooperation and contingency, is a valuable arrangement to be included in a putative scheme for the CRD, where multiple economic activities occur and could pose risks to the marine environment and its biodiversity.

There are many features in the architecture of the Antarctic System that are noteworthy, including the strong coordination mechanism that exists between the Antarctic Treaty System and CCAMLR. Even though both are separate international Agreements, they are closely related and aligned at a regional level, adding value to the entire Antarctic System as a regulatory framework with specific policy objectives. Chief among the successes of the Antarctic System are the dynamic and cutting edge measures that facilitate the implementation of ecosystem-based management in ABNJ including the designation of MPAs for this purpose. In this context, as seen above, the Antarctic System has also progressed on some of the elements under discussion at the BBNJ negotiation process. The establishment of two MPAs in the high seas, namely the South Orkney Islands Southern Shelf MPA and the Ross Sea MPA; and the obligation to undertake EIAs under the provisions of the Protocol on Environmental Protection to the Antarctic Treaty and its Annex I, as well as following the Guidelines for Environmental Impact Assessment in Antarctica, are examples of best practice that ought to be replicated in other ocean regions. Within the Antarctic System discussions have been evolving in relation to bioprospection, and countries have been submitting working papers to develop informed positions. In regard to capacity building, it has been addressed in CCAMLR through the contribution to developing Member countries, in the form of financial assistance, training programs, effective participation in the Scientific Committee, workshops, and scholarships, among other examples. On crosscutting issues, environmental principles and approaches have been implemented in the Antarctic System, as the ecosystem approach is the cornerstone in these management frameworks. Additionally, it ought to be noted that provisions on dispute settlement in the Antarctic System could inform regional frameworks such as the CRD, as it is closely aligned with Part XV of UNCLOS. Finally, liability provisions applicable to environmental emergencies are contained in Annex VI of the Madrid Protocol.

In relation to cooperation and coordination, a key feature to be taken in consideration from the Antarctic System is the manner in which it works with other multilateral and regional organisations. This coordination approach is done through the conclusion of specific Agreements and Memoranda of Understanding, where common elements, such as the goals to advance their respective objectives and enhance the conservation and rational use of species of interest are agreed upon by the governing bodies involved. In addition, examples of facilitation and exchange of information, like the Scheme of International Scientific Observation and the CCAMLR Ecosystem Monitoring Program, could be promoted in the CRD to ensure data sharing enhanced by an observers programme.

All in all, the Antarctic region is facing many environmental and economic challenges that are negatively impacting its unique biodiversity. There are several ground-breaking approaches to marine environmental protection and the conservation of biodiversity that are influencing the progressive development of the law of the sea and the implementation of the normative principles underpinning UNCLOS and related agreements. Progress, however, has been slow in some respects, particularly in relation to the designation of an IMO PSSA in the Southern Ocean to address the risks posed by vessel-source pollution.[203] On the other hand the IMO has adopted the Polar Code, which came into effect on 1 January 2017, and related amendments to both the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL). These initiatives will undoubtedly improve the protection of the unique environment and eco-systems of the Antarctic region.[204]

[203] On the difficulties encountered at the IMO in this regard, see: N. Klein, J. Mossop, D. Rothwell, *Maritime Security: International Law and Policy Perspectives from Australia* (London: Routledge, 2010), 314; and D. Rothwell (2012) 'Polar Ocean Governance in the 21st Century,' *Ocean Yearbook*, Vol. 26, 343.

[204] The IMO has adopted other instruments, including: Resolution A.1024(26), December 2009; Resolution A.999(25), November 2007; and Resolution MEPC.189(60), March 2010.

7.3 PROTECTING BIODIVERSITY IN THE SARGASSO SEA: SHIFTING THE LEGAL PARADIGM FROM "OUT OF SIGHT OUT OF MIND" TO AFFIRMATIVE ACTION AND A SUI GENERIS REGIME

As the reader will have deduced from the discussion thus far, this thesis advances a rule-based order for the ocean and the principle of multilateral action to resolve contemporary challenges pertaining to human impacts on the marine environment. As highlighted in chapter 3, the high seas are subject to residual freedoms codified in treaty law and recognized in customary international law.[205] The exercise of jurisdiction is largely a matter for flag States in relation to its vessels, nationals and juridical persons under its jurisdiction and control.[206] International courts and tribunals have clarified the obligations placed on States to act with due diligence and to ensure that their laws and obligations are upheld.[207] One of the foremost themes and core arguments advanced by this thesis is that the flag State paradigm does not facilitate the conservation and sustainable use of biodiversity in areas beyond national jurisdiction, and there is thus a pressing need for regional action and more specific regimes that are unique to bio-geographic features such as the CRD.[208]

In light of the aforementioned considerations, the fourth and penultimate case study addressed in the present study is the Sargasso Sea. This case is highly significant as it is the focus of governance and management initiatives that are under progressive development but appear to be moving towards the adoption of a regional conservation and management scheme with a particular focus on protecting and preserving marine biodiversity.

Accordingly, in a similar scheme to chapter 2, the discussion in this Part is aimed at briefly addressing the Sargasso Sea from geographical, environmental, juridical and socio-economic perspectives. Additionally, it will synthesise contemporary

[205] Chapter 3, ante.
[206] Chapter 3, ante.
[207] *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, ITLOS Case No. 17 (Advisory Opinion) 2011. See also: *Definition of the minimum access conditions and exploitation of fisheries resources within the maritime zones under the jurisdiction of Sub-Regional Fisheries Commission (SRFC) Member States,* ITLOS Case No. 21 (Advisory Opinion) 2015; and the *South China Sea Arbitration (The Republic of Philippines v. The People's Republic of China)*, Permanent Court of Arbitration Case No. 9 (Inter-State arbitration) 2013.
[208] Chapter 1, ante.

developments through the prism of three main research questions explored in earlier case studies, namely: a) the policy and legal advancements of biodiversity protection within the Sargasso Sea; b) the evolution of this regional example in relation to the elements which are under negotiation for inclusion in the BBNJ Agreement; and c) what lessons can be derived and applied in the context of designing new arrangements for the Costa Rica Dome.

As will be seen, the Sargasso Sea is an excellent example of an evolving governance and management regime that is applicable to ABNJ, and one that is relevant to the CRD in so far as it shares many similarities, namely: unique geography characterised by dynamic oceanographic features that are subject to seasonal spatial variation; incomplete scientific knowledge; and the absence of a coherent regional seas approach to ocean governance and the protection of biodiversity in particular. Accordingly, as will be seen below, the Sargasso Sea and the CRD both faced three distinctive but nonetheless interrelated challenges; one that relates to geography; the second pertains to incomplete science; and the third concerns inadequate governance and a fragmented patchwork of laws and policies on the protection and preservation of the marine environment. This case study thus emphasises in particular the way scientific and cross-disciplinary influences are shaping the evolving structures of a new international regime applicable to the Sargasso Sea, as well as how best to overcome many of the policy and regulatory challenges in the integrated management of marine environmental pressures that are both transitory and inter-jurisdictional in geographical and material scope.

As an aside and before delving forth, it should be noted that the discussion below draws extensively from the extensive scholarship of Professor Freestone and the many reports and other publications by the Sargasso Sea Commission. The author is particularly grateful to Professor Freestone and his colleagues for sharing many insights concerning the progressive development of the rule of law as it applies to this particular ocean region and the biodiversity it supports.

7.3.1 Unique geographical and oceanographic features of the Sargasso Sea

Professor Freestone has noted that:

> High-seas habitats are likely to be more dynamic in space and time because high-seas areas are associated with dynamic oceanographic processes, and are less likely to be tied to physical, stationary features such as coral reefs (...) Instead, currents and fronts may play larger roles, and these may move in time, adding an additional layer of challenges.[209]

The Sargasso Sea is a 2 million square nautical mile unique open-ocean ecosystem in the Atlantic Ocean, being the only sea on Earth without a land boundary.[210] Considering this unique feature, other biological characteristics and oceanic conditions have been used to help define the Sea's location. More specifically, the Gulf Stream establishes the Sargasso Sea's western boundary; the North Atlantic Current defines its north boundary, while the Canary Current outlines the east limit, and the North Atlantic Equatorial Current shapes the south boundary.[211] This extraordinary geographical mobile characteristic is present in the Sargasso Sea and again this is replicated and very similar to the CRD, as ocean currents define their spatial area and as noted above their precise geographical limits are seasonally dynamic.[212] As is well documented in the scientific literature, the Gulf Stream eddies transport colder, nutrient-rich water into the Sargasso Sea, increasing its productivity.[213] The different types of eddies create localized upwelling and down-welling, and impact the upper layers of the Sargasso Sea by mixing surface and deeper waters. This affects nutrients, temperature and salinity, which together create localized areas of high productivity.[214] Likewise, and as seen in chapter 2, an equivalent oceanographic feature is present in the CRD, making these two areas highly productive, geographically mobile, rich in biodiversity and suitable for similar management and governance arrangements.

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[209] D. Freestone, et. al., (2014) 'Place-based dynamic management of large scale ocean places: Papahānaumokuākea and the Sargasso Sea,' *Stanford Environmental Law Journal*, Vol. 33 (2), 242.
[210] D. Laffoley, et. al. (2011) *The protection and management of the Sargasso Sea: The golden floating rainforest of the Atlantic Ocean. Summary Science and Supporting Evidence Case*. Washington, DC: Sargasso Sea Alliance, iii. See also: D. Freestone (2013) 'The final frontier: The Law of the Sea Convention and areas beyond national jurisdiction,' *U. C. Berkeley and the Korea Institute of Ocean Science and Technology Conference*. Korea, 21-24 May 2012, 1-15.
[211] M. Lomas, N. Bates, K. Buck, A. Knap. (eds.) (2011) *Oceanography of the Sargasso Sea: Overview of Scientific Studies*. Washington, DC: Sargasso Sea Alliance, 5.
[212] Ibid. 7. See also: J. Ardron, et. al., (2011) *Where is the Sargasso Sea? A report submitted to the Sargasso Sea Alliance*. Washington, DC: Sargasso Sea Alliance, 8.
[213] Ibid.
[214] Laffoley, above 210, 24.

7.3.2 Biodiversity in the Sargasso Sea: The golden rainforest of the Atlantic

Because of its unique and fragile biodiversity, the Sargasso Sea has been described as the golden rainforest of the Atlantic Ocean.[215] In this context, the most outstanding scientific characteristic of the Sargasso Sea is the ecosystem supported by the *Sargassum* seaweed, a drift algae that aggregates to form extensive floating mats on the surface of the ocean.[216] This particular condition makes the Sargasso Sea the only area in the world to function as a centre of distribution for a self-sustaining community of holopelagic drift algae.[217] These algae gather in enormous amounts of floating *Sargassum,* dominated by two species (*Sargassum natans* and *Sargassum fluitans),* thereby providing a rare and valuable habitat in deep open waters for multiple species.[218] From a biodiversity perspective, this unique ecosystem provides spawning areas, migration pathways and feeding grounds for different species, including endangered and commercially important ones.[219] Furthermore, exceptional communities of endemic species have adapted to the *Sargassum* mats and have evolved special shapes and colours for camouflage in this habitat.[220] The *Sargassum* is also home to more than 127 species of fish and approximately 145 invertebrate species, including molluscs, crustaceans and flatworms.[221] Due to the extraordinary characteristics of the Sargasso Sea ecosystem, perhaps one of the most pressing biodiversity management issues is the protection of the nursery grounds of vulnerable marine species in this ocean region. For example, hawksbill, green and loggerhead turtles use *Sargassum* mats as nurseries, which increase their chances of survival at a life stage when they are highly vulnerable to predators.[222] Most notably, five Atlantic sea turtles on the IUCN Red List and also

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[215] Ibid. 23.
[216] CBD Decision UNEP/CBD/COP/DEC/XI/17. 5 December 2012, 23.
[217] Sargasso Sea Commission (2016) *Lessons from the Sargasso Sea: Challenges to the conservation and sustainable use of biodiversity beyond national jurisdiction*. Washington, DC: Sargasso Sea Commission, 1.
[218] A. Hemphill (2005) 'Conservation on the high seas-drift algae habitat as an open ocean cornerstone. High seas marine protected areas,' *Parks*, Vol. 15(3), 48-56. See also: D. Calder (1995) 'Hydroid assemblages on holopelagic *Sargassum* from the Sargasso Sea at Bermuda,' *Bulletin of Marine Science*, Vol. 56, 537.
[219] CBD, above n 216.
[220] Ten species are known to be endemic to floating *Sargassum*, namely: the Sargassum crab (*planes minutes)*, Sargassum shrimp (*latreutes fucorum*), Sargassum pipefish (*syngnathus pelagicus*), Sargassum anemone (*anemonia sargassensis*), the Sargassum slug (*scyllea pelagica*), the Sargassum snail (*litiopa melanostoma*), the amphipods *sunampithoe pelagica* and *biancolina brassicacephala*, and the platyhelminth (*hoploplana grubei)*. Laffoley, above n 210, 13.
[221] Ibid. See also: Sargasso Sea Commission (2017) *Sargasso Sea Stewardship Plan, Executive Summary*. Washington, DC: Sargasso Sea Commission, 1.
[222] Laffoley, above n 210, 16.

protected by the framework of the Inter-American Convention for the Protection and Conservation of Sea Turtles,[223] are closely associated with the Sargasso Sea.[224] Similarly, various species of sharks and rays use the Sargasso Sea habitats in different life stages, namely: the whale sharks, porbeagle sharks, tiger sharks, manta rays and spotted eagle rays.[225]

The Sargasso Sea is also a migratory pathway and supports other threatened and endangered species listed on the CITES and CMS Annexes, including a wide range of cetaceans.[226] At least thirty species of whales and dolphins have been recorded in this area,[227] and some conservation treaties are already in place seeking to protect these species, such as the 1990 Caribbean Protocol Concerning Specially Protected Areas and Wildlife to the 1983 Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region.[228] However, the areas beyond the jurisdiction of the Caribbean States are still largely unregulated for the effective protection of these emblematic species and their associated ecosystems.

Many other fish stocks, including several tuna species and swordfish, migrate through the Sargasso Sea, it being truly an "ecological crossroads in the Atlantic Ocean linking its own distinct ecosystem with Africa, the Americas, the Caribbean and Europe."[229] Another example is the endangered American eel (*Anguilla rostrata*) and the European eel (*Anguilla anguilla*).[230] Both species spend their adult lives in freshwater ecosystems

[223] Inter-American Convention for the Protection and Conservation of Sea Turtles. 2164 UNTS 31. Entered into force on 2 May 2001.
[224] Five species of sea turtles have been observed in the Sargasso Sea, namely: the loggerhead (*caretta caretta*), green (*chelonia mydas*), leatherback (*dermochelys coriacea*), Kemp's ridley (*lepidochelys kempii*) and hawksbill (*eretmochelys imbricata*). Inter-American Convention for the Protection and Conservation of Sea Turtles (2014) 7th meeting of the Consultative Committee of Experts. CCE7-2014-Doc.3, 3. See also: F. Schwartz (1988) 'Aggregations of young hatchling loggerhead sea turtles in the Sargassum off North Carolina,' *Marine Turtle News*, Vol. 42(9), 9, 10; and P. Luschi, et. al., (2003) 'A review of long-distance movements by marine turtles and the possible role of ocean currents,' *OIKOS*, Vol. 103, 293, 294.
[225] Laffoley, above n 210, 14.
[226] Sargasso Sea Commission, above n 217, 1. See also: A. Stevenson (2011) *Humpback Whale Research Project, Bermuda*. Washington, DC: Sargasso Sea Alliance, 4.
[227] Laffoley, above n 210, 26.
[228] Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. 1506 UNTS 157. Entered into force on 11 October 1986.
[229] Sargasso Sea Commission, above n 221, 1.
[230] Inter-American Convention for the Protection and Conservation of Sea Turtles, above n 224, 3. See also: O. Spijkers, A. Oude Elferink (2016) 'Potential for a new CMS Agreement on the European eel,' *First Range State Workshop on the European Eel*. Galway, Ireland: UNEP/CMS;

in North America and Europe, and later they start a vast migration for thousands of kilometres to spawn in the Sargasso Sea, where their larvae mature and subsequently go back to their respective inland habitats.[231]

As mentioned above, due to its ability to form extensive floating mats and the immense richness of biodiversity it hosts and supports, the Sargasso Sea has been referred to as the floating golden rainforest of the ocean.[232] Crucially, it was designated as an EBSA in 2012[233] and it was also included in the UNESCO Report 'World Heritage in the High Seas' as an illustration of potential outstanding universal value in the high seas, reflecting its uniqueness and merit for further World Heritage protection.[234]

7.3.3 Management and governance initiatives: Plugging the regulatory deficit

As a starting point, Professor Freestone has noted that the protection of large-scale marine areas provides a unique set of challenges from management and governance perspectives in so far "as these areas often encompass large, pelagic processes and are also likely to encompass highly migratory species or dynamic oceanographic features."[235] Regarding the juridical framework, in the more than thirty years since the adoption of UNCLOS, the cooperative regime aimed for the areas beyond the jurisdiction of States has not yet been fully realised.[236] Moreover, Dr. Freestone highlights the inherent weaknesses in the silo-system and points out that:

> Within the sectoral approach in the treaty regimes applicable to ABNJ, although the Parties to all these treaties must have regard to the sweeping obligation of article 192 of UNCLOS to protect and preserve the marine

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and M. Gollock (2011) *European eel briefing note for Sargasso Sea Alliance*. Washington DC: Sargasso Sea Alliance.

[231] CBD Secretariat (2014) 'Ecologically or Biologically Significant Marine Areas (EBSAs): Special places in the world's oceans,' *CBD Wider Caribbean and Western Mid-Atlantic Regional Workshop*. Recife, Brazil, 28 February - 2 March 2012. UNEP/CBD, 53.

[232] Laffoley, above n 210, 23.

[233] CBD, above n 216. See also: Freestone, above n 210, 13.

[234] See Chapter 3, section C. See also: D. Freestone, D. Laffoley, F. Douvere, T. Badman (2016) *World Heritage in the High Seas: An idea whose time has come*. UNESCO. Paris, France, 2016, 38.

[235] Freestone, above n 209, 193.

[236] D. Freestone (2016) 'Governance of areas beyond national jurisdiction: An unfinished agenda,' in J. Barrett, R. Barnes (eds.), *Law of the Sea: UNCLOS as a Living Treaty* (London: BIICL, 2016), 231.

> environment, the modalities by which this is done vary widely from regime to regime. Each sectoral regime has its own distinctive protection mechanisms and assesses differently the factors that need to be taken into account; the result is a plethora of distinct sectoral regimes designed to protect specific areas of the ocean from individual sector-specific risks.[237]

A more serious circumstance originates when the areas beyond the jurisdiction of States does not have a regional management authority in place, which is the case for the Sargasso Sea (and the CRD). This ocean region lacks a management regime and a governing authority that would allow for its effective conservation, in contrast to the other regional cooperative regimes examined elsewhere in this study, such as under the OSPAR or the Barcelona Conventions, which have evolved from Agreements focused on addressing vessel-source pollution into broader management approaches that are aimed at protecting and preserving marine ecosystems.[238]

The law of the sea is not static, and is subject to review and reform. In this context, there is an important management initiative underway to address this lacuna at a regional level pertaining the Sargasso Sea. The initiative was first designed as a "project to protect the Sargasso Sea ecosystem in ABNJ using existing international institutions, and not waiting for the United Nations to take more comprehensive action,"[239] starting under the chapeau of the Sargasso Sea Alliance, which later evolved into the current form of the Sargasso Sea Commission.

To evaluate progress with a view to designing a similar system for the CRD, it is useful to highlight some of the milestones passed to date in this process of transformation. The Sargasso Sea Alliance started as a partnership led by the Government of Bermuda, in collaboration with scientists, international marine conservation groups and private donors, to promote the importance of the Sargasso Sea.[240] The Government of Bermuda, a strong leader on marine conservation in the Caribbean region,[241] decided to improve the stewardship of its EEZ and the surrounding high seas, with the view to

[237] Ibid. 236. See also: D. Freestone, F. Bulger (2016) 'The Sargasso Sea Commission: An innovative approach to the conservation of areas beyond national jurisdiction,' *Ocean Yearbook Online*, Vol. 30, 85.
[238] Chapter 6.
[239] Freestone, above n 236, 232. See also: Freestone, above n 209, 202.
[240] Laffoley, above n 210, iv.
[241] Freestone, above n 236, 242. See also: Freestone, above n 209, 210.

bringing international attention to the global ecological and biological significance of the Sargasso Sea.[242] This political landmark, together with the support of international conservation agencies and marine institutions, further advanced in the creation of the Sargasso Sea Alliance in 2010.[243]

After years of intensive work building up political momentum and engagement, another milestone was achieved in 2014, with the signature of the Hamilton Declaration on Collaboration for the Conservation of the Sargasso Sea by the Governments of Bermuda, Azores, Monaco, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.[244] Currently, other governments have joined the effort to advance conservation actions in the Sargasso Sea and have signed this Declaration, namely: the British Virgin Islands, Canada, the Bahamas and Cayman Islands.[245]

From a legal perspective it is important to highlight that the Hamilton Declaration is a non-binding political statement,[246] which recognises the challenges of protecting ABNJ,[247] but calls for effective collaboration in pursuing conservation measures for the Sargasso Sea ecosystem.[248] Therefore, it is a historic breakthrough, given that it is the "first non-binding instrument designed to provide a framework for voluntary intergovernmental collaboration to promote measures, through existing international organisations, to minimize the adverse effects of human activities in an ecosystem that is primarily in ABNJ."[249] The significance of this soft law approach of course has inherent strength in so far as it allows for the development of appropriate structures and procedures. Notably, with the view to further advance on institutional arrangements for effective collaboration, the Hamilton Declaration established the Sargasso Sea Commission,[250] which operates as a stand-alone legal entity established pursuant to

[242] Hamilton Declaration. Adopted in Bermuda on 11 March 2014. Recital 2.
[243] Laffoley, above n 210, iv.
[244] Freestone, Bulger, above n 237, 80.
[245] Sargasso Sea Commission. About the Commission. Available at: http://www.sargassoseacommission.org/about-the-commission/hamilton-declaration
[246] Hamilton Declaration. Recital 9. See also: D. Freestone, K. Morrison (2014) 'The signing of the Hamilton Declaration on collaboration for the conservation of the Sargasso Sea: A new paradigm for high seas conservation?,' *The International Journal of Marine and Coastal Law*, Vol. 29, 345-362.
[247] Hamilton Declaration. Recital 3.
[248] Ibid. Para. 3.
[249] Freestone, above n 236, 253.
[250] Hamilton Declaration. Para. 6.

Bermudian and United States law.[251] A Meeting of Signatories was also established by this Declaration, composed of representatives or focal points from the Signatory Governments. The Meeting of the Parties convenes on a regular basis to provide advice, proposals and guidance to the Commission; review and comment on the Commission's proposed work programme and action plans; and pursue collaboration and cooperation, among other functions.[252] The establishment of a similar institutional arrangement for the CRD will be further explored in chapter 9.

There are 'normative teeth' in the arrangements in so far as the Hamilton Declaration also assigned multiple tasks and functions to the Commission,[253] such as the development of proposals that the Signatories may submit or support at regional or international organisations with relevant competences in the Sargasso Sea.[254] In developing these proposals, the Commission must use the best available science and take in consideration the ecosystem approach and the precautionary approach, to recommend: a) measures to control, minimize and eliminate the adverse effects of international shipping activities; b) measures to minimize adverse effects of fishing activities, including for the protection of vulnerable marine ecosystems; and c) measures to maintain the health, productivity and resilience of the Sargasso Sea.

Additional mandates for the Commission are to promote outreach, public awareness and scientific research; to monitor the effects, including cumulative effects, of any anthropogenic activities in the Sargasso Sea; and encourage cooperation in developing and promoting contingency plans for responding to any significant pollution incidents, among other matters.[255]

A quick review of a number of important milestones reveals impressive progress. During the first meeting of the Sargasso Sea Commission in 2014, for instance, six priority areas were established for the first two-year work programme, namely: international recognition of the ecological importance of the Sargasso Sea; fisheries and fisheries habitat conservation; impacts from international shipping; impacts to the

[251] Ibid. See also: Sargasso Sea Commission, above n 245.
[252] Hamilton Declaration. Para. 5.
[253] Ibid. Para. 8. Annex II.
[254] Ibid. Para. 8.
[255] Ibid. Annex II.

seafloor and seabed; conservation of migratory species; and defining a role for data and information management.[256]

In seeking international recognition of the ecological importance of the Sargasso Sea, this initiative has been presented in different global forums, such as the Ad Hoc Open-ended Informal Working Group to Study Issues Relating to the Conservation and Sustainable Use of Marine Biological Diversity beyond Areas of National Jurisdiction[257] and the U.N. Informal Consultative Process on the Law of the Sea.[258] Additionally, the work on raising awareness led by the Bermuda Government and the Sargasso Sea Alliance has been recognized by the UN General Assembly within the Annual Omnibus Resolutions on Oceans and Law of the Sea.[259] Furthermore, and as mentioned in previous paragraphs, the Sargasso Sea was proposed as an EBSA[260] in the Wider Caribbean and Western Mid-Atlantic regional workshop, and later it was formally described as an EBSA during the CBD COP XI in 2012.[261] Another important cooperation exercise took place in 2012, where the Sargasso Sea Alliance signed a Collaboration Agreement with the OSPAR Secretariat to "maximize opportunities for the sharing of research, expertise and practical experience in seeking to protect the marine environment of the North Atlantic, particularly in ABNJ,"[262] as both oceanic regions have similar physical characteristics and species interconnect between these marine ecosystems. Other vital elements included in this Collaboration Agreement encompass: sharing updated scientific information; cooperation on EIAs and SEAs; and notification on proposed anthropogenic uses, among others.[263]

Most recently, the pace of progress has picked-up another notch again with the Commission approving the Sargasso Sea Stewardship Plan in April 2017, which is:

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[256] Freestone, Bulger, above n 237, 85-89.
[257] The Ad Hoc Open-ended Informal Working Group later evolved in the BBNJ negotiation process as it will be seen in Chapter 8.
[258] Freestone, above n 209, 211.
[259] UNGA Resolution A/RES/67/78, December 11 2012. Para. 119.
[260] CBD Secretariat (2012) *Report on of the Wider Caribbean and Western Mid-Atlantic regional workshop to facilitate the description of ecologically or biologically significant marine areas*. Recife, Brazil: UNEP/CBD (U.N Doc. UNEP/CBD/SBSTTA/16/INF/7).
[261] CBD, above n 216.
[262] OSPAR Commission and Sargasso Sea Alliance (2012) Collaboration arrangement between the Secretariats of OSPAR Commission and the Sargasso Sea Alliance. Available at: https://www.ospar.org/documents?v=32924. Para. 4-5.
[263] Ibid. Para. 9.

> Designed to form the basis for the development of a comprehensive long term work programme for the Sargasso Sea Commission (…) including strategies and activities that can be taken by governments, private associations, entities or individuals, and the Sargasso Sea Commission and its partners, for the conservation of the Sargasso Sea ecosystem.[264]

The Plan is considered a living instrument with ambulatory intent,[265] and seven main topics are tackled where critical priorities are identified to address the following issues: a) biodiversity conservation; b) migratory species; c) seafloor and seabed; d) fisheries and fisheries habitats; e) shipping and other vessel traffic; f) research, monitoring and information management; and g) education and outreach.[266] Certainly, the action lines comprised in this Stewardship Plan are valuable and practical examples to guide the elaboration of a management scheme for the CRD, as will be further discussed in chapter 9 of this study.

7.3.4 Externalities at play in the regulatory process

The backbone of this thesis is the law in action and in advancing solutions that overcome the challenges encountered in designing sensible governance and management arrangements for the conservation and sustainable use of biodiversity in the CRD, based upon best practice elsewhere and in tandem with the progressive development of international law. Beyond the realm of law-making, one nonetheless has to keep in mind that there are many other factors at play, sometimes referred to as externalities, in driving the regulatory and governance processes forward at local, national, regional and multilateral levels. Most notably, the Sargasso Sea supports diverse economic activities[267] such as fisheries and tourism, as well as supplying indirect benefits from ecosystem services associated with the open ocean, coral reefs, coastal systems and coastal wetlands.[268] Accordingly, in line with the scheme advanced

[264] Sargasso Sea Commission, above n 221, 5.
[265] Ibid. 6.
[266] Ibid. 7-12.
[267] U. Sumaila, V. Vats, W. Swartz (2013) *Values from the resources of the Sargasso Sea*. Washington, DC: Sargasso Sea Alliance. See also: J. Hallett (2011) *The importance of the Sargasso Sea and the offshore waters of the Bermudian Exclusive Economic Zone to Bermuda and its people*. Washington, DC: Sargasso Sea Alliance; and J. Roberts (2011) *Maritime traffic in the Sargasso Sea: An analysis of international shipping activities and their potential environmental Impacts*. Hampshire, UK: Sargasso Sea Alliance.
[268] Sargasso Sea Commission, above n 221, 3.

in chapter 2, the following paragraphs will look at the main economic activities which take place or benefit from the resources directly linked with the Sargasso Sea: fisheries, tourism, seabed cables, and commercial shipping. In addition, the potential development of activities including seabed mining and applied marine scientific research are also considered in less detail in this section.

7.3.4.1 Tragedy of inadequate fisheries management in the Sargasso Sea

The Sargasso Sea used to be perceived as a low productivity area, "but it boasts a net annual rate of primary production that, per unit area, matches levels in some of the most productive regions in the global ocean."[269] It significantly contributes to the economies of Bermuda and other countries in the Caribbean Region. For example, commercially important fisheries benefit from the habitat provided by the Sargasso Sea, such as tunas (*Thunnus* sp.), wahoo (*Acanthocybrium solandri*), eels (*Anguilla* spp.), billfish, like the white marlin (*Tetrapturus albidus*), the blue marlin (*Makaira nigricans*), mahi mahi (*Coryphaena hippurus*), American butterfish (*Peprilus triacanthus*), and grey triggerfish (*Balistes capriscus*), among others.[270]

Therefore, the importance of this oceanic area should not be underestimated, as the Sargasso Sea supports important local and international pelagic fisheries. Currently Venezuela, Mexico, the United States and Japan are the most active fishing countries in the Sargasso Sea, [271] surpassed only by Chinese Taipei, which is the largest fishing entity in the Region, accounting for close to 50 per cent of the total catch since 1950.[272] It is important to bear in mind that the greatest values and largest catches are taken from the high seas areas in the Sargasso Sea,[273] vastly contributing to the estimated economic impact of fishing in the Sargasso Sea of USD$171 million a year.[274]

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[269] CBD Secretariat, above n 260, 48.
[270] Sumaila, Vats, Swartz, above n 267, 18. See also: South Atlantic Fishery Management Council (2002) *Fishery management plan for pelagic Sargassum habitat of the south Atlantic Region including a final environmental impact statement, initial regulatory flexibility analysis, regulatory impact review, and social impact assessment/fishery impact statement*. Available at: http://www.gc.noaa.gov/documents/gcil_safmc_fmp.pdf
[271] Sumaila, Vats, Swartz, above n 267, 7.
[272] Ibid. 15.
[273] Ibid. 7, 10.
[274] Ibid. 11.

Another relevant fishery dependent on *Sargassum* is the eels' fishery, which is terrestrial in scope but linked with the ocean environment in so far as catadromous fish migrate to and from the high seas as parts of their life cycle.[275] As noted above, the Sargasso Sea is the single largest spawning area of the European and American eel.[276] Even though the European eel has been listed in CITES and CMS, and classified by IUCN as critically endangered,[277] approximately 11,000 tons of eel that originate from the Sargasso Sea are caught in North America and Europe annually, generating a total landed value of about USD$120 million per year.[278] High seas fishing for catadromous species is prohibited under UNCLOS[279] and both the European and American Eel are included in CMS and CITES Appendices, subsequently being subject of specific management and conservation measures.[280] Specifically on the European eel, further measures have been taken to recover these stocks under the European Union Eel Management Plans,[281] which contain measures aimed at *inter alia*: reducing commercial fishing activities; restocking measures; transportation of silver eel from inland waters to waters from which they can escape freely to the Sargasso Sea; along with structural measures to improve river habitats, [282] and provision of information about ships engaged in eel fishing, [283] among others. Moreover, as noted in the 2016 CMS/Sargasso Sea Commission workshop in Galway, additional measures could be envisioned to effectively ensure the long-term sustainability of the European eel, for example, through a CMS Agreement or MoU that includes options like freshwater habitat restoration, stocks assessments, monitoring programmes, protection for key locations (such as the Sargasso Sea), transboundary cooperation and collaboration to conserve freshwater and marine habitats, and other innovative actions to protect the European eel populations.[284]

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[275] D. Freestone, K. Morrison (2012) 'The Sargasso Sea Alliance: Seeking to Protect the Sargasso Sea,' *The International Journal of Marine and Coastal Law*, Vol. 27, 648.
[276] Sumaila, Vats, Swartz, above n 267, 11.
[277] The European Union has established an eel recovery plan. Likewise, Canada has introduced measures to regulate eel fishing and eel escapement back to the sea. Laffoley, above n 210, 22, 23.
[278] Sumaila, Vats, Swartz, above n 267, 17.
[279] UNCLOS. Article 67.
[280] Spijkers, Oude Elferink, above n 230, 6, 12.
[281]European Union Council Regulation No. 1100/2007, 18 September 2007.
[282] Ibid. Article 2(8).
[283] Ibid. Article 11.
[284] Spijkers, Oude Elferink above n 230, 12. See also: UNEP/CMS/COP11/Doc.24.1.18 Rev.1, 12 September 2014.

Similarly, the Sargasso Sea is an important habitat for Atlantic swordfish (*Xiphias gladius*), and commercial catches of this specie in the West Atlantic are focused on the Gulf Stream and associated frontal zones.[285] In relation to recreational fishing, directly associated with billfish, in 2007 it represented USD$37 million in the Caribbean, acquiring major economic significance in the region.[286]

In spite of the rich biodiversity and multiple fish species present in the Sargasso Sea, it lacks a specific regional ocean conservation organisation or a regional fisheries management organisation, "in contrast with the North-East Atlantic, where ABNJ are included within the jurisdictional area of both a regional environmental agreement (OSPAR Convention) and a corresponding regional fisheries management body (NEAFC)."[287] However, some RFMOs[288] have competence in particular areas of the Sargasso Sea. The first one is the International Commission for the Conservation of Atlantic Tunas (hereafter, ICCAT).[289] It was established in 1966 and has regulatory authority over fisheries of tunas and tuna-like species in the Atlantic Ocean and adjacent seas. Subsequently, its fisheries management regulations are applicable in some of the Sargasso Sea areas. ICCAT's functions encompass the study and compilation of fishery statistics from its members and other entities fishing in the Atlantic Ocean; coordinate research on stock assessment; develop scientific-based management advice; and provide mechanisms for Contracting Parties to agree on management measures, among other matters.[290]

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[285] Ibid. 16.
[286] Sumaila, Vats, Swartz, above n 267, 17.
[287] Freestone, Bulger, above n 237, 83.
[288] Nevertheless, it must be pointed out that high seas fisheries management in the Sargasso Sea is fragmented and poorly enforced, lacking sufficient coordination between the RFMOs with competence in this oceanic area. Sea Education Association (2015) *A marine management proposal for the Sargasso Sea*. Massachusetts, USA: Sea Education Association, 62.
[289] International Convention for the Conservation of Atlantic Tunas. 673 UNTS 63. Entered into force on 21 March 1969. Contracting Parties to this Convention are: South Africa, Japan, Gabon, Russia, Côte D'Ivoire, Morocco, Brazil, France, Canada, Ghana, Cap-Vert, Uruguay, Angola, São Tomé e Principe, Republic of Korea, Guinea Ecuatorial, Guinée, United Kingdom, Libya, China, Venezuela, European Union, Namibia, Barbados, Honduras, Algérie, Mexico, Turkey, Norway, Senegal, Tunisie, Panama, Trinidad & Tobago, Albania, Sierra Leone, Mauritania, Curaçao, Vanuatu, Iceland, Liberia, Philippines, Nicaragua, Guatemala, El Salvador, Belize, Syria, St. Vincent & The Grenadines, Nigeria, Egypt, Guinea-Bisáu.
[290] International Convention for the Conservation of Atlantic Tunas (ICCAT Convention). Annex I. Article IV (2). Also, with the view to strengthening coordination, ICCAT has signed an Agreement with FAO to ensure cooperation between both organisations on consultation processes, exchange of information, mutual assistance and joint action in fields of common interest, particularly in respect to the collection and analysis of statistics, stock assessment and the formulation of conservation and management measures relating to tunas and tuna-like fish of

These management arrangements are significant and merit further consideration here. Specifically in relation to the Sargasso Sea, ICCAT established Resolution No. 05-11[291] on Pelagic *Sargassum*, which requested Contracting Parties to provide to the Sub-Committee on Statistics (SCRS) information about activities that impact pelagic *Sargassum* on the high seas, directly or indirectly, with particular emphasis on the Sargasso Sea. Thereafter, in 2012 ICCAT requested the SCRS to examine the available data and information concerning the Sargasso Sea and its ecological importance to tuna and tuna-like species and ecologically associated species.[292] The SCRS has suggested continuation of its work on elements such as identifying indicators from the Sargasso Sea ecosystem that are responsive to fluctuations in recruitment of ICCAT species; estimate biomass of target species from data derived from the Sargasso Sea; and determine the annual level of fishing efforts in the Sargasso Sea, among other matters.[293] However, as it will be seen at the end of this section, follow up actions from ICCAT to continue supporting the Sargasso Sea project have been challenging.

With a broader scope for conservation, and unlike ICCAT, which only focuses on the management of tuna and tuna-like species, the Northwest Atlantic Fisheries Management Organisation (hereafter, NAFO)[294] is the second organisation with competence in specific areas of the Sargasso Sea. NAFO is committed to the conservation of all fishery resources within its Convention area, which extends to the northern edge of the Sargasso Sea.[295] Since 2007, NAFO has implemented the ecosystem approach to fisheries management by committing to protect the associated marine ecosystems of fish stocks under its mandate.[296] Moreover, in 2013 NAFO's

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the Atlantic Ocean. Agreement between the Food and Agriculture Organisation of the United Nations and the International Commission for the Conservation of Atlantic Tunas. Article 1.

[291] ICCAT. Resolution 05-11 (2005).

[292] ICCAT. Resolution 12-12, (2012). See also: ICCAT (2013) *Report for biennial period 2012-2013*. Madrid: ICAAT, 215.

[293] ICCAT (2016) *An assessment of the ecological importance of the Sargasso Sea to tuna and tuna-like species and ecologically associated species*. Canada: ICAAT, 2011. See also: B. Luckhurst, F. Arocha (2015) *Evidence of spawning in the southern Sargasso Sea of fish species managed by ICCAT albacore tuna, swordfish and white marlin*. Bermuda: ICAAT.

[294] Convention on future Multilateral Cooperation in the Northwest Atlantic Fisheries. 1135 UNTS 369. Entered into force on 1 January 1979. Parties to this Convention are the following: Bulgaria, Canada, Cuba, Denmark, European Union, France, Iceland, Japan, Republic of Korea, Norway, Russian Federation, Ukraine, United States of America.

[295] Sea Education Association, above n 288, 59.

[296] Amendment to the Convention on future Multilateral Cooperation in the Northwest Atlantic Fisheries. NAFO/GC Doc. 07/4. Recital 8. Article III.

Scientific Council noted that "forage areas or habitat for living marine resources that could be impacted by different types of fishing relevant to NAFO management are limited to those associated with the New England and Corner Rise Seamounts."[297] Subsequently, in 2016 NAFO established a moratorium on bottom trawling in its area of jurisdiction,[298] the latter initiative will apply until the 31 of December 2020,[299] including both seamounts located in the Sargasso Sea.[300] It is important to acknowledge that this conservation action taken by NAFO brings together two different ABMTs, namely: the VME regime with the closure of bottom trawling in various seamounts, and the EBSA framework that has been applicable to the Sargasso Sea since 2012.[301] Furthermore, according to Dr. Diz "the combination of these two scientific tools culminated in meaningful progress that should be replicated on a wider (and speedier) scale in giving effect to the duty to protect, conserve and sustainably use marine biodiversity.[302]

Finally, the Western Central Atlantic Fishery Commission (hereafter, WECAFC),[303] is a FAO fisheries advisory body, with no regulatory powers but with competence and a mandate to advise on the conservation of marine life in the Western Central Atlantic, where part of the Sargasso Sea is located.[304] WECAFC promotes the precautionary approach and ecosystem based management, two pillars of the Sargasso Sea project.[305] Accordingly, the Sargasso Sea Commission has been in communication with this body and has participated in WECAFC meetings, including a workshop on management and conservation of billfish in the Western Central Atlantic.[306]

After taking a brief look at fisheries related to the Sargasso Sea, it is vital to recognize the economic importance of fish stocks supported by this open-ocean ecosystem. Despite the complex ecology of the region, it is of major concern that several of these

[297] NAFO. Scientific Council Meeting. 23-27 September 2013, 311.
[298] NAFO. Conservation and Enforcement Measures 2015. FC Doc. 15/1.
[299] NAFO. Conservation and Enforcement Measures 2017. FC Doc. 17-01, 25.
[300] D. Diz (2016) 'The seamounts of the Sargasso Sea: Adequately protected?,' *The International Journal of Marine and Coastal Law*, Vol. 31, 359.
[301] Ibid.
[302] UNFSA. Article 5(g); CBD. Articles 2, 8, 22; UNCLOS. Article 194(5). See also: Diz, above n 300, 370.
[303] WECAFC was established under FAO Resolution 4/61 (1973), amended by Resolution 3/74 (1978), and Resolution 1/131 (2006).
[304] Freestone, above n 209, 217.
[305] Ibid.
[306] Freestone, above n 236, 252.

commercially- and recreationally- targeted stocks are declining due to high fishing pressures.[307] Furthermore, the food security variable in the wider Caribbean adds another element of crucial consideration for the protection of this highly productive area. Notably, the absence of strong regional arrangements that go well beyond the species approach is an obvious lacuna in the current regional structures that needs to be addressed urgently to ensure the conservation and sustainable use of marine living resources and their associated biodiversity in the Sargasso Sea. A risk-based approach is probably the best course of action for the adoption of stock restoration measures, but efforts to date have fallen well short of international practice on achieving Target 14.2 of SDG 14.[308] For example, all targeted tuna and tuna-like species regulated by ICCAT are on the IUCN Red List.[309] In this context, the ICCAT has established management measures for different species of tuna, like the bluefin, yellowfin and bigeye tuna; but catch limits have not been set for other species known as small tunas, which spawn in the Sargasso Sea, and despite their importance, few management provisions are in place to ensure their sustainable use.[310]

Another management challenge in the Sargasso Sea region is the by-catch of species that are not the main focus or target of the fishing industry. In this regard, gill nets are still used in the Sargasso Sea area, which is a gear associated with high levels of by-catch.[311] In relation to IUU fishing, there have been some positive developments, in so far as recent controls on the trade of large pelagic species managed by ICCAT has shown a decline of IUU activity targeting these species.[312]

7.3.4.2 Marine tourism: Nascent and growing sector

[307] Sea Education Association, above n 288, 62.
[308] SDG 14. Target 14.2. "By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans." Available at: https://sustainabledevelopment.un.org/sdg14
[309] Laffoley, above n 210, 33. See also: D. Pauly, R. Watson, J. Alder (2005) 'Global trends in world fisheries: Impacts on marine ecosystems and food security,' *Philosophical transactions of the Royal Society B*, Vol. 360, 5–12.
[310] Ibid. 33.
[311] Ibid. 34.
[312] Ibid. 35. See also: Marine Resources Assessment Group Ltd (2005) *IUU fishing on the high seas: Impacts on Ecosystems and Future Science Needs*. London: Marine Resources Assessment Group Ltd.

There are several parallels between the Sargasso Sea and the CRD in relation to the rapid growth of marine tourism in the littoral States and the inter-relationship with the legal protection of high seas biodiversity. As in many regions of the world, ecotourism has been expanding in the Caribbean for the last years, and has been developing as an important income for populations in coastal and rural areas. Emblematic species support these touristic activities, for example, humpback whales are the protagonists of an increasing whale watching industry estimated to be worth over $22 million annually, in countries like Antigua and Barbuda, Dominican Republic, Grenada, Guadeloupe, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines.[313]

Additionally, the Sargasso Sea plays a key role in maintaining a healthy reef ecosystem by providing nutrients, current flushing and sustaining different fish species.[314] These services bring exponential benefits in the particular case of Bermuda, where the total value of recreation, culture and reef-associated tourism comes to approximately USD$443 million per year.[315] Other species also contribute to the ecotourism industry rising in the Caribbean, such as turtles and sea birds, which use the Sargasso Sea as a nursery area and as part of their migration routes.[316]

Bearing in mind the different ecosystem services that the Sargasso Sea offers to several species, it is clear that the tourism sector significantly contributes to regional and local economies,[317] and that a precautionary management and ecosystem-based approach are needed to protect and manage the biodiversity associated with this unique sea and ensure that the services it provides continue in the future.

7.3.4.3 Addressing the risks posed by navigation and vessel-source pollution

Busy international shipping lanes from the Gulf of Mexico and the Caribbean to Western Europe and the Mediterranean pass through the Sargasso Sea, making it one of the most heavily trafficked routes in the western Atlantic.[318] Again similar to the CRD,

[313] Laffoley, above n 210, 32.
[314] Sea Education Association, above n 288, 20.
[315] Sumaila, Vats, Swartz, above n 267, 18.
[316] Laffoley, above n 210, 32.
[317] Ibid.
[318] Roberts, above n 267, 37.

vessel-source pollution poses a high risk to the conservation of the fragile ecosystems and species described above. In this regard, there is some support for the view in the academic literature that a number of hard law options should be pursued and the Sargasso Sea might be an ideal candidate for the designation of a Particularly Sensitive Sea Area by the IMO. As seen in chapter 4 of this study, this ABMT recognises areas of unique ecological, socio-economic and scientific attributes, as well as its need for special protection through IMO actions.[319] However to date, no PSSAs have been designated in ABNJ, in the Sargasso Sea or elsewhere for that matter.[320] In light of this omission, consideration ought to be given to the applicability of other instruments that advance the conservation agenda. For instance, another IMO measure that could be applicable to the Sargasso Sea is to afford it Special Area status[321] within the framework of the Convention for the Prevention of Pollution from Ships (MARPOL).[322] This would acknowledge the Sargasso Sea as a "sea area where for recognised technical reasons in relation to its oceanographic and ecological condition and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution by oil is required." [323] More specifically, two technical Annexes from MARPOL could be applied in the Sargasso Sea, namely: Annex I) Regulations for the Prevention of Pollution by Oil[324] and Annex V) Prevention of Pollution by Garbage from Ships.[325]

Due to increased shipping activities, associated environmental hazards such as accidental or intentional pollution, damage to marine habitats and ship strikes of marine mammals,[326] are the most common threats to the marine environment and its biodiversity in the Sargasso Sea. In this context, three main impacts from commercial shipping are evident: firstly, noise pollution from the vessel's engines and machinery ,[327] which generates background noise at the same frequencies as those used by marine

[319] IMO Assembly. Resolution, 1 December 2005, 3.
[320] Freestone, above n 209, 227.
[321] Ibid. 227.
[322] The Convention for the prevention of pollution from ships 1340 UNTS 184. Adopted 2 November 1973. See also: A. Tan, *Vessel Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge: Cambridge University Press, 2006), Chapter 2.
[323] International Convention for the Prevention of Pollution from Ships –MARPOL. Annex I Regulations for the Prevention of Pollution by Oil. Article 1, 10.
[324] Entered into force on 2 October 1983.
[325] Entered into force on 31 December 1988.
[326] IMO, above n 319, 4.
[327] Roberts, above n 267, 12.

animals,[328] and secondly, collisions with cetaceans, which cause physical damage to endangered specimens. Furthermore, there appears to be a link between collisions and noise pollution, since increased ambient noise diminishes cetaceans' ability to avoid collisions in high-density areas of maritime traffic.[329] Specifically in the North Atlantic region, where the Sargasso Sea is located, "international attention has been focussed on the critically endangered North Atlantic right whale, for which vessel strikes may account for over 35 per cent of total deaths."[330] Significantly, a number of important initiatives are underway including measures adopted by Contracting Parties to the Convention on the Conservation of Migratory Species of Wild Animals, which are aimed at research on the impact of underwater noise, and limiting or mitigating man-made noise,[331] this of course will help address SDG 14 Target 14.1.

Thirdly, environmental risks due to operational and accidental discharge of harmful pollutants such as sewage, oil, chemicals, marine debris and the transportation of invasive species in ballast waters are latent in the Sargasso Sea.[332] Specifically in this open-ocean ecosystem, residues of petroleum and tar have been found in *Sargassum* and its species, like crabs, snails, and post-hatchling loggerhead turtles.[333] As maritime traffic poses significant threats to the Sargasso Sea and the conservation of its associated biodiversity, further regulatory action on the part of the IMO and concerned States is clearly needed in the form of navigation routing measures.

7.3.4.4 The potential for seabed mining activities

The international seabed area is the subject of a special regime under UNCLOS and is considered the common heritage of mankind. In the seafloor beneath the Sargasso Sea,[334] there are concentrations of different seabed minerals including polymetallic

[328] Laffoley, above n 210, 35.
[329] Roberts, above n 267, 12.
[330] Ibid. See also: A. R. Knowlton, S. D. Kraus (2001) 'Mortality and serious injury of northern right whales (*Eubalaena glacialis*) in the western North Atlantic Ocean,' *Journal of Cetacean Research and Management,* 193-208.
[331] CMS. UNEP/CMS/Resolution 10.24, 20-25 November 2011. See also: CMS. UNEP/CMS/Resolution 9.19, 1-5 December 2008.
[332] Roberts, above n 267, 6.
[333] Laffoley, above n 210, 36.
[334] The Sargasso Sea encloses a broad swath of seafloor from the foot of the continental slope offshore from the eastern seaboard of North America across to the flanks of the mid-Atlantic spreading ridge system. L. Parson, R. Edwards (2011) '*The Geology of the Sargasso Sea Alliance*

sulphides, polymetallic nodules, cobalt-rich ferromanganese crusts, hydrocarbons, and gas hydrates.[335] More specifically, polymetallic sulphides are common mineral resources in the deep sea floor, and are likely to occur within the oceanic crust underlying the Sargasso Sea area.[336] At the time of writing, two contracts for the exploration of polymetallic sulphides have been granted in the Mid Atlantic Ridge to the Institut Français de recherche pour l'exploitation de la mer and the Government of the Russian Federation.[337] Also, manganese nodules and cobalt-rich manganese crusts are located in the seabed of the Sargasso Sea.[338]

Seabed mining in the Sargasso Sea is not contemplated in the near future,[339] and therefore should not be considered as an imminent threat to this open-ocean ecosystem.[340] Nonetheless, because of the concentration of minerals, mining activity is a potential activity that may arise in the future. This is the reason why the Sargasso Sea Commission has opened discussions concerning coordination arrangements with the International Seabed Authority. Moreover, it has been granted an observer status by the ISA Assembly.[341] Significantly, contemporary discussions are focused on a broad range of matters of mutual concern. These include: promoting information sharing between the two entities and using the best scientific data available in the decision-making processes, along with environmental assessments and management of the risks posed by the potential development of seabed mining activities in the Sargasso Sea.[342] Similar considerations will undoubtedly have to be taken into consideration in designing a governance and management scheme for the CRD, as will be seen in chapter 9.

7.3.4.5 Marine scientific research and bioprospection

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study area, potential non-living marine resources and an overview of the current territorial claims and coastal States interests. Washington, DC: Sargasso Sea Alliance, 3.

[335] Ibid. 7.

[336] Ibid. 8.

[337] ISA. *Deep seabed minerals contractors. Polymetallic sulphides*. Available at: https://www.isa.org.jm/deep-seabed-minerals-contractors?qt-contractors_tabs_alt=1#qt-contractors_tabs_alt

[338] Parson, Edwards, above 334, 9.

[339] Ibid. 12. See also: Freestone, above n 236, 250.

[340] Freestone, above n 209, 217.

[341] ISA. Document ISBA/21/A/INF/2, 26 May 2015.

[342] Freestone, above n 209, 217.

There are several aspects of marine scientific research (MSR, hereafter), both basic and applied, that are directly relevant to the adoption of a future governance scheme for the Sargasso Sea region. First and foremost, as noted above, there is a pressing need for further scientific understanding of the unique biodiversity, species, habitats and ecosystems associated with the Sargasso Sea.[343] Similar to other bio-geographic features associated with ocean biodiversity, the region has been the focus of scientific research programmes and been host to the world's longest continuous open-ocean time series of ocean measurements, which has allowed the observation of trends and changes over time.[344] The information acquired is vital for understanding the phenomenon of climate change and its effects on marine biodiversity and ecosystems. In particular, extensive field programmes[345] in the North Atlantic Subtropical Gyre have provided valuable insight on large-scale gradients and dominant seasonal cycles of the physical parameters of this region.[346] Surprisingly, there appears to be little information on efforts to provide a degree of international oversight in relation to the on-going scientific research programmes within the region. Moreover, scientific tourism is also a valuable source of income for the island, where science and research is currently estimated to be worth $2.3 million per year.[347] In regards to bioprospection, again the literature is relatively sparse on the range of activities undertaken in the Sargasso Sea. However, this activity will have to be considered in future management and conservation actions in the future, as an increasing interest in access to marine genetic resources and the sharing of benefits have started to be actively discussed throughout international forums, such as the BBNJ negotiation process that will be addressed in detail on chapter 8.

7.3.4.6 Forging cable industry consensus on the impacts of electronic superhighways

As seen in chapter 3 of this study, all States have the right to lay seabed cables and

[343] See: UNESCO (2017) *Global Ocean Science Report: The Current Status of Ocean Science around the World – Executive Summary*. Paris: UNESCO.
[344] Including warming of the surface ocean, an increase in salinity and a decrease in surface pH. Sargasso Sea Commission, above n 221, 2.
[345] Some of these field programmes are the following: MODE, POLYMODE, FASINEX, GEOSECS, BIOWATT, TTO, WOCE, CLIMODE, ARGO, JGOFS, BATS and Hydrostation 'S'. Ibid.
[346] Lomas, Bates, Buck, Knap, above n 211, 6.
[347] Hallett, above n 267, 11.

pipelines on the high seas beyond the continental shelf, but must have due regard to cables and pipelines already in position.[348] This provision is significant to the submarine cable industry, given that nowadays submarine fiber-optic cables provide over 97% of worldwide international communications.[349] The Sargasso Sea is a crucial crossroads in so far as eight international cable systems encompassing eleven submarine cables transit through this open-ocean area.[350] Discussions have been taking place between the Sargasso Sea Commission and the industry in relation to submarine cables and the possible impacts of their laying and maintenance in the Sargasso Sea seabed.[351] Specifically, the Sargasso Sea Commission, the Washington University Law School, the International Cable Protection Committee (ICPC, hereafter)[352] and the Centre for International Law at the National University of Singapore organised the workshop 'Submarine Cables in the Sargasso Sea – Legal and Environmental Issues Beyond National Jurisdiction.' The workshop was aimed at improving dialogue between the submarine cable industry and the Sargasso Sea Commission regarding the exchange of information[353] and best environmental and industry practices for the surveying of cable routes and the laying, repair and maintenance of cables in the Sargasso Sea.[354] This approach has been constructive even though neither the ICPC nor the Sargasso Sea Commission has international legal mandates to conclude binding agreements on the subject matter.[355] Notably, government representatives, scientists, the cable industry and academics identified different ways to foster collaboration on a broad range of matters including: a) agreement on best environmental and industry practices for cable operations in the Sargasso Sea; b) continuing cooperation between the ICPC and the Sargasso Sea Commission on areas of mutual concern and interest

[348] UNCLOS. Article 79(5), 112. See also on submarine cables: D. Burnett, B. Beckman, T. Davenport, *Submarine Cables: The Handbook of Law and Policy* (Leiden/Boston: Brill/Nijhoff, 2015), 63.
[349] D. Freestone, D. Burnett, A. de Juvigny, T. Davenport (2015) 'Submarine Telecommunication Cables in the Sargasso Sea,' *The International Journal of Marine and Coastal Law*, Vol. 30(2), 372.
[350] Ibid. 375. The last cable installation in the Sargasso Sea area dates from 2002, and no new cable is planned in the near future.
[351] Ibid. 371.
[352] Ibid. 372. The ICPC was established in 1958 and currently has 146 members from 64 countries, representing 98% of the international telecommunication cable systems in the world.
[353] Ibid. 376. Cable route studies and marine surveys before a cable is laid already provide extensive environmental data on each cable project. The cable industry offered to share surveys confidentially with the Sargasso Sea Commission for its review and study.
[354] D. Burnett, D. Freestone, T. Davenport (2015) *Submarine cables in the Sargasso Sea: legal and environmental issues in areas beyond national jurisdiction*. Washington, DC: ICPC/ Sargasso Sea Commission/ George Washington University Law School/ National University of Singapore. See also: Freestone, Burnett, Juvigny, Davenport, above 349, 371-378.
[355] Ibid. 377.

reflected under a Memorandum of Understanding or an ICPC Recommendation, c) the identification of environmentally sensitive areas in the Sargasso Sea for dissemination and awareness of the cable industry; d) participation in relevant meetings to foster a continuous exchange of views and information; and e) possible use of environmental sensors on submarine cables in the Sargasso Sea for environmental monitoring and data collection purposes, among other matters.[356]

Undoubtedly, efforts to forge consensus between the cable industry and the Sargasso Sea Commission sets an important international precedent in relation to non-regulatory approaches to management and governance, which could be replicated in the CRD.

Moreover, apart from being stakeholder led, the discussions also highlighted areas of contention including the view held by the cable industry that the laying of cables on the deep ocean floor does not cause significant and harmful changes to the marine environment.[357] The industry is reluctant to accept further requirements and restrictions, such as EIAs for cable laying operations in the Sargasso Sea. As noted previously, such a requirement is not legally mandatory and not considered to fall within the scope of article 206 of UNCLOS.[358] Nevertheless, the industry seems to be willing to continue to engage in further discussions on this particularly sensitive issue.[359] The importance of this approach is all the more significant in the absence of specific regulatory requirements that are applicable to non-State entities such as the cable industry.

7.3.4.7 Other risks to the conservation of biodiversity

Apart from the risks outlined above stemming from overfishing and shipping traffic, there are several other threats to the conservation of biodiversity associated with the Sargasso Sea. Three specific threats are mentioned very briefly below, namely: the accumulation of plastic and other pollutants;[360] the harvest of *Sargassum* seaweed for commercial-scale extraction and other innovative activities; and the effects of climate change and ocean acidification.[361] All of these impacts threaten the long-term

[356] Burnett, Freestone, Davenport, above n 354, 3-5.
[357] Freestone, Burnett, Juvigny, Davenport, above n 349, 376.
[358] Chapter 3, ante.
[359] Burnett, Freestone, Davenport, above n 354, 4, 21.
[360] Freestone, above n 210, 10. See also: Laffoley, above n 210, 33.
[361] Ibid. 37.

sustainability and health of the biodiversity associated with unique ecosystem found in the Sargasso Sea.

First and foremost is the occurrence of marine debris due to the singular oceanographic features of the eddies, rotating gyres and marine currents that define the boundaries of the Sargasso Sea, which have a collateral effect as well, collecting pollutants that remain trapped in the area for a long time.[362] Floating plastics were reported in the Sargasso Sea since 1972, and currently the North Atlantic garbage patch of accumulated plastic is having significant biological consequences and is expediting the spread of contaminants and invasive species.[363] There are some estimates that indicate that the concentration of plastic particles taken from plankton in the western North Atlantic Ocean have reached in excess of an equivalent of 200,000 pieces km^2.[364] Therefore, the presence of plastic pollution and high levels of persistent organic pollutants in the Sargasso Sea adds another level of risk if they are ingested by marine species, which may be also become entangled in plastic debris leading to choking and strangulation.[365] Plastic pollution was identified by UNGA Resolution 71/257[366] as one of the four major contemporary environmental risks and was also highlighted by UNEP General Assembly Resolution 2/11 on marine debris and microplastics in May 2016.[367] Although plastic pollution does not come within the scope of the BBNJ negotiations, a new coordination mechanism for international bodies under a putative implementing agreement could ensure greater political awareness of plastic pollution in the high seas and facilitate regional solutions, as well as the adoption of coastal State waste management measures.

The second threat is the commercial extraction of seaweed for use as fertilizers and cattle feed in Bermuda. The commercial extraction of *Sargassum* algae both within and beyond national jurisdiction may be a potential threat to the integrity of the Sargasso Sea ecosystem. Industrial, medical and nutritional uses of *Sargassum* have also been proposed, including applications as antibiotic, antifungal and antifouling substances,

[362] Ibid.
[363] Ibid.
[364] K. Law, et. al. (2010) 'Plastic accumulation in the North Atlantic Subtropical Gyre,' *Science*, Vol. 329, 1186.
[365] Laffoley, above n 210, 37.
[366] UNGA Resolution A/RES/71/257, 20 February 2017.
[367] UNEP Resolution UNEP/EA.2/Res.11, 23 May 2016.

and as a biofuel raw material.[368] With this in mind, new uses of *Sargassum* weed could radically increase pressures for large-scale exploitation and harvesting, putting at risk the integrity and functionality of the Sargasso Sea.[369]

The third threat is ubiquitous in all ocean regions, which is the effects of climate change and ocean acidification more specifically. There is considerable scientific evidence which demonstrates that the Sargasso Sea provides a valuable ecosystem service to the international community by means of carbon sequestration.[370] For example, due to the large presence of picoplankton in the Sargasso Sea, its annual net primary production is surprisingly high, playing a key role in the sequestration of carbon.[371] In addition, the carbon dioxide time series in the Sargasso Sea have shown significant warming of the surface ocean, the reorganisation of global hydrological cycle shown by an increase of the ocean salinity,[372] as well as evidence of ocean acidification in the North-Western ocean area, and suggest that the Sargasso Sea is a critical location for understanding global ocean acidification and its consequences at both regional and global levels.[373] Significantly, in light of the scientific findings of the Fifth IPCC Climate Change Assessment, the unique oceanographic singularities present in the Sargasso Sea, such as the marine upwelling, may be impacted by climate change,[374] affecting consequently the species that depend on it, as well as the fishery and tourism industries that benefit from the Sargasso Sea.

7.3.5 Sargasso Sea and the BBNJ Agreement

The following paragraphs will outline briefly the links between the Sargasso Sea governance regime and the particular elements under discussion in the BBNJ negotiation process. The Sargasso Sea has been designated as an EBSA,[375] thus receiving recognition by the international community on the basis of its unique ecological and biological features. Even though the EBSA process is clearly a science-

[368] Laffoley, above n 210, 37.
[369] Ibid.
[370] Laffoley, above n 210, 27.
[371] Sargasso Sea Commission, above n 221, 2.
[372] Freestone, above n 209, 241.
[373] Laffoley, above n 210, 29. See also: Freestone, above n 209, 241.
[374] Rhein, above n 91, 7.
[375] CBD, above n 216. See also: Freestone, above n 209, 13.

driven process,[376] this designation could lead to the adoption of area-based management tools, including MPAs, as well as to further conservation and management measures. This in turn could be complemented by sectoral measures pursuant to specific regulatory schemes and treaties that regulate specific activities in the Sargasso Sea, such as fisheries, navigation or seabed mining. In the interim, while the BBNJ Agreement is under negotiation, concerned governments and stakeholders could build stronger partnerships with international organisations, scientists, agencies and civil society to develop innovative ways to improve conservation in ABNJ. The Bermuda Government, which has worked steadfastly to guide other States in such initiatives, provides a positive example.

On the specific elements under negotiation during the BBNJ process, it is pertinent to note that Annex II of the Hamilton Declaration includes a reference on EIAs and SEAs.[377] More specifically, it gives a mandate to the Sargasso Sea Commission to cooperate with national governments as well as regional and international organisations with relevant competences in the development of EIAs, SEAs and equivalent instruments. Likewise, the Sargasso Sea Stewardship Plan includes references on EIAs in relation to fishing activities,[378] and calls for the development of guidelines for voluntary EIAs beyond those required by international law.[379] This Plan also seeks to encourage and facilitate the preparation of cumulative EIAs for the Sargasso Sea area[380] and to promote the application of a biodiversity framework for preparation of EIAs.[381] The Sargasso Sea initiative has not yet developed any provisions In relation to the other two elements of the package under discussion in the BBNJ negotiation process, namely: marine genetic resources and capacity building and technology transfer. However, it must be highlighted that the conclusion of a robust BBNJ Agreement will certainly positively impact the regional initiatives in place or the ones emerging through out the globe, such as the Sargasso Sea and the CRD initiatives.

7.3.6 Replicating lessons from the Sargasso Sea initiative in the CRD

[376] Freestone, above n 209, 244.
[377] Hamilton Declaration. Para (j). Annex II.
[378] Sargasso Sea Commission, above n 221, 11.
[379] Ibid.
[380] Ibid.
[381] Ibid. 12.

There are lessons that can be derived from the approach adopted by the Sargasso Sea project that may be replicated and applied with a view to establishing a conservation regime in the ABNJ of the CRD. Three specific particular features catch the eye.

The first relates to the cooperation and coordination mechanisms with international bodies. As seen above, the existing options of ABMTs are still "essentially mono-sectoral and designed to protect from specific sectoral threats."[382] That said, one of the major lessons derived from the Sargasso Sea project has been the tenacious pursuit of effective coordination and efficient cooperation with competent organisations in that specific ocean region. Nevertheless, the path has been slow and complex, making it clear that coordination with sectoral organisations one by one is arduous, challenging and problematic. This has been summarised in the words of the Sargasso Sea Commission as follows:

> Despite the plethora of international organisations with an interest in ABNJ, there are only a handful with actual management competence in the Sargasso Sea area and none with a core focus on comprehensive conservation of marine biodiversity or ecosystems (…) What we have learned is that the lack of common principles, common criteria and common evidentiary standards for conservation measures has hindered broader efforts for comprehensive management.[383]

At the time of writing, the Sargasso Sea Commission has been working with sectoral organisations for six years with a view to advancing regional governance and management arrangements. This has succeeded in bringing attention and recognition from the international community to this unique open–ocean ecosystem. So far the closure of several seamounts to deep sea bottom fishing by NAFO is the only legally binding protective measure in place.[384] Moreover, given that each sectoral organisation has developed their own regime, the result in the Sargasso Sea and in the rest of the ABNJ globally, is a patchwork of sectoral area-based management tools, developed and assessed with different criteria, lacking coordination mechanisms between the various sectors, and with no mechanism for consideration of cumulative impacts from different

[382] Freestone, above n 236, 237.
[383] Sargasso Sea Commission, above n 217, 1.
[384] Ibid.

sectors.[385] Aggravating the overall situation, the Sargasso Sea Commission has shown important findings regarding the complex and tangled structure of these organisations. For example, key environmental principles, such as the ecosystem approach and the precautionary approach, have a challenging road ahead within sectoral organisations and little progress has been achieved. The Sargasso Sea Commission has pointed out that, "ICCAT has declined to follow the advice of its ecosystem Sub-Committee that the Sargasso Sea be used as a case study for an ecosystem-based approach to fisheries management."[386] Furthermore, within the PSSA-IMO framework, it appears to be a defiant interpretation on the precautionary approach due to some influential delegations in IMO, which require evidence on how international shipping activities are causing damage to the marine environment,[387] and by that, contradicting the very conceptual nature of this principle. Consequently, the Sargasso Sea initiative demonstrates a compelling argument for the adoption of a global, integral and comprehensive framework to improve the conservation and sustainable use of marine biodiversity in ABNJ.

The second feature of note is that the Hamilton Declaration includes a general provision on the establishment of a financial mechanism including the establishment of a trust fund, which will allow the reception of voluntary contributions from both public and private sources, with the view to support activities related to the Declaration objectives, as well as the work of the Commission and the Secretariat.[388] A similar provision could be considered in a putative regime for the CRD to secure the financial sustainability of the initiative and the established institutional arrangements.

The third feature is the measures focused on the improvement of knowledge, monitoring and reporting. In this context, it is significant that the Hamilton Declaration provides a mandate for the Sargasso Sea Commission to develop and exchange data, share databases and collect data in standardised formats.[389]

7.3.7 Appraisal of the push towards a sui generis regime for the Sargasso Sea

[385] Ibid. 2.
[386] Ibid.
[387] Ibid.
[388] Hamilton Declaration. Para. 9.
[389] Ibid. Annex II.

The legal regime applicable to the Sargasso Sea is evolving slowly from an "out of sight out of mind" approach to ABNJ biodiversity conservation towards the adoption of more coherent regulatory arrangements. Moreover, in addressing the progressive development of the law in this regard, and in answering the three research questions posed above, it is evident from the analysis undertaken in this case study that the development of *sui generis* regional governance arrangements for the Sargasso Sea raises significant issues that are right at the interface of science, policy and law. As seen, the Sargasso Sea ecosystem receives specific attention in the first Global Ocean Assessment, [390] which highlights its significance as a biodiversity hotspot with oceanographic features and ecological properties hosting incredible forms of marine life including the only spawning ground of the iconic and endangered species of European and American eel. However, the Sargasso Sea and its associated biodiversity are under pressures and threats, mainly due to commercial shipping, overfishing from intensive fishing industries, pollution, commercial extraction of *Sargassum,* the effects of climate change and ocean acidification. This leads directly to a regulatory and governance conundrum noted by Professor Freestone in so far as managing large-scale areas poses unique challenges, since these areas "encompass diverse set of mobile species and dynamic oceanographic features."[391] The latter observation is also entirely true in relation to the CRD, as seen in chapter 2, and important lessons can thus be derived from this comparative case study. Moreover, when viewed objectively, it is evident that within a relatively short time and due to sustained engagement by a highly motivated and well organised stakeholders, including public and private entities under the leadership of the Sargasso Sea Commission, there have been significant advancements on biodiversity protection. Accordingly, from the perspective of the hypothesis advanced in this thesis, some of the key attributes of Sargasso Sea case study merit a number of final comments here.

Firstly, the Sargasso Sea initiative has resulted in the adoption of specific measures under UNCLOS and related instruments and through the constructive use of sectoral, regional and multilateral bodies. That said, none of these bodies has a specific mandate

[390] The First Global Integrated Marine Assessment, also known as the World Ocean Assessment I, was approved by the United Nations General Assembly (hereafter, UNGA) in December 2015 (See UNGA Resolution 70/235, para. 266), and a programme of work (2017-2020) for the second cycle of the Regular Process for the Global Reporting and Assessment of the state of the marine environment, including socioeconomic aspects, was adopted in 2016 by the UNGA (See UNGA Resolution 71/257, para. 299).
[391] Freestone, above n 209, 244.

for the conservation and sustainable use of biodiversity in the Sargasso Sea. In this capacity, the initiative has been successful in raising awareness to the global relevance of this open-ocean ecosystem and the importance of *sui generis* protection for regional ecosystems on the high seas. Vitally, it has been designated by the Contracting Parties of the CBD as an EBSA with the northern seamounts forming part of another EBSA, and it has been included as an illustration of potential outstanding universal value in the high seas, in the UNESCO Report 'World Heritage in the High Seas.'[392] In addition, the iconic species of European eel has been included in Appendix II of CMS for protection.[393] Other important regulatory measures include the designation of the New England seamount as a VME and the adoption of measures prohibiting the use of trawl fishing gear.[394] On the one hand, this proves that regional governance and regulatory initiatives can be adopted using existing treaties and institutional mechanisms. On the other hand, it must be borne in mind that the regulatory measures to date have been driven from both top-down and the bottom-up by a range of stakeholders including States, the scientific community and private donors, including most notably the Ocean Foundation. At best, the approach by reason of necessity is disjunctive and falls well short of international best practice as evident from the other regional case studies examined in this thesis.

This leads directly to the second point, a major political milestone within this regional initiative: the Hamilton Declaration, a non-legally binding political statement currently signed by 9 governments.[395] It seeks to establish effective monitoring and development of protection measures for the Sargasso Sea, as well as effective collaboration through existing regional and international organisations with relevant competencies. In this regard, Professor Freestone points out that "the work of the Sargasso Sea Commission and the signature of the Hamilton Declaration may indeed represent a new paradigm for high seas conservation."[396] A new milestone in regional governance developments is the adoption of the Sargasso Sea Stewardship Plan, a ground-breaking precedent for ABNJ globally. However, it must be acknowledged that despite the dedicated and continuous work from the Sargasso Sea Commission with several sectoral organisations, so far, only one legally binding measure is in place in the aforementioned prohibition

[392] Freestone, Laffoley, Douvere, Badman, above n 234.
[393] UNEP/CMS, above n 284.
[394] NAFO, above n 299.
[395] See above n 237, 245.
[396] Freestone, above n 236, 264.

of deep sea bottom fishing on seamounts.[397] Whether this blended approach of soft law and legally binding measures approach can be successfully applied in achieving many of the targets set down by Goal 14 of the 2030 Agenda for Sustainable Development is questionable.

The aforementioned developments raise a third point, which relates to the inter-relationship between legal regimes and the inadequacy of the flag State model for high seas conservation.[398] From the analysis above, it is evident that there is steady incremental progress towards the adoption of a more robust regional regime for the Sargasso Sea initiative. Inherent weaknesses in the current regime is its reliance on the flag State enforcement and compliance model, the absence of normative tools for the application of precautionary and ecosystem-based conservation measures, as well reliance on an approach that is exclusively based upon sector regulatory measures. In this context, the Sargasso Sea initiative is a cogent working example that proves the hypothesis advanced in this thesis that there is a pressing need for regional action and more specific regimes for unique bio-geographic features such as the CRD. Moreover, the Sargasso Sea Initiative is an evolving regime that will ultimately be shaped by the elements under negotiation for inclusion in the BBNJ Agreement. Though, as pointed out previously, some elements of the package have not been yet addressed due to the recent history of this regional initiative. In regards to EIAs and SEAs, some mandates and action lines are addressed in the Hamilton Declaration and in the Sargasso Sea Stewardship Plan. The access to marine genetic resources, as well as capacity building and technology transfer have yet to be developed in the context of a *sui generis* regime for the Sargasso Sea and the adoption of a more integrated approach building upon UNCLOS and the future BBNJ implementation agreement.

Finally, it is easy to conclude that the lessons that may be derived from the Sargasso Sea can be applied in other ocean regions, which lack a specific ocean management regime. As seen above, it shares many common features with the CRD, like its ambulatory maritime boundaries, characterised by dynamic ecosystems that provides habitats, spawning areas, migration pathways and feeding grounds for different endemic, endangered, and commercially important species. Furthermore, there is considerable scope for greater engagement with civil society due to the economic

[397] NAFO, above n 284.
[398] As noted in the introduction, *supra*.

significance of the marine resources in both regions. The most notable feature of progress in developing a *sui generis* regime is the creation of institutional arrangements and the advancement of political engagement through the Hamilton Declaration. A similar simple structure could be proposed for the management of the CRD. A major lesson that can be drawn from the Sargasso Sea initiative is that "the lack of common principles, common criteria and common evidentiary standards for conservation measures has hindered broader efforts for comprehensive management." The international legal regime for ocean governance in ABNJ is insufficient, fragmented and riddled with loopholes. Professor Freestone concludes that "the Sargasso Sea experience can be envisioned as an example what can and cannot be delivered through existing institutions in ABNJ."[399] Therefore, it is evident that the development of a global and comprehensive legally binding Implementation Agreement to address marine conservation and sustainable use of marine biodiversity in ABNJ is crucial and a major concern for States and several organisations, including most notably those concerned about the conservation and sustainable use of the unique biodiversity associated with the Sargasso Sea. As such, a recent study points out that a new international legally binding instrument "provides a critical opportunity to build on the provisions in UNCLOS and could allow for a more holistic approach to ocean governance for the Sargasso Sea and other regions in ABNJ."[400]

7.4 ADVANCING ABNJ GOVERNANCE IN LATIN AMERICA: THE PERMANENT COMMISSION FOR THE SOUTH PACIFIC

The last case study in this chapter will review the governance framework of the Permanent Commission for the South Pacific (CPPS, hereafter), which has a progressive view on conservation and management of biodiversity in ABNJ.

Following a similar line as in the previous case studies examined on this thesis, three main research issues are explored in the CPPS initiative, namely: a) the policy and legal advancements of biodiversity protection within the CPPS; b) the evolution of this regional example in relation to the elements which are under negotiation for inclusion

[399] D. Freestone, et. al. (2014) 'Can existing institutions protect biodiversity in areas beyond national jurisdiction? Experiences from two on-going processes,' *Marine Policy*, Vol. 49, 167–75.
[400] G. Wright, et. al. (2017) *Partnering for a Sustainable Ocean: The Role of Regional Ocean Governance in Implementing SDG14*. PROG: IDDRI, IASS, TMG, UN Environment, 48.

in the BBNJ Agreement; and c) what lessons can be derived and applied in the context of designing new arrangements for the Costa Rica Dome.

As a starting point, it should be emphasised that marine environments of the South American continent host a remarkable diversity of life.[401] More specifically, the South Pacific has been described as the third most productive region in the world,[402] where fish catches accounted for approximately 6.890.058 tonnes in 2014.[403] As fisheries have become one of the most profitable industries in this region, they have also been identified as the main threat to marine biodiversity.[404] Moreover, coastal and marine ecosystems in South America are impacted by multiple anthropogenic activities and uses, and additional threats have been identified in this rich and bio-diverse oceanic region, such as pollution, mineral extraction, hydrocarbon industry, aquaculture, maritime transport, tourism, invasive species, climate change[405] and the impacts of environmental variability derived from the El Niño Southern Oscillation (ENSO) phenomenon.[406] The evolution of regional regimes worldwide have addressed similar challenges,[407] and the South Pacific has been no exception.[408] As noted by Durussel, "the conjunction of global and regional organisations' efforts and collaboration is important in order to achieve better conservation and management of high seas resources and biodiversity in the South East Pacific."[409]

The structure for this purpose include most notably the Permanent Commission for the South Pacific (CPPS, hereafter), which was established in 1952 by Chile, Ecuador and Peru, within the broader framework of the Santiago Declaration,[410] with the objective of halting "illegal fishing in the region, particularly because these countries were

[401] A. Chatwin (2007) *Priorities for coastal and marine conservation in South America*. United States of America: The Nature Conservancy, 1.
[402] Ibid. 38.
[403] FAO. 2016. *The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all*. Rome, 15.
[404] Chatwin, above n 401, 3.
[405] Ibid. 4.
[406] CPPS (2012) Plan de Acción Estratégico para la CPPS del siglo XXI. Available at: http://cpps.dyndns.info/cpps-docs-web/publicaciones/PAE-CPPS-XXI.pdf, 17.
[407] Examples of regional case studies are addressed in Chapters 6 and 7 of this thesis.
[408] Ibid, 21.
[409] C. Durussel (2015). *Challenges in the conservation of high seas biodiversity in the Southeast Pacific*. Doctor of Philosophy thesis. Australian National Centre for Ocean Resources and Security (ANCORS), Faculty of Law, Humanities and Arts, University of Wollongong, 152.
[410] Santiago Declaration. 1006 UNTS 324. Entered into force on August 18, 1952.

dependent on fisheries for their livelihoods."[411] Importantly, Colombia later acceded to the CPPS in 1979,[412] increasing the geographical scope of this regional alliance. In line with the Santiago Declaration, Chile, Ecuador and Peru extended their exclusive sovereignty and jurisdiction out to 200 nautical miles of EEZ,[413] covering areas that were considered ABNJ previously. These countries affirmed that the extension of the territorial sea and the contiguous zone were inadequate for the effective conservation and exploitation of marine resources by coastal countries.[414] In the overall development of the Law of the Sea from a global perspective, the Santiago Declaration may be considered a milestone in so far as "it contributed to the development of the concept of EEZs, now codified in UNCLOS, and at the same time, it meant that ABNJ entered into the CPPS agenda at a very early stage in the history of ocean governance."[415] Crucially, within the framework of the Santiago Declaration, this group of States agreed to establish general norms to regulate and coordinate on fishing and the exploitation of natural resources of common interest within their maritime zones.[416] Later on, with the ratification of the Convention on the international legal personality of the Permanent Commission of the South Pacific[417] gave the CPPS a solid legal backdrop to operationalize its objectives and strategic action lines. Successively, CPPS member States have continuously affirmed their interest in ABNJ through multiple declarations including the Cali Declaration,[418] the Declaration of Viña del Mar,[419] the Declaration of Quito,[420] the Declaration of Lima,[421] the Declaration of Bogota,[422] and the Declaration

[411] UNEP-WCMC (2017) *Governance of areas beyond national jurisdiction for biodiversity conservation and sustainable use: Institutional arrangements and cross-sectoral cooperation in the Western Indian Ocean and the South East Pacific*. Cambridge (UK): UN Environment World Conservation Monitoring Centre, 71.
[412] CPPS Statute. Article 1.
[413] Santiago Declaration. Article 2, 4.
[414] Santiago Declaration. Article 1.
[415] UNEP-WCMC, above n 411, 72.
[416] Santiago Declaration. Article 6. This proclamation of exclusive jurisdiction and sovereignty over the 200 nautical miles EEZ triggered similar claims around the world, like the Truman Declaration, the Montevideo Declaration, among others. See: Durussel, above n 409, 153.
[417] Convention on the International Legal Personality of the Permanent Commission of the South Pacific. UNTS 1098. Entered into force on 29 July 1978.
[418] Cali Declaration, 24 January 1981, on considering the Area and its mineral resources as common heritage of mankind.
[419] Viña del Mar Declaration, 10 February 1984, on the conservation and optimal use of marine resources beyond 200 nautical miles.
[420] Declaration of Quito, 10 December 1987, on considering CPPS as the relevant regional organisation to coordinate the common interest in preserving marine resources in ABNJ.
[421] Declaration of Lima, 4 March 1993.
[422] Declaration of Bogota, 4 August 1997.

of Santiago.[423] In relation to non-living marine resources in ABNJ, the CPPS applies the Area regime and has been granted an observer status in the International Seabed Authority. [424] Furthermore, as it will be seen below, today the CPPS is an intergovernmental body that "promotes and articulates cooperation among its members and with other international bodies in maritime affairs."[425]

7.4.1 Biodiversity protection within the CPPS scope in the Southeast Pacific

Although the CPPS has no management authority, it has an advisory and consultation mandate for the conservation of the marine environment and its resources in the Southeast Pacific.[426] In addition, since its establishment, the CPPS has been gradually developing a framework for the protection of marine biodiversity, as some of its most relevant competences include the conservation of the living resources within and beyond the national jurisdiction of the CPPS States Parties, particularly straddling and highly migratory fish stocks.[427] Other activities include contributing to the progressive development of the Law of the Sea and the consolidation of regional regulations;[428] the comprehensive assessments of natural resources and fisheries;[429] and the establishment of mechanisms for political and technical coordination and cooperation to prevent, reduce and control pollution of the marine environment.[430] Taking a pragmatic view to the implementation of its functions, the CPPS has also developed five strategic action lines, focusing on the strengthening of competitiveness for sustainable development; progress in the implementation of the ecosystem approach; the strengthening of knowledge of the ocean and atmosphere interactions; the consolidation of regional strengths and the integration of a knowledge node.[431] These tasks are executed within an institutional structure formed by an Assembly, an Executive Committee, the national sections, working groups and a Secretariat.[432]

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[423] Declaration of Santiago, 14 August 2000.
[424] UNEP-WCMC, above n 411, 80. See also: https://www.isa.org.jm/observers
[425] CPPS. *History*. Available at: http://www.cpps-int.org/index.php/home/cpps-historia
[426] UNEP-WCMC, above n 411, 75.
[427] CPPS Statutes. Article 3(a).
[428] Ibid. Article 3(c).
[429] Ibid. Article 3(i).
[430] Ibid. Article 3(j).
[431] Ibid. Article 5.
[432] Ibid. Article 6.

Moreover, and in order to comply with its environmental protection duties, the CPPS became the Executive Secretariat of the South East Pacific Regional Seas Programme in 1981,[433] established through the Convention on the Protection of the Marine and Coastal Areas of the South East Pacific (Lima Convention)[434] and its associated Action Plan.[435] This Regional Seas Programme includes Panama as a member.[436] Similar to other regional seas agreements, the Lima Convention addresses measures to prevent, reduce and control pollution of the marine environment;[437] enhance cooperation in emergency situations;[438] promote joint programmes for monitoring pollution in the Southeast Pacific area, within and beyond national jurisdiction;[439] and strives for scientific and technological cooperation.[440] In addition, the Convention provisions are further developed by supplementary Protocols on combating marine pollution.[441] One of these Protocols is of particular interest to this study, namely, the Protocol for the conservation and management of protected marine and coastal areas of the Southeast Pacific.[442] This instrument recognises the need to adopt appropriate measures for the protection and preservation of fragile, vulnerable and unique ecosystems, as well as threatened species,[443] and calls for the establishment of protected areas.[444] Significantly the geographical scope of the Protocol encompasses the EEZs of the Contracting

[433] UNEP. *South East Pacific Regional Seas Programme*. Available at: http://www.unep.org/regionalseas/south-east-pacific

[434] Convention for the Protection of the Marine Environment and Coastal Areas of the Southeast Pacific (Lima Convention). 1102 UNTS 2. Entered into force on 19 May 1986. The overall objective of the Convention is to prevent, reduce and control pollution of the marine environment and coastal areas of the South- East Pacific and to ensure appropriate environmental management of natural resources (article 2). Additionally, its geographical scope covers the jurisdictional waters of member States, as well as ABNJ, up to a distance within which pollution of the high seas may affect that area (article 1).

[435] CPPS. *Action Plan for the protection of the marine environment and coastal areas of the Southeast Pacific*. Available at: http://cpps.dyndns.info/cpps-docs-web/planaccion/docs2014/publicaciones/documentos-tecnicos/TextosBasicos-4Edicion-CPPS.pdf, 147.

[436] UNEP-WCMC, above n 411, 72.

[437] Lima Convention. Article 4.

[438] Ibid. Article 6.

[439] Ibid. Article 7.

[440] Ibid. Article 10.

[441] Protocol for the protection of the Southeast Pacific against pollution from land-based sources; Complementary Protocol to the Agreement on regional cooperation in combating pollution of the Southeast Pacific by hydrocarbons and other harmful substances; and Protocol for the protection of the Southeast Pacific against radioactive contamination.

[442] CPPS. Protocol for the conservation and management of protected marine and coastal areas of the South-East Pacific (Paipa Protocol, hereafter). Adopted on 21 September 1989. Available at: http://www2.ecolex.org/server2neu.php/libcat/docs/TRE/Full/En/TRE-001085.txt

[443] Ibid. Recital 1.

[444] Ibid. Recital 3.

Parties, as well as the entire continental shelf extending beyond 200 nautical miles.[445] This particular characteristic leaves an open door for Contracting Parties to establish protected areas on their extended continental shelf where the super-adjacent water column is high seas.[446] As will be seen in chapter 9, a similar provision could be included in a putative regime for the CRD, particularly in relation to the potential extended continental shelf of Costa Rica in line with its submission to the Commission on the Limits of the Continental Shelf.[447] Additional relevant elements within this Protocol that could be replicated in the CRD Agreement include: criteria to establish MPAs;[448] the regulation of activities in MPAs (including the prohibition of mining and any activity liable to have adverse effects on species, ecosystems or biological processes); [449] measures to prevent, reduce and control pollution; [450] as well as provisions on regional cooperation and capacity building.[451]

In the context of ABNJ,[452] and with a view to increasing leverage in the existing legal instruments,[453] the CPPS adopted the Galapagos Commitment in 2012, in which State Parties committed to promote a coordinated action "regarding their interests on living and non-living resources in marine areas beyond national jurisdiction." [454] This Commitment extends its guidelines beyond the EEZs of the CPPS Member States to the

[445] Ibid. Article 1.
[446] R. Warner, *Protecting the oceans beyond national jurisdiction. Strengthening the International Law framework* (Leiden, Boston: Martinus Nijhoff, 2009), 191.
[447] UNCLOS. Article 76(4)-(6). See Preliminary information indicative of the outer limits of the continental shelf beyond 200 nautical miles submitted by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/cri2009informacion_preliminar.pdf and the reservation note made by Nicaragua in relation to the preliminary information by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/nic_re_cri_2010_en.pdf
[448] Ibid. Article 4.
[449] Ibid. Article 5.
[450] Ibid. Article 7.
[451] Ibid. Article 10.
[452] UNEP-WCMC, above n 411, 77.
[453] "In 2000 an attempt was made to adopt a Framework Agreement for the Conservation of Living Marine Resources in the high seas of the South East Pacific, with special reference to straddling and highly migratory fish populations ('the Galapagos Agreement'). The agreement provides for the adoption of fisheries management measures, such as catch quotas, and area-based management tools. At the present time, however, this agreement has not yet entered into force." UNEP-WCMC, above n 411, 72.
[454] CPPS. Galápagos Commitment for the XXI Century. VIII Meeting of Ministers of Foreign Affairs. Galápagos, Ecuador, 17 August 2012. Para. 20. See: G. Wright, J. Rochette, E. Druel, 'Marine protected areas in areas beyond national jurisdiction' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 285.

ABNJ in the East Pacific basin.[455] Furthermore, within this instrument, the CPPS Parties reiterated the need for a joint and dynamic regional action in international negotiations for the development of the Law of the Sea including participation in the BBNJ negotiation process.[456] The agenda set out by the Commitment is expansive and ambitious. It includes the establishment of alliances to develop joint projects and exchange of experiences on maritime issues;[457] collaboration on integrated scientific research programs of the marine environment within and beyond national jurisdiction; [458] tackling pollution of the marine environment; [459] promoting the conservation and non-lethal use of whales in international forums;[460] creating new MPAs and consolidating a Regional network of marine and coastal protected areas of the Southeast Pacific;[461] along with the adoption and support of the Plan of Action for the Protection of the Marine Environment and Coastal Areas of the Southeast Pacific;[462] among other measures. Thus, despite the lack of a mandate to implement a specific ABNJ initiative or area-based planning[463] in ABJN, the Galapagos Commitment allows the CPPS to work on ABNJ-related matters,[464] giving it a key role in strengthening cross-sectoral collaboration in ABNJ in the future, due to its advisory competences. [465]

More recently, and with the intent to strengthen and consolidate coordination actions between Member States on pressing conservation and management topics, the CPPS Assembly has established different working groups to examine ABNJ related topics including: the working group to consider questions concerning the conservation and sustainable use of biodiversity and marine genetic resources in ABNJ;[466] the working group for the sustainable management of fisheries and the conservation of biodiversity of deep waters and ecosystems in ABNJ;[467] and the working group on the integrated Regional Ocean Policy, with the objective to identify areas of common interest among the CPPS members and develop a regional vision in relation to ocean policy, including

[455] Galapagos Declaration. Para. 1.
[456] Ibid. Para. 7.
[457] Ibid. Para. 19.
[458] Ibid. Para. 21.
[459] Ibid. Para. 23, 24.
[460] Ibid. Para. 26.
[461] Ibid. Para. 29.
[462] Ibid. Para. 2, 22.
[463] UNEP-WCMC, above n 411, 90.
[464] Ibid. 80.
[465] Ibid.
[466] CPPS. *Working Groups*. Available at: http://www.cpps-int.org/cpps-docs/gt/GT-B-RGM/TDR-GT-CPPS-B-RGM.pdf
[467] Ibid.

ABNJ.[468] Likewise, the CPPS participates in the United Nations Regular Process for global reporting and assessment of the state of the marine environment, including socioeconomic aspects.[469] One of the key regional initiatives is the project entitled STRONG High Seas, which focuses on the Southeast Pacific and the Southeast Atlantic, which is led by the Partnership for Regional Ocean Governance (PROG), and aimed at strengthening regional ocean governance for the conservation and sustainable use of marine biodiversity in ABNJ.[470]

On fisheries management, the CPPS State Parties interact with two RFMOs, namely: the Inter-American Tropical Tuna Commission (IATTC), of which Chile is a non-Party,[471] and the South Pacific Regional Fisheries Management Organisation (SPRFMO), established by the Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean.[472] Members from the latter include Peru, Chile and Ecuador, with Colombia and Panama as cooperating non-Contracting Parties.[473] Finally, in relation to sharing of information and experiences, which is one of the CPPS main functions, some of its members have traditionally been reticent about sharing fisheries information.[474] Nonetheless, in strengthening collaboration mechanisms with RFMOs, the CPPS could act as a "scientific platform for SPRFMO and IATTC, to ensure that environmental and climatic data are complementary and necessary to fisheries management and biodiversity conservation."[475]

7.4.2 Interrelations between the CPPS framework and the BBNJ negotiation process

[468] CPPS. Resolution CPPS/AO/XII/No3/2015, 25 November 2015.
[469] United Nations Division for Ocean Affairs and the Law of the Sea. *A Regular Process for global reporting and assessment of the State of the marine environment, including socioeconomic aspects*. Available at: http://www.un.org/depts/los/global_reporting/global_reporting.htm
[470] PROG (2017) *Strong high seas – IKI project launched at UN Ocean Conference*. Available at: http://www.prog-ocean.org/strong-high-seas-iki-project-launched-at-un-ocean-conference/#more-275
[471] IATTC. *Members*. Available at: https://www.iattc.org/HomeENG.htm
[472] Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean. Entered into force on 24 August 2012.
[473] UNEP-WCMC, above n 411, 72. See also: South Pacific Regional Fisheries Management Organisation. *Participation*. Available at: https://www.sprfmo.int/about/participation/
[474] UNEP-WCMC, above n 411, 81.
[475] Ibid. 80.

There are four obvious points of convergence. As will be seen, one of the key elements within the BBNJ negotiation process, as part of the package deal, is the environmental impact assessment (EIA, hereafter). Within the Lima Convention, EIA provisions have been established for the CPPS Parties including technical guidelines to assist the planning of projects to minimize their harmful impact in the sphere of application of the Convention [476] which encompass ABNJ. [477] Moreover, the Protocol for the conservation and management of protected marine and coastal areas of the South-East Pacific stipulates that Parties must assess the environmental impact of any activity liable to produce adverse effects on protected areas; establish an integrated analysis procedure; as well as exchange information on alternative activities or measures for preventing such effects. [478]

A second element subject of negotiation under the BBNJ process is area-based management tools, which includes MPAs. The CPPS does not have a specific mandate to implement area-based planning in ABJN,[479] however, in the CPPS geographical area, fifteen EBSAs have been identified,[480] including six that are located in ABNJ, namely: Salas y Gómez and Nazca Ridges;[481] Equatorial Front and Carnegie Ridge;[482] Equatorial High-Productivity Zone;[483] an area of the Eastern Tropical Pacific Marine Corridor;[484] an area of the Galápagos Archipelago and Western Prolongation;[485] and the Grey Petrel Feeding Area in the South-East Pacific Rise.[486] Notably, a number of these EBSAs are high productivity areas of upwelling systems, similar to the oceanographic features that take place in the CRD.[487] Thus, should a BBNJ Treaty be concluded in the near future, these EBSAs could form the backbone of visionary processes to establish MPAs in ABNJ

[476] Lima Convention. Article 8. Para 1.
[477] Ibid. Article 1.
[478] Paipa Protocol. Article 8.
[479] See n 455.
[480] CBD (2017) *EBSAs Regions Eastern Tropical and Temperate Pacific*. Available at: https://www.cbd.int/ebsa/ebsas
[481] CBD (2017) *Salas y Gómez and Nazca ridges*. Available at: https://chm.cbd.int/database/record?documentID=204100
[482] CBD (2017) *Equatorial front and Carnegie ridge*. Available at: https://chm.cbd.int/database/record?documentID=204048
[483] CBD (2017) *Equatorial high-productivity zone*. Available at: https://chm.cbd.int/database/record?documentID=204046
[484] CBD (2017) *Eastern Tropical Pacific Marine Corridor*. Available at: https://chm.cbd.int/database/record?documentID=204045
[485] Marine Conservation Institute (2017) *MPAtlas*. Seattle, WA. Available at: http://mpatlas.org/map/high-seas-protections/
[486] CDB (2017) *Grey petrel feeding area in the South-East Pacific Rise*. Available at: https://chm.cbd.int/database/record?documentID=204074
[487] Chapter 2, *ante*.

in the Southeast Pacific. Furthermore, the CPPS could play a key role in the coordination of conservation and management actions within the regional framework. Other ABMTs from "intergovernmental institutions for seabed mining (ISA), shipping (IMO) and conservation and management of whales (IWC), have not yet been implemented in the South East Pacific ABNJ."[488]

A third element within the package deal to be negotiated in the BBNJ process is capacity building and technology transfer. In this matter, the CPPS works on the strengthening of marine scientific research and the capacity of technical and scientific personnel of Member States.[489] It also fosters research activities, including the coordination of the El Niño Regional Research Program (ERFEN),[490] and is engaged in capacity building at the national and regional levels on marine environmental issues.[491] The CPPS is involved with SPRFMO and other partners in the implementation of the GEF project: Sustainable fisheries management and biodiversity conservation of deep-sea living marine resources and ecosystems in ABNJ, which seeks to enable capacity building to assess the status of deep-sea fisheries and the conservation status of VMEs in adjacent areas outside the national jurisdiction of CPPS State Parties.[492]

Fourthly, on crosscutting issues, more specifically on guiding principles, the CPPS has a clear mandate to apply the ecosystem approach as well as the precautionary principle in the pursuit of sustainable development of its State Parties.[493] The ecosystem approach has been identified as the cornerstone in the coordinated actions of the CPPS.[494] According to the regional interpretation, "the ecosystem approach would be considered successfully achieved if it maintains or increases the capacity of an ecosystem to produce the desired benefits, and increases the capacity of society to equitably distribute the associated benefits and costs."[495] Instructively, one of the tasks of the

[488] UNEP-WCMC, above n 411, 92.
[489] CPPS Statutes. Article 3(l).
[490] UNEP-WCMC, above n 411, 75.
[491] Ibid.
[492] CPPS. First meeting of the Working Group on Sustainable Fisheries and Conservation of Biodiversity of the CPPS. Available at: http://www.cpps-int.org/cpps-docs/gt/GT-PSCB/2013/ago/informe-i-videoconf.pdf. See also: FAO (2017) *Sustainable fisheries management and biodiversity conservation of deep-sea living marine resources and ecosystems in the ABNJ.* Available at: http://www.fao.org/in-action/commonoceans/projects/deep-seas-biodiversity/en/
[493] CPPS Statutes. Article 2.
[494] CPPS, above n 406, 5.
[495] Ibid.

CPPS is to propose long-term strategic guidelines, taking in consideration the ecosystem-based approach, and protect ecosystem services for the benefit of the Member States and the marine environment.[496]

In addition, the principle of cooperation has been present in the modus operandi of the CPPS since its establishment as a regional cooperation mechanism with the main objective to protect the maritime interests of its member countries.[497] In this regard, the CPPS main mechanism for collaboration are cooperation agreements, including arrangements with the Economic Commission for Latin America and the Caribbean on marine resources and regional development;[498] FAO on fisheries planning and research on living marine resources;[499] and the State Oceanic Administration from China on oceanic activities undertaken in the Pacific basin.[500] Additionally, CPPS has signed a Memoradum of Understanding with CBD,[501] and the Inter-American Tropical Tuna Commission[502] among others. However, cross-sectoral collaboration has not been fully developed in the Southeast Pacific, according to the CPPS Secretariat.[503]

Finally, in relation to liability and compensation, the Lima Convention calls for Parties to adopt procedures for determining civil liability and compensation for damage resulting from pollution of the marine environment caused by natural or juridical persons under their jurisdiction, as well as to ensure appropriate mechanisms within their legal systems.[504]

7.4.3 Lessons from the Southeast Pacific for the Central American region: What should be replicated in the CRD?

[496] Ibid. 2.
[497] UNEP-WCMC, above n 411, 78.
[498] Cooperation Agreement between CPPS and ECLAC/UNDP. Available at: http://cpps.dyndns.info/consulta/documentos/legal/cooperacion/2.AC.CPPS-CEPAL-PNUD-1983.pdf
[499] Cooperation Agreement between CPPS and FAO. Available at: http://cpps.dyndns.info/consulta/documentos/legal/cooperacion/3.AC.CPPS-FAO-1985.pdf
[500] UNEP-WCMC, above n 411, 79.
[501] MoU between CPPS and CBD Secretariat. Available at https://www.cbd.int/doc/agreements/agmt-cpps-1998-06-03-moc-en.pdf
[502] MoU between CPPS and IATTC. Available at: http://www.iattc.org/PDFFiles2/CPPS-IATTC-MOU-Jun-2015.pdf
[503] UNEP-WCMC, above n 411, 80.
[504] Lima Convention. Article 11.

The unique ecosystems and species in the Southeast Pacific demand effective and coordinated management actions. Consequently, the CPPS has advanced a co-responsibility scheme with a view to harmonising interactions between the three pillars of sustainable development, namely: economy, environment and society.[505] With this in mind, a putative scheme for the CRD could consider replicating some important elements already developed by the CPPS.

Firstly, CPPS has established crucial long-term objectives, namely: "competitive States in the international arena, science-based decision making, States and society as vectors of change, informed and conscious society on the environment."[506] Similar objectives to guide conservation and management measures could be included in a CRD Agreement.

Secondly, and implementing one of the long-term objectives indicated above, the CPPS has established different groups of experts to promote science-based decision-making processes. For example, a group for the prevention and deterrence of IUU fishing has convened multiple workshops and meetings to promote the State Port Measures provisions and action lines.[507] A Technical Coordination Committee for Sharks has been created with the objective to advise CPPS in the implementation of a Regional Action Plan for the conservation and management of sharks, rays and chimaeras in the Southeast Pacific Region (PAR-Tiburon).[508] In relation to non-living resources in ABNJ, the CPPS holds an observer status in the ISA, as seen previously in this section, and therefore it follows the mining discussions in this international forum, with the view to continue developing policies and decisions regarding best practices for the use of marine resources that are the common heritage of mankind.[509] On building capacities and knowledge, the CPPS has a regional oceanographic cruise programme which undertakes marine scientific research and the corresponding sharing of information.[510]

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[505] CPPS, above n 406, 3.
[506] Ibid. 14.
[507] CPPS. *IUU fishing*. Available at: http://www.cpps-int.org/index.php/pesca-indnr
[508] CPPS. *Technical coordination committee for sharks*. Available at: http://www.cpps-int.org/index.php/ctc-par
[509] F. Armas Pfirter (2013) *State of the legislation relating to seabed mining: Its application to the Southeast Pacific, including proposals to promote the adoption of regional measures on oceanic mining*. Ecuador: CPPS, 53.
[510] CPPS. *Regional oceanographic cruise programme*. Available at: http://cpps-int.org/index.php/crucero-inicio. This Programme has developed a Protocol for the use of sea-bird CTD and data processing in the South Pacific to standardise the procedures for the

In addition, since 1974, the CPPS established the Programme for the regional study of the El Niño phenomenon in the Southeast Pacific (ERFEN), to apply scientific results in decision-making processes, with an interdisciplinary and multinational view from more than 22 scientific institutions collaborating to build capacity and contribute to the mitigation of harmful effects from El Niño phenomena.[511] Likewise, in relation to climate change, the CPPS has established a GOOS (Global Ocean Observing System) regional alliance for the Southeast Pacific, contributing to monitor the ocean and the atmosphere and attending national and regional priorities.[512]

In summary, much of the work of the CPPS is implemented through technical working groups. Moreover, the experiences of these groups enhance cooperation and coordination objectives and action lines of existing programmes in the Central American region.[513] Clearly, this approach could be complemented by a fit-for-purpose new scheme for the CRD.

7.4.4 Appraisal of the regional framework of CPPS and its advancements

First and foremost, since its establishment more than sixty years ago, the CPPS has recognised the significance of the conservation and sustainable use of biodiversity and non-living marine resources in ABNJ. The duty to cooperate[514] and the duty to conserve high seas marine living resources[515] under international law has informed the CPPS working agenda ever since and these guiding principles have permeated the marine agenda in the Southeast Pacific, even though some of its member States, such as Peru, are not Parties to UNCLOS.

Addressing the first research question posed above, the CPPS has advanced a coherent approach to ABNJ biodiversity conservation and the adoption of more coherent regulatory arrangements at a regional and national level. Through the Santiago

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operation of the equipment and processing of the collected data. CPPS (2015) *Protocol for the use of sea-bird CTD and data processing in the South Pacific*. Ecuador: CPPS, 2.

[511] CPPS. *Regional Scientific Committee for the regional study of the El Niño phenomenon in the Southeast Pacific*. Available at: http://www.cpps-int.org/index.php/sobre-erfen

[512] CPPS. *GOOS regional alliance for the Southeast Pacific*. Available at: http://www.cpps-int.org/index.php/grasp-contactos

[513] Chapter 5, *ante*.

[514] UNCLOS. Article 197.

[515] Ibid. Article 237.

Declaration, State Parties established the general framework to regulate and coordinate on fishing and the exploitation of natural resources of common interest. In this context, one of CPPS' most relevant competences includes the conservation of living resources within and beyond national jurisdiction. Moreover, as seen, its member States have continuously affirmed their interest in ABNJ and have gradually developed a framework for the protection of marine biodiversity in such areas. Furthermore, in order to comply with its environmental protection duties, the CPPS became the Executive Secretariat of the South East Pacific Regional Seas Programme,[516] promoting the implementation of the Lima Convention, its subsequent Protocols, and the Plan of Action for the Protection of the Marine Environment and Coastal Areas of the Southeast Pacific. Within this regional seas framework, it is notable from the perspective of this thesis that the Protocol for the conservation and management of protected marine and coastal areas of the Southeast Pacific calls for the protection of vulnerable and unique ecosystems and its associated species through the establishment of protected areas.[517] An important feature is included in the geographical scope of this Protocol, which encompasses the EEZs of the Contracting Parties and the entire continental shelf extending beyond their 200 nautical miles,[518] allowing for the creation of protected areas on the super-adjacent water column in the high seas area.[519] More recently, the Galapagos Commitment allows the CPPS to work on ABNJ-related matters,[520] promoting and strengthening cross-sectoral collaboration in ABNJ through the CPPS advisory competences. Finally, with the view to strengthen and consolidate coordination actions between member States on urgent conservation and management topics, the establishment of working groups to examine ABNJ related topics has been another valuable feature developed by the CPPS Assembly.

In relation to the second research question, specifically on the evolution of this regional initiative in relation to the elements that are under negotiation for inclusion in the BBNJ Agreement, the CPPS has made considerable progress on environmental impact assessment, as well as area-based management tools (although the CPPS does not have

[516] UNEP. *South East Pacific Regional Seas Programme*. Available at: http://www.unep.org/regionalseas/south-east-pacific
[517] Ibid. Recital 3.
[518] Ibid. Article 1.
[519] Warner, above n 446, 191.
[520] UNEP-WCMC, above n 411, 80.

specific mandates to implement area-based planning in ABNJ).[521] In relation to capacity building and technology transfer, the CPPS promotes the strengthening of marine scientific research and capacity building of technicians and scientists from member States.[522] It also fosters research activities and participates in global and regional projects for the conservation of biodiversity in ABNJ to ensure that environmental and climatic data is available for decision-making processes.[523] Notably, CPPS has concluded collaboration agreements with the Economic Commission for Latin America and the Caribbean;[524] FAO;[525] State Oceanic Administration from China;[526] CBD;[527] and the IATTC,[528] among others. However, cross-sectoral collaboration is still a challenge and has not been fully developed in the South East Pacific.[529]

Lastly, some lessons can be derived from the CPPS experience and could be applied in the context of designing new arrangements for the Costa Rica Dome. For example, CPPS has adopted long-term objectives that could be replicated in the CRD Agreement, such as building up competitive States in the international arena and science-based decision making.[530] On the latter, CPPS has established different groups of experts to promote science-based decision-making processes. The experience of such groups could enhance cooperation and coordination action lines of existing programmes in the Central American region,[531] as well as be complemented by a fit-for-purpose new scheme for the CRD. Nevertheless, cross-sectoral coordination remains a challenge for CPPS, the BBNJ Treaty therefore will provide much impetus to improve conservation and sustainable use of biodiversity in ABNJ.

7.5 CONCLUSIONS

The three case studies examined in this chapter reveal that regional arrangements are the most effective way to implement multilateral and regional obligations. As seen,

[521] See n 455.
[522] CPPS Statutes. Article 3(l).
[523] UNEP-WCMC, above n 411, 81.
[524] See n 498.
[525] See n 499.
[526] UNEP-WCMC, above n 411, 79.
[527] See n 501.
[528] See n 502.
[529] UNEP-WCMC, above n 411, 80.
[530] CPPS, above n 406, 14.
[531] Chapter 5, *ante*.

each regional case study advances the conservation and sustainable use of biodiversity in ABNJ. Moreover, all of the case studies will be complemented in due course by the various elements under discussion in the BBNJ negotiation at the UN, which is the subject matter of chapter 8. Furthermore, as will be seen in chapter 9, they also provide valuable lessons that can be learned and applied in the context of designing new arrangements for the Costa Rica Dome. Importantly, all of the case studies prove the hypothesis that the regional protection of biodiversity in areas beyond national jurisdiction is a crucial corollary to the *erga omnes* obligation to protect the marine environment and to conserve marine resources under international treaty and customary law.

The picture that emerges from the discussion above is multifaceted and even though located in different parts of the world, the regional regimes share both common and distinguishing features. For instance, two of them are backed by legal agreements *strictu sensus*, in so far as a robust framework has been established within the Antarctic Treaty system, with a more modest regime underpinning the CPPS. In contrast, the Sargasso Sea has started its legal pathway with a soft law instrument that might evolve into a stronger regime in the fullness of time.

The second element appears to be a patent weakness common in the law of the sea, which is the absence of robust compliance mechanisms. The effectiveness of such mechanisms are key to accomplishing biodiversity conservation and management goals in ABNJ. CCAMLR compliance mechanism lays on the responsibility of the Flag State, which is complemented by the cooperation of Contracting Parties on conservation measures. However, CPPS and the Sargasso Sea have no compliance mechanism in place so far. Similarly, a relevant matter is the absence of effective institutional arrangements for stakeholder engagement and participation in the compliance regimes.

In relation to the potential expansion of the CPPS legal regime, one intriguing possibility is to expand its cope to cover the CRD area. Two main arguments militate against this development. Firstly, the geographical scope of CPPS covers the entire length of the South American Pacific coast. This would be unsuitable for a discrete and focused regime intended for the conservation of marine biodiversity in the ABNJ of the CRD. Secondly, the mechanisms to operationalize conservation and management measures within CPPS are complex, as there appears to be funding challenges to secure

appropriate resources to effectively address this regional body's competences. The overall conclusion again points to the need for the development of a discrete regulatory regime for the CRD.

CHAPTER 8. TWIN PILLARS: REGULATORY DEVELOPMENTS AT THE UNITED NATIONS AND THE ROLE OF SMALL STATE DIPLOMACY IN ADVANCING THE MULTILATERAL PROCESS

8.1 INTRODUCTION

This study examines the law and policy on the conservation and sustainable use of biodiversity in ABNJ with a view to identifying how best to develop a regional regime for the CRD. The present chapter is divided into two parts that address two core and inter-related developments that are at the heart of this study. First, it looks at the long road of negotiations at the United Nations towards the adoption of a new legally binding instrument that provides for the protection and sustainable use of biodiversity in ABNJ. Second, it considers the efforts made by Costa Rica throughout the multilateral process in advancing international consensus on the protection of biodiversity.

Understanding this journey is central to the hypothesis supporting the need for a discrete regional scheme of protection of biodiversity in areas of the CRD beyond national jurisdiction. Accordingly, the specific research questions tackled in chapter 8 are the following: a) From the perspectives of science, economics and public policy, is there an urgent need to establish a new legally binding instrument for the conservation and sustainable use of marine biodiversity in ABNJ?; b) How has the negotiation process evolved to date?; c) What are the main elements and principal themes discussed by the Preparatory Committee, as well as the conclusions in the form of recommendations to the General Assembly?; d) How has Costa Rica sought to become a global leader on biodiversity within the international community?; e) What position has Costa Rica adopted on the main elements of a package deal under discussion at the BBNJ negotiations?; and f) How can Costa Rica influence further regional action to protect the ABNJ biodiversity associated with the CRD?

As pointed out in chapter 2, the term ABNJ is generally understood to refer to both the Area and the high seas.[1] Accordingly, ABNJ are sea areas beyond the limits of coastal State sovereignty and jurisdiction, where two very distinctive jurisdictional frameworks apply under UNCLOS, namely: the high seas (Part VII) and the regime applicable to the Area (Part XI and Annex III of the Convention).

8.2 GETTING TO THE SCIENTIFIC, ECONOMIC AND PUBLIC POLICY TIPPING-POINTS FOR LAW REFORM

As seen in chapters 2 to 5, the international policy and legal backdrop on sustainable use of marine resources has continuously evolved under a number of instruments, including: the 1992 Agenda 21 adopted at the United Nations Conference on Economic Development; the 2000 United Nations Millennium Declaration including the 2010 Millennium Development Goals; and the 2012 Rio + 20 outcome Document "The Future We Want", among others. In parallel, science has significantly advanced and new studies and marine research have shown a spotlight on the richness of biodiversity in ABNJ, as well as the continuous and multiple threats to the favourable conservation status of species and ecosystems in such areas. The following discussion will address some of the core elements in the scientific, economic and public policy backdrop as a means to contextualise the negotiation process at the United Nations, commonly referred to as the BBNJ process. Special mention is also made of the role of the EU's H2020 project, ATLAS, as an example of the dynamic nature of ocean science and the push to advance scientific knowledge of the deep-ocean, as well as the development of appropriate management tools for biodiversity hotspots both within and beyond national jurisdiction. In this narrative, science, economics and public-policy in eth form of the SDGs are some of the push and pull factors that are informing the international law-making process pertaining to the protection and sustainable use of biodiversity in ABNJ.

8.2.1 Scientific backdrop informing the law and policy-making processes

[1] D. Guilfoyle, 'The High Seas' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: Oxford University Press, 2015), 205.

The Regular Process for the Global Reporting and Assessment of the state of the marine environment has brought together the expertise of scientists from all around the world, with the view to build a baseline through the World Ocean Assessment.[2] Furthermore, as the ABNJ represent around 95 per cent of the habitat occupied by life on Earth in all its forms,[3] a technical report has been developed specifically on ABNJ biodiversity within this global scientific process, which is the first of its kind.[4] Most notably, the report has identified particular characteristics of the deep sea environment where ecological processes are slow, and if disrupted by human activities like fishing or mining, its recovery will be slow and the resilience of ecosystems will be weakened.[5] Oceanic primary production by photosynthesis taking place in the vast ABNJ supports food chain processes for a vast number of species and also is the major supplier of the world's oxygen,[6] playing at the same time a crucial role in carbon sequestration.[7] Likewise, the ABNJ are home to a wide range of species,[8] including marine mammals,[9] marine turtles,[10] and seabirds.[11] Unusual organisms spawn, breed and feed in hydrothermal vents, cold deep ecosystems,[12] and in distant cold-water coral formations in ABNJ.[13] Additionally, these areas support important fisheries and constitute important migratory routes, which is clearly evident from all of the case studies explored in chapters 6-7 heretofore.[14] The existence of an environmental regulatory continuum from the coastal ecosystems through waters under national jurisdiction to ABNJ is a significant premise underpinning ecosystem-based management because many species migrate or range through different areas at different stages of their life cycles,[15] as

[2] The First Global Integrated Marine Assessment, also known as the World Ocean Assessment I, was approved by the United Nations General Assembly (hereafter, UNGA) in December 2015 (See UNGA Resolution 70/235, para. 266), and a programme of work (2017-2020) for the second cycle of the Regular Process for the Global Reporting and Assessment of the state of the marine environment, including socioeconomic aspects, was adopted in 2016 by the UNGA (See UNGA Resolution 71/257, para. 299).
[3] R. Ruwa, et. al., (2017) *Technical abstract of the first global integrated marine assessment on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*. New York: United Nations, para. 2.
[4] Ibid.
[5] Ibid. Para. 5.
[6] Ibid. Para. 6.
[7] Ibid. Para. 19.
[8] Ibid.
[9] Ibid. Para. 45-48.
[10] Ibid. Para. 49.
[11] Ibid. Para. 50.
[12] Ibid. Para. 34.
[13] Ibid. Para. 37, 38.
[14] Ibid. Para. 45-48.
[15] Ibid. Para. 7.

"patterns of marine biodiversity are shaped by variations in temperature, salinity, nutrients and currents of the water column."[16] Moreover, multiple benefits are derived from the biodiversity in ABNJ, such as food security,[17] tourism revenues, scientific knowledge,[18] cultural and heritage values,[19] among others. However, increasing pressures on marine biodiversity in ABNJ pose significant challenges to the long-term sustainability of marine ecosystems and their associated species. These threats include overfishing and IUU fishing,[20] pollutants from land, including discharges and emissions of hazardous substances,[21] as well as marine debris,[22] deep seabed mining,[23] shipping,[24] emerging uses like geo-engineered sequestration of carbon dioxide,[25] and global pressures like ocean acidification,[26] increase of sea-surface temperatures,[27] and shifts in ocean salinity due to broad-scale ocean warming.[28] Consequently, there is an urgent need to shift from the 'business as usual' scenario into a proactive conservation and management approach underpinned by the rule of law as codified in UNCLOS and related instruments.

8.2.2 The science underpinning the climate regime: The IPCC Fifth Assessment Report

Humans depend on marine ecosystem services, such as food provisioning, regulation of global climate, production of oxygen, carbon dioxide sequestration, protection from extreme weather, and aesthetic and cultural services.[29] However, since the industrial revolution, the ocean has absorbed approximately one third of the carbon dioxide

[16] Ibid. Para. 17.
[17] Ibid. Para. 52.
[18] Ibid. Para. 55.
[19] Ibid. Para. 54.
[20] Ibid. Para. 52, 71.
[21] Ibid. Para. 72.
[22] Ibis. Para. 78-80.
[23] Ibid. Para. 81-84.
[24] Ibid. Para. 87-89.
[25] Ibid. Para. 85, 86. See also: "Geo-engineering approaches involving manipulation of the ocean to ameliorate climate change have very large environmental and associated socioeconomic consequences, as stated by the IPCC Fifth Assessment Report." H. O. Pörtner, D. M. Karl, et. al., (2014) 'Ocean systems' in: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. United Kingdom/United States of America: Cambridge University Press, 416.
[26] Ruwa, above n 3, para. 62.
[27] Ibid. Para. 58.
[28] Ibid. Para. 63.
[29] Pörtner, Karl, above n 25, 414.

released by human activities, turning into a major global buffer and therefore mitigating impacts of climate change.[30] Given the interaction between greenhouse gases, climate change and the ocean systems, the Intergovernmental Panel on Climate Change (IPCC, hereafter) identified under the Fifth Assessment Report, specific and alarming facts related to marine environments and their biodiversity.[31] For example, climate change alters physical, chemical and biological properties of the oceans, including salinity, circulation and temperature, which are key elements that determine composition and functioning ecosystems.[32]

Furthermore, these elements also define the geographic distribution of many species, and changing patterns would consequently bring alterations to their life cycle and seasonal activities (i.e., feeding, growth, and productivity),[33] as well as pole-ward latitudinal shifts or to deeper and cooler waters.[34] Therefore, it is estimated that by the mid-21st century, species abundance will increase at mid- and high latitudes and decrease from approximately 40 to 60 per cent in the tropics.[35]

As seen in chapter 2, this specific matter is of particular interest in the CRD region, where a profitable fisheries industry benefits the economies of various countries, and the geographical shifts of fish stocks to northern and cooler latitudes will pose meaningful challenges to management measures and to the application of in-situ conservation tools like MPAs, therefore, exacerbating the socioeconomic vulnerability in these developing tropical countries.[36] In addition to these intricate circumstances, the carbon dioxide absorbed by the ocean has also begun to change its chemistry, altering the PH and turning waters more acidic. Consequently, ocean acidification has negative impacts on the physiology and behaviour of different species, such as corals, molluscs, echinoderms and crustaceans.[37] Again, similar to other ocean regions, the CRD and its associated biodiversity are particularly susceptible to effects of ocean acidification. This is compounded by other concerning features associated with climate change are

[30] Secretary General Report to the Economic and Social Council, Document E/2016/75, 5 July 2016, para. 97.
[31] Pörtner, Karl, above n 25.
[32] Ibid. 414.
[33] Ibid. 415.
[34] Ibid. 414.
[35] Ibid. 415.
[36] Ibid. 416.
[37] Ibid. 415.

the expansion of hypoxic regions and anoxic 'dead zones',[38] as well as the uncertainty about the future trends of major upwelling systems, such as the CRD, and how their drivers (enhanced productivity, acidification and hypoxia) will shape ecosystem characteristics.[39]

All the above supports the view that urgent regulatory action is needed in relation to managing adaptation and mitigation strategies in relation to ABNJ more generally and the CRD most specifically, with a view to moving forward into adaptive management to address changing conditions and extreme shifts on marine habitats and its related biodiversity due to anthropogenic induced effects of climate change.

8.2.3 Discovering the deep oceans: A contribution from ATLAS

The wonders of the deep oceans have been the focus of study for several decades. Additionally, new technologies have allowed humans to access remote areas in the open oceans, and research on ABNJ has revealed an astounding biomass and biodiversity richness. [40] However, and despite the important advancements in understanding such areas, they are still under-explored and not adequately safeguarded. By 2014 only 0.25 per cent of the marine environment beyond national jurisdiction was under protection.[41] There has, however, been considerable progress in the development of regulatory tools,[42] and in applying science in decision-making processes concerning the conservation of marine living resources of the high seas.[43] Different scientific projects have shown the way and a current example of best trans-national scientific practice is the trans-Atlantic assessment and deep-water ecosystem-based spatial management plan for Europe, also known as the ATLAS project.

[38] Ibid.
[39] Ibid. 416.
[40] A. Rogers, L. Woodall (2017) *Function of the high seas, a growing understanding. A synthesis of significant, published marine findings since 2012*. United Kingdom: Oxford University, 3.
[41] Secretary General Report to the Economic and Social Council, Document E/2016/75, 5 July 2016, para. 99.
[42] R. Cormier, et. al., (2017) 'Moving from ecosystem-based policy objectives to operational implementation of ecosystem-based management measures.' *ICES Journal of Marine Science*, Vol. 74 (1), 410.
[43] UNCLOS. Article 119.

The ATLAS project aims to provide the "first coherent, integrated basin-scale assessment of Atlantic deep-water ecosystems and their Blue Growth potential."[44] It amalgamates various research components, including oceanography, ecosystem functioning, biodiversity and connectivity, with the view to use the best available science to inform socioeconomic assessments of marine ecosystems, marine spatial planning, policy-making and regulation processes, as well as promulgates the dissemination of knowledge, to ensure adequate ecosystems management and the sustainable use of marine resources.[45]

While the resources provided by the ocean are unquantifiable as a whole, different areas and features within the ocean hold different values to a variety of users, industry and governments.[46] Therefore, marine values play an important role in tailoring management and conservation measures. The prioritization of ecological, economic and socio-cultural values and its interactions could focus efforts in areas where caution is needed to ensure its conservation.[47] In this regard, the ATLAS project focuses on 12 case studies following the major Atlantic deep-water ecosystems, also taking into account those that have been designated as VMEs or described as EBSA,[48] with the goal to develop science in close collaboration with managers, policymakers and stakeholders.[49]

The results from this project could inform a putative scheme for the CRD, such as the one outlined in chapter 9, particularly how to use the results of marine scientific research in informing decision-making processes in the region.

8.2.4 The sunken billions and the economic justification for law reform

[44] ATLAS project. Available at: http://www.eu-atlas.org/work-package.html
[45] ATLAS project factsheet. Available at: http://www.eu-atlas.org/work-package.html
[46] CSIRO (2017) 'The role of marine values,' *Side event at the Third Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, March 26 – April 7.
[47] Ibid.
[48] ATLAS project (2017) 'Ocean-Scale Science for Effective Marine Governance: A New Approach to Managing Atlantic Ecosystems,' *Side event at the Third Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, March 26 – April 7.
[49] Cormier, above n 42, 410.

As global marine fisheries are in crisis,[50] the World Bank and the FAO published a ground-breaking report, *The Sunken Billions*, in 2009 to raise awareness of the economic cost of fisheries missmanagement.[51] The report shows how IUU fishing and weak governance translated into a cumulative global loss of USD$50 billion annually of potential economic benefits from marine fisheries, [52] which increased into approximately $83 billion in 2012,[53] amounting to a disastrous cumulative global loss of USD$2.2 trillion from 1974 to 2008.[54]

The Report reveals a solid argument when talking about biodiversity loss, as the "depletion of a nation's fish stocks constitutes a loss of the nation's natural capital and thus a loss of national wealth."[55] More specifically on high seas fisheries, there is an estimation that USD$1.25 billion of the worldwide value of IUU catches comes from international waters, undermining multilateral agreements on fisheries management, as common property resources. [56] For decades global marine catches have been stagnant while fish stocks have severely declined,[57] and increasing pressures from fishing, loss of habitats and pollution [58] have turned fish stocks status into fully exploited or overexploited. In other words, "when fish stocks are fully exploited, the associated fisheries industry is underperforming below their economic optimum."[59] In parallel, there is a massive overcapacity in the global fleet, as an excess of fishermen are in a continuous competition for limited living marine resources, resulting in economic inefficiency.[60] To maintain profitability from these stumbling circumstances, global fleets had taken additional measures, including the reduction of labour costs, lobbying for subsidies and increasing investment in technology.[61]

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[50] M. Kobayashi, et. al., (2016) *The Sunken BillionsRrevisited. Progress and Challenges in Global Marine Fisheries*. Washington, DC: The World Bank, 1.
[51] R. Arnason, K. Kelleher, R. Willmann (2009) *The Sunken Billions, the Economic Justification for Fisheries Reform*. Washington, DC: The World Bank, 1. Most recently, an updated version of this Report has been published in 2017. See Kobayashi, above n 50.
[52] Arnason, Kelleher, Willmann, above n 51, xvii.
[53] Kobayashi, above n 50, 3.
[54] Arnason, Kelleher, Willmann, above n 51, xix.
[55] Ibid. xx.
[56] High Seas Task Force (2006) *Closing the Net: Stopping illegal fishing on the high seas. Final report of the Ministerially-led Task Force on IUU Fishing on the High Seas*. United Kingdom: UK Department for Environment, Food and Rural Affairs.
[57] Arnason, Kelleher, Willmann, above n 51, xviii.
[58] Ibid. xvii.
[59] Ibid. xvii, 2.
[60] Ibid. xviii.
[61] Ibid. xviii.

To address these alarming circumstances, the Report indicates that by improving governance of living marine resources through comprehensive reforms, society could capture a substantial part of the sunken billions.[62] Moreover, as economically healthy marine fisheries can deliver a sustainable flow of economic benefits,[63] some key reforms suggested by the Report are a 44 per cent reduction in global fishing effort,[64] the creation of transition pathways with alternative economic opportunities for fishermen, equitable sharing of benefits from fisheries, the elimination of illegal fishing, the reduction or elimination of subsidies, and political will to implement the reforms, among others.[65]

The economic justification for a new approach is predicated on the view that recovered marine fisheries could generate economic growth and be the basis for alternative livelihood opportunities.[66] This is fundamental to achieving accepted international goals for the fisheries sector.[67] The continuation of the 'business as usual' model of fishery management will result in the collapse of fish stocks, as well as escalate social and political pressures and poverty.[68] This clearly undermines the SDGs and the attainment of the fishery related targets in Goal 14, including, specifically, the requirement to "effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics" by 2020.

8.2.5 Policy backdrop: Sustainable Development Goal 14 aiming to deliver a wave of change for the oceans

Different uses of marine resources, such as the extraction of fuels and minerals,[69] food production [70] and maritime transportation [71] have been the cornerstone of

[62] Ibid. xvii, xx.
[63] Ibid. xx.
[64] Kobayashi, above n 50, 4.
[65] R Arnason, Kelleher, Willmann, above n 51, xx.
[66] Ibid. xxi.
[67] Ibid.
[68] Ibid.
[69] Rogers, Woodall, above n 40, 3, 4.
[70] Ibid. 5.
[71] Ibid. 10.

socioeconomic welfare worldwide. There is general acceptance that the long-term availability of such resources depends on sustainable use, as is evident from the agreement on the 17 Sustainable Development Goals[72] (hereafter, SDGs) as part of the 2030 Agenda for Sustainable Development agreed upon in September 2015.[73] The upcoming 15 years will be the timeframe for the implementation of these goals, which have built on the previous Millennium Development Goals, but have a broader scope covering the three dimensions of sustainable development, namely: economic growth, social inclusion and environmental protection.[74] Moreover, even though the SDGs are not legally binding, States are expected to implement and achieve these goals and related targets through their inclusion in the countries' policies and programmes, as well as to follow the Addis Ababa Action Agenda.[75] The review and monitoring of the SDGs implementation, through global and national indicators, is a key responsibility expected from governments including Central American states.[76]

The BBNJ negotiation process described below, and the development of a regional regime for the CRD as set out in chapter 9, must now be contextualised within the broader objectives of the SDGs. Specifically, Goal 14 develops a series of targets to "conserve and sustainably use the oceans, seas and marine resources for sustainable development."[77] These targets include actions on the prevention and reduction of marine pollution;[78] the sustainable management and protection of marine and coastal ecosystems using ecosystem-based approaches;[79] address the impacts of ocean acidification;[80] end overfishing, IUU fishing and implement science-based management plans;[81] conserve at least 10 per cent of coastal and marine areas;[82] prohibit certain forms of fisheries subsidies;[83] increase scientific

[72] UNGA Resolution A/RES/70/1, 21 October 2015, 14.
[73] Ibid.
[74] United Nations Sustainable Development Agenda. Available at: http://www.un.org/sustainabledevelopment/development-agenda/
[75] The Addis Ababa Action Agenda of the Third International Conference on Financing for Development. Available at: http://www.un.org/esa/ffd/ffd3/wp-content/uploads/sites/2/2015/07/Addis-Ababa-Action-Agenda-Draft-Outcome-Document-7-July-2015.pdf
[76] United Nations Sustainable Development Agenda, above n 74.
[77] Sustainable Development Goal 14.
[78] SDG 14, target 14.1.
[79] SDG 14, target 14.2.
[80] SDG 14, target 14.3.
[81] SDG 14, target 14.4.
[82] SDG 14, target 14.5.
[83] SDG 14, target 14.6.

knowledge, capacity building and transfer of marine technology;[84] access rights for small-scale fisheries;[85] and the effective implementation of international law as reflected in UNCLOS.[86]

Similarly, the BBNJ negotiation process described below must also be framed by the SDGs, as a means to implement ABNJ biodiversity and related commitments under UNCLOS.[87] A putative scheme for the conservation and management of marine resources in the CRD, taking into consideration socio-economic and environmental elements as pillars of the sustainable development concept, will undoubtedly support the achievement of Goal 14 including the obligation to manage and protect marine ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans, as well as the more general obligation to implement international law.[88]

8.3 NEGOTIATING A NEW INSTRUMENT UNDER UNCLOS

Parts of the discussion below are replicated from a joint publication by the author with Professor Ronán Long.[89] The publication notes that the negotiation process of a new legally binding instrument for the conservation and sustainable use of marine biodiversity in ABNJ[90] (biodiversity beyond national jurisdiction or BBNJ Agreement, hereafter) is informed by increasing scientific information about the anthropogenic impacts on the marine environment such as the reports outlined above, as well as by the political and legal developments in international law during the past two decades including the negotiating of the SDGs. More specifically, the rationale underpinning the

[84] SDG 14, target 14.A.
[85] SDG 14, target 14.B.
[86] SDG 14, target 14.C.
[87] UNGA Resolution A/RES/66/288, 11 September 2012, para. 162.
[88] SDG 14. Target 14.C.1: "Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources."
[89] R. Long, M. Rodriguez Chaves (2016) 'Anatomy of a new international instrument for biodiversity beyond national jurisdiction: First impressions of the preparatory process,' *Environmental Liability: Law, Policy and Practice Journal*, Vol. 25(2), 215.
[90] Within discussions at the United Nations, the process has been informally entitled as the biodiversity beyond national jurisdiction process (BBNJ process) and the subsequent legal instrument as the BBNJ Agreement.

development of a new BBNJ Agreement stems from a number of factors, including the inadequacy of UNCLOS and other marine environmental instruments in combating the threats posed by human activities to biodiversity in the deep ocean.[91] As the current conservation measures have not been successful, the regulatory framework and institutional architecture for the protection and use of biodiversity in ABNJ remains disparate and, in many respects, unfit for this purpose.[92] This is compounded by the limited competence of multilateral and regional bodies making them unsuitable to tackle crosscutting governance and management issues, or effectively to address the cumulative effects of the various anthropogenic impacts on the marine environment.[93] This is exacerbated by the phenomena of non-compliance and with shortcomings in the law of the sea more generally, as well as flag state responsibility in particular.[94]

Thus, there is an urgent need for the on-going codification of new legal provisions for environmental management, and more specifically of an integral and comprehensive multilateral treaty focused specifically on marine biodiversity in ABNJ. Moreover, there have been a number of developments taking place in intergovernmental, non-governmental and academic settings since the late 1990s.[95] A major step forward was taken when the UN General Assembly decided in 2004 to establish the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (BBNJ Working Group, hereafter), and called upon States and international organisations "to take action urgently to address, in accordance with international law, destructive practices that have adverse impacts on marine biodiversity and

[91] G. Wright, J. Rochette, E. Druel and K. Gjerde (2015) *The long and winding road continues: towards a new agreement on high seas governance*. Paris: IDDRI. (Study No. 01/16). Also, as examined in Chapters 3 and 4 of this study, these instruments and bodies include: the Convention on Biological Diversity, the Convention on the Conservation of Migratory Species of Wild Animals, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the United Nations Food and Agriculture Organisation, the International Seabed Authority, the International Maritime Organisation, the regional seas bodies under the United Nations Regional Seas Programme and over two dozen regional fisheries management organisations. UNGA Resolution A/59/62/Add.1, 18 August 2004, para. 310

[92] R. Warner, 'Conserving Marine Biodiversity in Areas Beyond National Jurisdiction: Co-evolution and interaction with the Law of the Sea' in D. Rothwell, A. Oude Elferink, K. Scott and T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015), 752, 758.

[93] Long, Rodriguez Chaves, above n 89, 217.

[94] R. Churchill, 'The persisting problem of non-compliance with the Law of the Sea Convention: disorder in the oceans' in D. Freestone (ed.) *The 1982 Law of the Sea Convention at 30: Successes, Challenges and New Agendas* (The Hague: Martinus Nijhoff Publishers, 2013), 139–46.

[95] Long, Rodriguez Chaves, above n 89, 217.

ecosystems."[96]

The BBNJ Working Group was tasked with a wide mandate, namely: (1) surveying the activities of the UN and other organisations on the conservation and sustainable use of biodiversity in ABNJ; (2) examining the topic from scientific, technical, economic, legal, environmental and socio-economic perspectives; (3) identifying where further studies were needed; and (4) indicating the scope for greater international cooperation and coordination on the subject-matter.[97] The BBNJ Working Group convened nine occasions between 2006 and 2015, and produced a series of reports, technical papers and presentations on the principal issues relating to the conservation and sustainable use of marine biodiversity in ABNJ, as well as on scope, parameters and feasibility of adopting a new instrument, along with the law and policy options that could be used for this purpose.[98]

In 2011 a major milestone was achieved, when the BBNJ Working Group recommended that a process be initiated by the General Assembly to identify legal and implementation gaps within the international legal framework, with the possible development of a new multilateral agreement under UNCLOS.[99] Significantly, the BBNJ Working Group also recommended that this process would address four substantive elements in an integrated manner as a 'package', namely: (1) marine genetic resources (MGRs), including questions on the sharing of benefits; (2) measures such as area-based management tools, including MPAs; (3) environmental impact assessments; and (4) capacity building and the transfer of marine technology (referred to below as the 2011 package).[100]

Moreover, additional momentum and a long-overdue sense of urgency were added by States at the 2012 Rio United Nations Conference on Sustainable Development, when they entered into a commitment under the chapeau of 'The future we want' to build on the work of the BBNJ Working Group and to address conservation and sustainable use

[96] Established by UNGA Resolution A/59/24, 4 February 2005, para. 73, 74.
[97] Ibid.
[98] Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction. Available at: http://www.un.org/depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm.
[99] UN Doc. A/66/119, 30 June 2011, Annex para. 1(a). Letter from the Co-Chairs of the Ad Hoc Open-ended Informal Working Group to the President of the General Assembly.
[100] Ibid. Annex para. 1(b).

of marine biodiversity, including taking a decision on the development of a new instrument before the end of the sixty-ninth session of the General Assembly in 2015.[101] A further major breakthrough was achieved when the United Nations General Assembly decided in Resolution 69/292 to develop, under UNCLOS, an international legally binding instrument on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction.[102] In moving the process forward, the General Assembly established a Preparatory Committee (PrepCom, hereafter), which met for four sessions between 2016–2017 with the objective of making substantive recommendations to the General Assembly on the elements of a draft text of the instrument, taking into account the work of the BBNJ Working Group.[103] In striving for extensive and transparent participation, the process was open to all UN Member States, members of the UN specialized agencies and Parties to the Convention, as well as observers, with the goal to achieve the broadest possible engagement.[104] As such, participation by non-Parties to UNCLOS did not affect their legal status with regard to the Convention or any other related agreements.[105]

Furthermore, to ensure the widest possible acceptance of any new instrument in the fullness of time, the PrepCom was compelled to exhaust every effort to reach agreement on substantive matters by consensus where possible, but in the absence of consensus, there was also a possibility for the PrepCom to make recommendations on contested matters.[106] Instructively, the negotiations must address 'together and as a whole' the four elements identified in the 2011 package.[107] Additionally, this process should not undermine the mandates or instruments adopted by international bodies,[108] which was highlighted continuously by several States and international organisations

[101] UN Doc. A/RES/66/288, 11 September 2012, para. 162.
[102] UNGA Resolution A/RES/69/292, 6 July 2015, para. 1.
[103] Ibid. Para 1(a)–(b).
[104] Ibid. Para 1(a).
[105] Ibid. Para 4.
[106] Ibid. Para 1(h)–(i).
[107] Ibid. Para 2. "As an aside, it ought to be mentioned that the consensus and integrated approach is not unusual and reflects the unique circumstances from which the 2011 package deal emerged and will ensure that each element of the negotiations is given equal weight, with a view to engendering compromise and universal acceptance of the outcome of the process. Indeed, this approach is typical of law of the sea negotiations since the Third United Nations Conference on the Law of the Sea (1973–1982) and has contributed to the extraordinary achievements and almost universal acceptance of UNCLOS over the past three decades." Long, Rodriguez Chaves, above n 89, 219. See also: Statement by B. Zuleta, in M. Nordquist (ed.), *United Nations Convention on the Law of the Sea 1982: A Commentary,* Vol. 1 (The Hague: Martinus Nijhoff, 1985), 17-28.
[108] UNGA, above n 102, para. 3.

during the PrepCom negotiations.

The PrepCom[109] undertook its deliberations in working groups addressing the elements of the package deal and crosscutting issues,[110] and the second week of the meetings concentrated on Plenary discussions. Every PrepCom moved forward into deeper details than the previous ones, and discussions advanced steadily to reach agreement and convergent views in various elements.[111] Notably, the final PrepCom had a similar format as the previous sessions, starting with discussions within the five Working Groups on the elements of the package and crosscutting issues, followed by Plenary sessions. Wide participation from UNCLOS State Parties, Non-Parties, Intergovernmental Organisations and Non-Governmental Organisations enriched the exchange of ideas.[112] Finally, a recommendation was agreed by consensus on 21st July 2017.[113] The recommendation included a list of convergent[114] and divergent[115] elements that should be considered as a reference within the development of a draft text of the BBNJ legally binding instrument.[116] On the procedural component, the positive

[109] PrepCom 1 took place from the 28 March–8 April 2016, PrepCom 2 took place 26 August–9 September 2016, subsequently PrepCom 3 was held from 27 March-7 April 2017, and finally PrepCom 4 was convened from 10 July–21 July 2017.
[110] The crosscutting working group was established after the first session of PrepCom. International Institute for Sustainable Development (IISD, hereafter) (2016) 'Summary of the second session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(118).
[111] IISD (2017) 'Summary of the third session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(129).
[112] DOALOS (2017) *Report of the Preparatory Committee established by General Assembly resolution 69/292. Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction. Advance, unedited version*. Available at http://www.un.org/depts/los/biodiversity/prepcom_files/Procedural_report_of_BBNJ_PrepCom.pdf. Para. 34.
[113] Ibid. Para. 38.
[114] Ibid. Section A. Some examples of convergent elements are: scope; general objectives; general principles and approaches; international cooperation; specific objectives on MGRs, ABMTs and capacity building; process in relation to ABMTs, including MPAs; obligation to conduct EIAs; procedural elements and contents of EIAs; institutional arrangements including a decision making body, scientific committee, secretariat, and a clearing house mechanism; settlement of disputes; responsibility and liability; among others.
[115] Ibid. Section B. Some examples of divergent elements are the following: on MGRs: regulatation of access; the nature of MGRs; what benefits should be shared; whether to address intellectual property rights. On ABMTs: appropriate decision-making and institutional set up to avoid undermining existing regional frameworks. On EIAs: procedural aspects, process should be conducted by States or be "internationalized." On capacity building and technology transfer: terms and conditions. On institutional arrangements: relationship between a new global BBNJ structure and relevant global, regional and sectoral bodies, among other matters.
[116] Ibid. Para. 38(1).

outcome of this process rests with the General Assembly, as the recommendation called for the UNGA to convene an Intergovernmental Conference as soon as possible to consider the recommendations of the PrepCom and elaborate the text of an international legally binding instrument under UNCLOS.[117]

8.4 BUILDING BLOCKS OF A NEW REGIME FOR ABNJ

As seen above, the development of a new legally binding instrument focuses on four main elements, known as the package deal, as well as a number of crosscutting issues. Some of the principal features of the negotiations are reviewed below.

8.4.1 Innovative and pragmatic approaches to marine genetic resources

One of the hot topics and substantive elements for negotiation at the PrepCom is the development of legal provisions to apply to MGRs. Discovery and commercialisation of novel biomedicines and pharmaceutical products derived from marine organisms have occured since the late 1950s, and recent discoveries as well as published studies on the topic, [118] have renewed interest in the exploration and exploitation of deep-sea biodiversity for commercial purposes, in light of their unique properties, chemical structures and biosynthetic characteristics. [119] Although not a very accurate indicator of commercial potential, patents have been issued in relation to marine genetic material in 31 countries, nearly all of which relate to research activities in developed countries.[120] However, it should be noted that the chances of success are remote (a 1:4000 chance) with only seven approved drugs discovered from research on 28,000 marine compounds until 2016, none of which is considered to be a runaway success story commercially.[121] Additionally, the commercialisation of products from marine

[117] Ibid. Para. 38(2).
[118] M. Vierros, C. Suttle, H. Harden-Davies, G. Burton (2016) 'Who owns the ocean? Policy issues surrounding marine genetic resources,' *Limnology and Oceanography Bulletin*. Vol. 29.
[119] Examples of drugs developed from marine compounds include: the development of Prialt for pain from the Philippino cone snail and Halaven for cancer from Japanese deep water sponges. See M. Jaspars (2016) 'Bioprospecting from marine genetic resources from areas beyond national jurisdiction,' *All day workshop on marine genetic resources in Areas Beyond National Jurisdiction*. New York University Law School, 27 August 2016. Unpublished presentation. See also http:// marinepharmacology.midwestern.edu/
[120] IISD (2016) 'Summary of the first session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(106), 6.
[121] J. A. DiMasi, H. Grabowski, R. Hansen (2016) 'Innovation in the pharmaceutical industry: new estimates of R&D costs,' *Journal of Health Economics*. Vol. 47.

compounds could take decades and returns on scientific discoveries are relatively modest, given the costs associated with conducting deep-ocean research and the subsequent work on clinical trials on new products.[122]

Against this background, one of the contentious topics for deliberation at the PrepComs is the development of a new regime for MGRs in ABNJ. Important aspects have been discussed, such as the definition of MGRs,[123] the legal rules that ought to apply to research, conservation and sustainable use of MGRs, along with the arrangements for the equitable sharing of the benefits derived from research and the commercial use of genetic material.[124] Other prominent challenges include the traceability of MGR source material, as the bio-discovery process may take decades from sampling at sea to product commercialisation, along with difficulties associated with the regulation of rapidly changing scientific fields, such as developments in research and synthetic biology.[125]

At the same time, diverging views regarding the precise legal status of such resources in ABNJ have arisen and whether they fall solely within the scope of the high seas provisions of UNCLOS, including the freedom of scientific research, or whether they can be considered as part of the Area and its resources, and thus subject to the principle of the common heritage of mankind and the access and benefit-sharing regime, taking into consideration the interests and needs of developing States.[126] Another corollary of this dilemma is whether a uniform legal regime and regulatory coherence ought to apply to the MGRs of both the seabed and the water column, given that organisms may move through the seabed, on the seabed and in the water column at different stages of their life cycles.[127] A further issue that needs to be resolved is the

[122] Jaspars, above n 119.
[123] Long, Rodriguez Chaves, above n 89, 222.
[124] IISD (2016) 'PrepCom 1 highlights: marine genetic resources,' *Earth Negotiations Bulletin*. Vol. 25 (105). See also: IISD (2016) 'PrepCom 2 highlights: marine genetic resources,' *Earth Negotiations Bulletin*. Vol. 25 (109); and IISD (2017) 'PrepCom 3 highlights: marine genetic resources,' *Earth Negotiations Bulletin*. Vol. 25 (120).
[125] Jaspars, above n 119.
[126] IISD, above n 111, 3.
[127] Chair's compilation of issues raised during the first session of the Preparatory Committee. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/PrepCom_1_Chair's_Overview.pdf, 7. Also, much of the difficulty in this regard stems from Part XI of UNCLOS, which defines 'resources' in unambiguous terms to mean 'all solid, liquid or gaseous mineral resources in situ in the Area at or beneath the sea-bed, including polymetallic nodules' (UNCLOS. Article 133). This of course may be contrasted with the absence of a definition of resources in the 1970 UN

applicability or otherwise of the rules on access and benefit sharing set out in the Nagoya Protocol to the Convention on Biological Diversity, in particular article 10,[128] as well as the FAO International Treaty on Plant Genetic Resources.[129] Again, as the law currently stands, the scope of these instruments does not apply fully or directly to the MGRs of areas beyond national jurisdiction.

Within the PrepCom deliberations, concerns on the extent of *in situ*, *ex situ* and *in silico* access to genetic material and biological data has been expressed, as well as the material scope of the new instrument and its applicability to all MGRs and all potential uses of biodiversity across different sectors.[130] Thus, the role of the International Seabed Authority, or a new putative authority, in the administration and management of an access and benefit sharing regime, as well as the role of the World Intellectual Property Organisation in relation to intellectual property rights and patent law, were highlighted during the PrepCom discussions.[131]

In light of the intense discussions, making recommendations on the design of an access and benefit sharing regime that is both practical and pragmatic and which does not undermine Parts VII and XI of UNCLOS, as well as the 1994 Implementation Agreement, or that hampers marine scientific research, remains one of the key challenges to be overcome at the Intergovernmental Conference.[132] One potential solution canvassed by a number of participants is the development of a *sui generis* regime under the BBNJ Agreement applicable to MGRs in ABNJ.[133]

8.4.1.1 Recommendation of the PrepCom

General Assembly Resolution 25/2749, A/RES/25/2749. Long, Rodriguez Chaves, above n 89, 223.

[128] See UN Doc. UNEP/CBD/COP/DEC/X/1, 12 October 2014.

[129] International Treaty on Plant Genetic Resources for Food and Agriculture, 2400 UNTS 303. Entered into force 29 June 2004.

[130] IISD, above n 120.

[131] IISD, above n 124, 2. See also: IISD, above n 111, 4 and IISD (2016) 'Summary of the second session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(118), 5.

[132] Long, Rodriguez Chaves, above n 89, 223.

[133] First session of the BBNJ Preparatory Committee at the United Nations. 28 March – 8 April 2016. Statement by Indonesia. Monday, March 28, 2016. Available at http://statements.unmeetings.org/media2/7656866/indonesia.pdf. See also: Long, Rodriguez Chaves, above n 89, 223.

Without prejudice to the position adopted by States, the recommendations of the PrepCom to the General Assembly are slightly ambivalent and divided into two sections (A and B). Essentially, the elements described in section B require most attention towards further progress of the implementation by the General Assembly. In relation to MGRs, the recommendation is inconclusive in so far as Part A provides that the text of the implementation agreement would set out the geographical and material scope of application of the MGR provisions, along with specific measures that set out the objectives of the access and benefit-sharing scheme including their contribution to the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, as well as to building capacity of developing countries. The principles and approaches guiding benefit-sharing should include the benefits to be derived for current and future generations (reflecting the principle of inter-generational equity), as well as promote marine scientific research and development. The agreed text would set out modalities for the sharing of benefits, taking into account existing instruments and frameworks, such as a clearing-house mechanism. On the difficult issue of intellectual property rights, the agreed text could set out the relationship between the implementation instrument and related regimes. The text should also address the monitoring of the utilization of MGRs. [134]

Part B is inconclusive in that it states somewhat paradoxically in light of Part A above that further discussions are required on whether the instrument should regulate access to marine genetic resources; the nature of these resources; what benefits should be shared; whether to address intellectual property rights; and whether to provide for the monitoring of the utilization of marine genetic resources of areas beyond national jurisdiction.[135]

8.4.2 Towards conservation in the ocean's wild west

As "nature's creative power is far beyond man's instinct of destruction," [136] the development of legal provisions to ensure the long term existence of biodiversity treasures in ABNJ have been addressed under the second element of the package deal,

[134] DOALOS, above n 112, 11, 12.
[135] Ibid. 20
[136] J. Verne, *Twenty thousand leagues under the seas: An underwater tour of the world* (France: Pierre-Jules Hetzel, 1870).

area-based management tools (ABMTs, hereafter), including marine protected areas.[137] The negotiation process thus presented an opportunity to discuss how best to operationalize international commitments, including the target of 10 per cent of coastal and marine areas to be "conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures" by 2020,[138] set by the CBD CoP and reflected in Goal 14.5 of the 2030 Agenda for Sustainable Development. One must also keep in mind that the concepts of 'area-based management tool' and 'marine protected area' are not used in UNCLOS. They are defined and applied nonetheless by multilateral and regional bodies for the purpose of protecting specific aspects of the marine environment.[139] A major weakness is that in the absence of the new instrument, it has not been possible to designate or implement ABMTs at a multilateral level with a view to achieving biodiversity conservation or sustainable use objectives in ABNJ.[140] In light of the absence of an overarching framework and a common global approach underpinned by international law, during the three first meetings of the PrepCom, different issues were discussed, including general principles and procedures that ought to apply to the identification, designation and management of ABMTs, the establishment of a global network of MPAs in ABNJ, scientific criteria and universal standards on the setting of management objectives and the establishment of monitoring programmes, as well as mechanisms for ensuring compatibility and coordination. Moreover, new arrangements should use the International Union for Conservation of Nature categories of protected areas and draw from the experience concerning spatial designations under IMO instruments. These are areas of particular environmental interest by the ISA and the identification of ecological and biologically significant areas under the Convention on Biological Diversity, and the protection of vulnerable marine ecosystems by RFMOs, amongst others.[141]

The discussion on a number of matters proved inconclusive such as effective mechanisms for ensuring enforcement and compliance with ABMTs, the pre-eminence

[137] UNGA, above n 102, para. 2.
[138] United Nations Environment Programme UN Doc. UNEP/CBD/COP/10/27 Annex. See also: 2002 Plan of Implementation of the World Summit on Sustainable Development, as well as the United Nations Transforming our World: the 2030 Agenda for Sustainable Development. UNGA Resolution A/RES/70/1, 2015, Goal 14.5.
[139] Long, Rodriguez Chaves, above n 89, 223.
[140] UNGA, above n 102.
[141] IISD, above n 120, 9-11. See also: IISD, above n 131, 5-9; and IISD, above n 111, 5-7.

of flag state jurisdiction on the high seas under UNCLOS, the relationship with enforcement and compliance models operated by regional seas organisations and the RFMOs, as well as the application of multilateral and regional measures to non-parties to the new instrument.[142] In addition, some of the implications of adjacency for the BBNJ Agreement have been identified by Dr. Warner, who emphasised the existing obligation of States to pursue protection of the marine environment in both EEZs and ABNJ, under UNCLOS and other multilateral agreements. Furthermore, some provisions in UNCLOS and State practice evidences the conservation of the marine environments and resources of adjacent high seas areas, but a more comprehensive, holistic and practical approach to adjacency is necessary to ensure compliance by all States with conservation and sustainable use measures that may be implemented in ABNJ.[143]

Another significant legal aspect to be considered while addressing adjacency relates to the high seas areas superjacent to the extended continental shelf, over 200 miles beyond the baseline of some coastal States.[144] States exercise sovereign rights on the extended continental shelf in relation to exploring and exploiting non-living resources, as well as sedentary species.[145] For this purpose, they may also adopt policies to ensure the sustainable management and conservation of the associated biodiversity, including establishing MPAs in relation to their continental shelf (though not in the high seas above).[146] On the other hand, and apart from the legal considerations, there is an undeniable ecological connectivity, an environmental continuum, as ocean resources transcend jurisdictional boundaries.[147] Therefore, the conservation of migratory and straddling biodiversity, within and beyond national jurisdictions, requires the codification of appropriate means to achieve better stewardship of the marine environment.[148]

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[142] Long, Rodriguez Chaves, above n 89, 224.
[143] R. Warner (2017) 'The connected legal seascape of areas within and beyond national jurisdictions,' *Side event at the Third Session of the BBNJ Preparatory Committee*. March 26 – April 7, United Nations Headquarters. See also: D. Dunn, et. al., (2017) *Adjacency: How legal precedent, ecological connectivity and traditional knowledge inform our understanding of proximity*. Japan: Nippon Foundation - Nereus Programme.
[144] UNCLOS. Article 76 (4)–(6).
[145] UNCLOS. Article 77 (4).
[146] See J. Mossop (2007) 'Protecting biodiversity on the continental shelf beyond 200 nautical miles,' *Ocean Development and International Law*, Vol. 38, 283, 289.
[147] Dunn, above n 143, 6.
[148] Ibid. 9.

8.4.2.1 Recommendation of the PrepCom

The new BBNJ Agreement would set out objectives of area-based management tools, including MPAs reflecting the relationship to measures under relevant instruments, frameworks and bodies. With a view to advancing coherence and greater coordination, the text would set out the relationship between such measures and existing legal instruments and frameworks adopted by global, regional and sectoral bodies, without prejudice to their respective mandates. This extends to addressing the relationship with measures adopted by adjacent coastal States, including issues of compatibility, without prejudice to the rights of coastal States. The text would set out the process for identification of ABMTS based on the best available scientific information, standards and criteria, including the following factors: uniqueness; rarity; special importance for life history stages of species; importance for threatened, endangered or declining species and/or habitats; vulnerability; fragility; sensitivity; biological productivity and diversity; representativeness; dependency; naturalness; connectivity; environmental processes, along with economic and social factors. The elements of the proposal should include: geographic/spatial description; threats/vulnerabilities and values; ecological factors related to identification criteria; scientific data concerning the standards and criteria for the identification of the area; conservation and sustainable use objectives; the role of relevant global, regional and sectoral bodies; existing measures in the area or areas adjacent to it; specific human activities in the area; socio-economic considerations; a draft management plan; as well as monitoring, research and review plan.

In addition, the text would set out a process for coordination and consultations on the proposal with relevant global, regional and sectoral bodies, all States, including adjacent coastal States, and other relevant stakeholders, including scientists, industry, civil society, traditional knowledge holders and local communities. On the crucial decision of decision-making, the text would set out how decisions on matters related to area-based management tools, including marine protected areas, would be made, including who would make the decision and on what basis. In this context, the text would address the question of the involvement of adjacent coastal States, as well as the responsibility of Parties to the instrument. The text would set out provisions for assessing the effectiveness of ABMTS and subsequent follow-up action, bearing in mind

the need for an adaptive approach to management and implementation. [149]

Part B of the recommendation notes that "further discussions are required on the most appropriate decision-making and institutional set up, with a view to enhancing cooperation and coordination, while avoiding undermining existing legal instruments and frameworks and the mandates of regional and/or sectoral bodies."[150]

8.4.3 Foreseeing marine environmental repercussions

Closely related to the topics of ABMTs and MGRs is the issue of environmental impact assessments (EIA) and strategic environmental impact assessments (SEA). These assessments are well-established procedural tools that provide for the scientific and technical evaluation of the impacts of activities, as well as the effects of policies, plans and programmes on the environment. [151] Ultimately, the purpose of any such assessment is to ensure that the environmental effects are assessed before a decision is taken to authorise or approve proposed activities, plans, programmes or projects.[152] In addition, the need of applying these tools is evident from UNCLOS, which imposes a general obligation on States to assess the potential effects of activities under their jurisdiction or control when they have reasonable grounds for believing that they will cause pollution or environmental damage.[153]

Particular provisions have been established in the international framework, such as the ISA, which has agreed standards in relation to thresholds and baseline obligations for assessing the impacts of exploration activity.[154] Moreover, the duty to undertake EIA received the *imprimatur* of the International Tribunal on the Law of the Sea in the Seabed Mining Advisory Opinion, which advised that EIA is an obligation under

[149] DOALOS, above n 112, 12-14. All the indicated elements in subsection 8.4.2.1 of this chapter are stated in Section A of the Recommendation.
[150] DOALOS, above n 112, 20.
[151] N. Craik, *The International Law of Environmental Impact Assessment: Process, Substance and Integration* (Cambridge: University Press, 2010) *passim*. See also: S. Bell, D. McGillivray, O. Pedersen, *Environmental Law* (United Kingdom: Oxford University Press 2013), 452–97; and P. Sands, J. Peel, *Principles of International Environmental Law* (United Kingdom: Cambridge University Press, 2012), 604.
[152] Long, Rodriguez Chaves, above n 89, 224.
[153] UNCLOS. Article 206.
[154] M. Lodge, 'The deep seabed' in D. Rothwell, A. Oude Elferink, K. Scott and T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015), 226, 240.

UNCLOS and a general obligation under customary international law.[155] There are many other EIA regimes that arise under sector-specific treaties and regional frameworks, including procedures adopted by the FAO and RFMOs in relation to deep-sea fishing activities.[156] Even though there is considerable development in the jurisprudence of the international court and tribunals on the subject-matter of EIA within national jurisdiction and in a trans-boundary setting, there are, however, no global procedures or institutional structures governing the conduct of EIA or SEA that are specific to the conservation or sustainable use of marine biodiversity in ABNJ.

Within the PrepCom working sessions, some of the matters that were raised included: the nature of activities subject to assessment; the procedures and thresholds that ought apply to EIA/ SEA; transparency and the requirement of public notification; the governance arrangements for decision making; the need to strengthen the normative obligation that arises under UNCLOS so that potential impacts are considered before activities are undertaken in ABNJ and the need to assess cumulative impacts, as well as guidance on reporting, monitoring and the management of information resulting from assessments, including a centralised mechanism for information-sharing and review.[157]

Significantly, the issue of considering the full range of pressures on the environment and its associated ecosystems and cumulative impacts was a recurrent topic of the PrepCom's deliberations on EIA.[158] Other matters addressed during discussions at the United Nations included the feasibility of establishing a new body to oversee

[155] See: *Pulp Mills on the River Uruguay (Argentina* v. *Uruguay),* Judgment, I.C.J. Reports 2010*; Certain activities carried out by Nicaragua in the border area* (Costa Rica v. Nicaragua) and *Construction of a road in Costa Rica along the San Juan river* (Nicaragua v. Costa Rica), Judgement I.C.J. Reports 2015; *Responsibilities and Obligations of State Sponsoring Persons and Entities with Respect to Activities in the Area* (Advisory Opinion), International Tribunal for the Law of the Sea, Seabed Disputes Chamber, Case No. 17, 2011.

[156] On the obligation to undertake EIA under several marine environmental treaties see D. Rothwell, T. Stephens, *The International Law of the Sea*, 2 ed., (Oxford and Portland Oregon: Hart Publishing, 2016), 524, 525. See also: the Convention on Environmental Impact Assessment in a Transboundary Context 1989 UNTS 310, entered into force 10 September 1997 and its complementary Protocol on Strategic Environmental Assessment 2685 UNTS, entered into force 11 July 2010; and the Protocol on protection of the environment to the Antarctic Treaty 1991, entered into force 14 January 1998. Non-binding instruments include the Convention on Biological Diversity Voluntary Guidelines for the consideration of Biodiversity in EIAs and SEAs in marine and coastal areas. Available at: https://www.cbd.int/doc/publications/imp-bio-eia-andseapdf; and the FAO International Guidelines for the Management of Deep Sea Fisheries in the High Seas. Available at: http://www.fao.org/docrep/011/i0816t/i0816t00.HTM

[157] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25(100), 2.

[158] IISD, above n 120, 11-14. See also IISD, above n 131, 9-12; and IISD, above n 111, 7-9.

assessments and to act as a central repository for reports and a clearing-house mechanism, similar to the one that applies under the CBD.[159] Procedural aspects of EIA/SEA and the role of the flag States and inter-governmental organisations, along with the relationship of the new agreement with the specific assessment requirements under other regional and sectoral instruments,[160] will require further consideration during the formal negotiations in the Intergovernmental Conference.

8.4.3.1 Recommendation of the PrepCom

On EIA, Part A of the recommendation states that drawing from article 206 of the Convention and customary international law, the text would set out the obligation for States to assess the potential effects of planned activities under their jurisdiction or control in areas beyond national jurisdiction including the relationship to EIA processes under relevant global, regional and sectoral instruments. Crucially, the text would address the procedural steps of an environmental impact assessment process, such as: screening; scoping; impact prediction and evaluation, using the best available scientific information, as well as descriptors, along with the use of traditional knowledge, public notification and consultation requirements. Based on ensuring consistency with articles 204 to 206 of UNCLOS, the text would set out the obligation in relation to monitoring, reporting and review, as well as the sharing of information with adjacent coastal States. UNCLOS of course is open to interpretation on the latter obligation. The text could address strategic environmental assessments.[161]

Part B provides that "further discussions are required on the degree to which the process should be conducted by States or be "internationalized", as well as on whether the instrument should address strategic environmental impact assessments."[162]

8.4.4 Investing in the creation of capacities and technology transfer

Capacity building on marine scientific research and the development and transfer of

[159] IISD, above n 157, 2.
[160] Long, Rodriguez Chaves, above n 89, 225.
[161] DOALOS, above n 112, 15, 16.
[162] DOALOS, above n 112, 20.

marine technology are key elements of UNCLOS.[163] Regrettably, as noted by Professor Tanaka, the implementation of the relevant provisions in UNCLOS remains insufficient from a practical perspective and creates significant challenges for developing States in implementing the Convention and deriving economic and environmental benefits from offshore resources.[164] There has, however, been some progress at the international level, including the adoption of the Intergovernmental Oceanographic Commission criteria and guidelines on the transfer of marine technology in 2003.[165] At the PrepCom discussions, a number of themes regarding capacity building and technology transfer were addressed, including the development of specific means to implement Parts XIII and XIV of UNCLOS through strengthening existing capabilities and capacities, as well as the improvement in funding, and greater engagement with public and private scientific bodies in the relevant specialist fields, such as genomics and ocean engineering technologies.[166] Additionally, the strengthening of human, scientific, technological, organisational and institutional resources as stipulated in the UNDP criteria on capacity building were acknowledged during PrepCom sessions.[167] Additionally, technology transfer should be based upon the Guidelines on the transfer of marine technology developed by the International Oceanographic Commission.[168] Such guidelines should be applied expansively to tools, equipment, criteria, protocols, samples, processes, software, methodologies and infrastructure.[169]

Significantly, many of the participants viewed scientific capacity and technology transfer as a *conditio sine qua non* of the BBNJ Agreement and as a crosscutting feature

[163] UNCLOS. Parts XIII, XIV.
[164] Y. Tanaka, *The International Law of the Sea,* 2 ed., (Cambridge: CUP, 2015), 370–375.
[165] UNCLOS. Article 271. See also: Intergovernmental Oceanographic Commission, 'Criteria and Guidelines on the Transfer of Marine Technology,' (Paris: UNESCO, 2005). Available at: http://unesdoc.unesco.org/images/0013/001391/139193m.pdf, and IOC (2016) *IOC potential contribution to a new international instrument under UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction*. Paris: UNESCO. (IOC/INF-1338).
[166] IISD (2016) 'Summary of the first session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(106), 14-16. See also: IISD (2016) 'Summary of the second session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(118), 13, 14; and IISD (2017) 'Summary of the third session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25 (129), 9-11.
[167] United Nations Development Programme (2008) Capacity Development Practice Note, 6. Available at: http://www.adaptationundp.org/sites/default/files/downloads/pn_capacity_development1.pdf
[168] Intergovernmental Oceanographic Commission, n 165.
[169] IISD, above n 120, 14.

in relation to the other elements of the package deal.[170] The adoption of 'meaningful and tangible measures' in the new instrument, the establishment of a global financing mechanism and an ad hoc body with responsibility for coordination and prioritisation of capacity building measures, as well as the implementation of technology transfer systems were other elements in consideration during PrepCom deliberations.[171]

8.4.4.1 Recommendation of the PrepCom

Part A of the recommendation indicates the BBNJ Agreement text would address the objectives of capacity building and the transfer of marine technology with a view to strengthening and operationalising relevant provisions in UNCLOS. In doing so, it "should recognize the special requirements under the instrument of developing countries, in particular the least developed countries, landlocked developing countries, geographically disadvantaged States and small island developing States, as well as coastal African States." In this context, specific reference is made to the IOC Criteria and Guidelines on Transfer of Marine Technology, the text could include an indicative, non-exhaustive list of measures, such as: "scientific and technical assistance, including with regard to marine scientific research for example through joint research cooperation programmes; education and training of human resources, including through workshops and seminars; and data and specialised knowledge. The text would also provide modalities in accordance with Parts XIII and XIV of the Convention. The text would elaborate on forms of cooperation and assistance in relation to marine genetic resources, including questions on the sharing of benefits, measures such as area-based management tools, including marine protected areas, and environmental impact assessments. It would make provision for a clearing-house mechanism to perform functions with regard to capacity building and transfer of marine technology, taking into account the work of other organisations. On the vital issue of funding, the text would address resources and related questions. The text would address the "issue of monitoring and review of the effectiveness of capacity- building and transfer of marine technology activities, and possible follow-up action.[172]

[170] Ibid. 15.
[171] Ibid. 15, 16.
[172] DOALOS, above n 112, 16, 17. All the indicated elements in this paragraph are contained in Section A. of the Recommendation.

Part B of the recommendation notes that "further discussions are required on the degree to which the process should be conducted by States or be "internationalized", as well as on whether the instrument should address strategic environmental impact assessments."[173]

8.4.5 Mainstreaming crosscutting issues

A crosscutting issues working group was undertaken at the PrepCom.[174] Thereafter, discussions of dispute settlement provisions in UNCLOS and the Fish Stocks Agreement and their applicability to disputes arising under the new instrument, as well as the necessity of establishing an objective liability regime in relation to activities that adversely impinge upon the conservation and sustainable use of biodiversity in ABNJ, was addressed under this working group during PrepCom meetings.[175] Other particular elements included in the deliberations of this working group were the scope of the BBNJ Agreement; relationship of the new instrument with UNCLOS and other instruments; objectives, guiding principles and approaches; institutional arrangements; review, monitoring and compliance; and final elements.[176]

8.4.5.1 Recommendation of the PrepCom

Part A of the recommendation provides that the text would set out institutional arrangements, taking into account the possibility of using existing bodies, institutions and mechanisms, including the establishment of a decision-making forum, a scientific technical forum, a secretariat, as well as a clearing house mechanism. The text of the implementation agreement would address financial issues relating to the operation of the instrument, compliance, along with dispute settlement provisions, such as those of the Charter of the United Nations and the Convention, along with provisions on responsibility and liability.[177]

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[173] DOALOS, above n 112, 21.
[174] IISD, above n 120, 17.
[175] Ibid. 19.
[176] Chair's overview of the third session of the Preparatory Committee. Preparatory Committee established by General Assembly resolution 69/292. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Chair_Overview.pdf. Appendix 5.
[177] DOALOS, above n 112, 17-20.

Part B notes that further discussions are required on institutional arrangements and the relationship between the institutions established under an international instrument and relevant global, regional and sectoral bodies, as well as how to address monitoring, review and compliance. With respect to funding, further discussions are also required on the scope of the financial resources required and whether a financial mechanism should be established, along with the questions pertaining to the settlement of disputes and responsibility and liability.[178]

8.5 SMALL STATE DIPLOMACY: PETITE SIZE BUT BIG INFLUENCERS!

The diplomatic arena encompasses a wide range of members, including small States that usually struggle, due to limited resources, to effectively participate in international forums and keep up-to-date their everyday tasks. However, as pointed out by Corigan, when charismatic topics are in the backbone of a small State's position, they could have palpable influence on the world stage and have an impact on events out of all proportion to their size. Nevertheless, small States cannot work miracles in the globalized world, which is still dominated by great powers, but they can strengthen the ability to focus on key goals, have better knowledge of the issues than larger powers, and an exquisite sense of when to act.[179]

The following paragraphs will briefly explore Costa Rica's background on becoming a recognised worldwide environmental leader, as well as the country's positions within the BBNJ negotiation process.

8.5.1 Costa Rica's Rich heritage on biodiversity protection

Costa Rica has been investing on the protection of its natural capital since the 1970s and has gained an international reputation for successful conservation policies.[180] The country has consolidated its recognition as a worldwide environmental leader through concrete actions, as almost a quarter of its land territory has been designated as protected areas under a variety of conservation and management regimes, including

[178] DOALOS, above n 112, 21.
[179] M. Corgan (2008) 'Small State Diplomacy,' *E-International Relations*, August 12th. Available at: http://www.e-ir.info/2008/08/12/small-state-diplomacy
[180] S. Evans (1999) 'The Green Republic: A Conservation History of Costa Rica,' *Journal of Political Ecology: Case Studies in History and Society*. Vol. 6, 1.

national parks, wildlife refuges, biological reserves, among others. Moreover, in 2012, 26.21 per cent of the Costa Rican national territory was protected in its continental extension[181] and 2.42 per cent of marine areas were under a category of protection.[182]

The country has been investing efforts on conservation and mostly focusing on land ecosystems on previous years. Furthermore, **"**Costa Rica overcame the tragedy of the commons and managed to bring forest cover from 21% in 1987 to 52% in 2016."[183] But how? In 1996 this small country initiated one of the first nationalised payments for ecosystem services programmes,[184] being a major conservation tool funded by fuel taxes, car stamp duties and energy fees.[185] In the early 1990s, this programme was perceived as an experimental instrument to reverse the high-speed deforestation rates taking place in the country. However, since then, nearly one million hectares of forest have been conserved by payments for protection, reforestation, sustainable management and regeneration.[186] Moreover, it has been highlighted that:

> Costa Rica's payment for ecosystems services programme has become something of an icon in the world of conservation. Its innovative blend of economic and regulatory instruments– and its hitches and successes – provide a valuable source of inspiration for other countries that are looking for effective ways to conserve and regenerate ecosystems.[187]

Currently, the country is in a mature state on managing this valuable programme, and one could wonder when the jump into payments for coastal and marine ecosystem

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[181] Sistema Nacional de Áreas de Conservación (2014) *Estado de la Conservación de la Biodiversidad en Costa Rica: Primer Informe Técnico del Programa de Monitoreo Ecológico de las Áreas Protegidas y Corredores Biológicos de Costa Rica*. Costa Rica: SINAC-PROMEC, 12.
[182] E. Salas, E. Ross, A. Arias (eds.), *Diagnóstico de áreas marinas protegidas y áreas marinas para la pesca responsable en el Pacífico costarricense* (Costa Rica: Fundación MarViva, 2012), 12.
[183] R. Grynspan (2017) 'Costa Rica a case of success,' El País, 7th May. Available at: http://economia.elpais.com/economia/2017/05/04/actualidad/1493916865_123722.html
[184] I. Porras, D. N. Barton, M. Miranda, A. Chacón Cascante, *Learning from 20 years of Payments for Ecosystem Services in Costa Rica* (London: International Institute for Environment and Development, 2013), 1.
[185] J. Watts (2010) 'Costa Rica recognized for biodiversity protection,' The Guardian, 25th October. Available at: https://www.theguardian.com/environment/2010/oct/25/costa-rica-biodiversity
[186] Porras, Barton, Miranda, Chacón Cascante, above n 184, 2.
[187] Porras, Barton, Miranda, Chacón Cascante, above n 184, 2.

services would take place.[188] Additionally, this Central American country has envisioned environmental protection as a guiding goal in its public policy, and has also activated judicial processes at the International Court of Justice, due to the violation of obligations under international environmental law in protected ecosystems by a neighbouring country.[189]

In summary, Costa Rica has succeeded in consolidating its international position as a conservation leader at regional and global levels. In advancing this role, the country is actively participating in international forums and steering discussions to move towards more ambitious schemes of conservation and sustainable use of biodiversity within and beyond national jurisdictions, as it will be seen in the following paragraphs. This has accorded fully with its international leadership approach to combatting the effects of climate change.[190]

8.5.2 Small champions leading ocean conservation: Costa Rica's participation in the BBNJ process

In line with the environmental background that Costa Rica has developed during the past decades, the country is no stranger in pushing international law-making processes advancing legal frameworks to protect biodiversity. Moreover, the country has actively participated during all the PrepCom sessions, addressing the elements of the package deal and the additional crosscutting issues.

In relation to the access of MGRs and benefit sharing, during the first session of PrepCom Costa Rica recalled that patents on MGRs have been issued in 31 countries, with 90 per cent of these patents belonging to only 10 technologically advanced countries.[191] Costa Rica also suggested extending the ISA mandate to cover MGRs, and for such Authority to develop codes for exploitation and exploration,[192] and assume the

[188] Some services derived from coastal and marine ecosystems are food provisions, recycling of nutrients, regulation of natural disasters, protection against floods, spiritual and cultural values, including recreation and tourism, among others. D. Whitmash, *Economic management of marine living resources: a practical introduction* (London: Earthscan, 2011).
[189] *Certain activities carried out by Nicaragua in the border area* (Costa Rica v. Nicaragua), Judgement I.C.J. Reports 2015, para. 47.
[190] Climate Action Tracker (2017) *Costa Rica*. Available at: http://climateactiontracker.org/countries/costarica.html
[191] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (99), 2.
[192] Ibid. 2.

responsibility for administering the benefit-sharing regime.[193] Likewise, in addressing gaps under UNCLOS, Costa Rica proposed that the implementation agreement should clarify that common heritage governs MGRs in all ABNJ.[194] Additionally, the country indicated some aspects to be taken in consideration in a future concept of MGRs, including genetic information from marine organisms with current or potential value, as well as economic value and ecosystem services, and highlighted that MGRs should cover marine organisms wherever they occur.[195]

During the second session of PrepCom, Costa Rica highlighted the definitions contained in the CBD, the Nagoya Protocol and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR), and more specifically, suggested a possible working concept of MGRs.[196] Later on, Costa Rica set forth two concept proposals, a general definition of MGRs[197] and a separate definition of MGRs and 'utilization' to be used in relation with MGRs,[198] including also the term of biotechnology.[199] In this line, the country proposed relying on the Nagoya Protocol definition of genetic resources including derivatives, and also addressing digital data.[200]

As a developing State, Costa Rica underscored that access to marine genetic resources should include *in situ*, *ex situ* and *in silico*, and indicated that benefit-sharing should include monetary benefits upon commercialization (supporting advance fixed-amount

[193] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (101), 2.
[194] Ibid.
[195] IISD, above n 157, 2.
[196] Costa Rica presented a submission on working concepts for further consideration in the BBNJ discussions, with the view to allow the participants to start from a similar understanding of the meaning of the elements being discussed. Specifically on MGRs, the working concept suggested by Costa Rica is the following: "material and/or data of marine plant, animal, microbial or other origin, derivatives and/ or data thereof found in or originating from the high seas or the Area, containing functional units of heredity with actual or potential value of their genetic properties." Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_BBNJ_Submission_GP2.pdf
[197] The general MGR definition proposed by Costa Rica is the following: "any living resources including of marine plant, animal, microbial or other origin, found in or originating from ABNJ and containing functional units of heredity, as well as any material derivatives and data thereof with actual or potential value." IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (110), 1.
[198] Ibid. MGRs as "any living resources including of marine plant, animal, microbial or other origin, found in or originating from ABNJ and containing functional units of heredity" and utilization of genetic resources as "conduct of research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology as defined in CBD Article 2 and in line with the Nagoya Protocol."
[199] Ibid.
[200] IISD (2017) 'PrepCom 3 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (125), 2.

payments or license fees, in addition to royalties), as well as non-monetary benefits (capacity building, technology transfer, among others). Also, Costa Rica proposed that criteria for curating samples should include a clearing-house mechanism with access to genetic data and a protocol to ensure environmental protection,[201] as well as traceability of MGRs and the further discussion on intellectual property rights (IPRs).[202] Finally, Costa Rica strongly supported others that fish should come within the scope of the provisions on marine genetic resources.[203]

Moving into the second element of the package deal, Costa Rica has proactively worked and participated to inform the ABMTs, including MPAs, deliberations. As a starting point, the country proposed that the BBNJ Agreement should include a list of scientific criteria for MPA establishment and a global mechanism to monitor, review and ensure compliance.[204] Moreover, it supported the definition of single-, multi- and cross-sectoral ABMTs, and recommended creating a global MPA network contributing to the overall objective of conservation and sustainable management of the marine environment.[205]

During the second session of PrepCom, Costa Rica suggested a working concept for ABMTs[206] and for MPAs the proposed working concept reads as follows: "a clearly defined geographic space recognized, dedicated and managed through legal and other effective means to achieve the conservation of biodiversity, ecosystem services and other cultural values."[207] Moreover, a proposal for the establishment process of MPAs was developed in a joint submission between Costa Rica and Monaco,[208] including the following key elements: indication of the MPA boundaries; evaluation of the current state of marine ecosystems; description of human activities or impacts; statement of long-term conservation objectives; elements of management measures; and a plan for

[201] IISD, above n 124, 2.
[202] IISD, above n 200, 2.
[203] Ibid.
[204] IISD , above n 191, 2.
[205] IISD, above n 193, 2.
[206] Costa Rica proposed the following working concept for ABMTs: "regulation of human activity and/or measures to achieve biodiversity conservation and sustainable use or resource management objectives in a specific area." IISD, above n 197, 2.
[207] Ibid. See also Costa Rica's submission on working concepts. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_BBNJ_Submission_GP2.pdf
[208] Costa Rica and Monaco joint submission on marine protected areas in ABNJ. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_Monaco_BBNJ_Submission_MPAs.pdf

monitoring and reviewing the MPA once established.[209] In addition to fulfilling these requirements, the suggested process includes: "States propose establishing ABMTs, including MPAs; a secretariat elicit comments from relevant entities about the potential to undermine their respective mandates and from other stakeholders, for the proponent to review; a scientific and technical body advise on the compatibility of potential MPAs with the ILBI scientific criteria, and assist in the identification of an MPA network, drawing input from scientific evaluations carried out by existing regional and sectoral organisations; and the ILBI COP consider adoption."[210]

Additionally, further details on the overall ABMTs, such as objectives; guiding principles; the process for establishing ABMTs including the submission of a proposal, the consultation and evaluation of the proposal, the ABMT designation, monitoring and review; have been presented by Costa Rica in another submission on the third session of the PrepCom.[211] In relation to institutional arrangements linked to ABMTs and MPAs, Costa Rica highlighted the need for a technical body advising on the compatibility of MPA proposals with best available science, and assisting in the creation of a network of representative MPAs, drawing from existing regional and sectoral organisations, while allowing for a review of measures.[212]

In regards to the third element of the package, EIAs and SEAs, both have been addressed by Costa Rica. The country has underscored the lack of specific rules and reporting mechanisms for EIAs under UNCLOS, and called for accessibility of information on BBNJ, including a repository. Costa Rica also recommended establishing the following particular elements: SEA obligations; objectives, clear and transparent criteria to conduct EIAs, processes based on best scientific evidence; minimum elements of EIAs;[213] and an oversight mechanism, ensuring monitoring, review and compliance with EIAs.[214] It has also proposed an indicative list of areas of cooperation between States and other partners, including international financial

[209] IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (114), 2.
[210] IISD, above n 197, 2.
[211] Costa Rica submission on area-based management tools in ABNJ. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/streamlined/Costa_Rica.pdf
[212] IISD, above n 209, 2.
[213] IISD, above n 157, 1.
[214] IISD, above n 124, 2. See also: IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (115), 1.

institutions, IGOs and NGOs.[215] Additionally, Costa Rica called for considering cumulative, as well as socio-economic, impacts of proposed activities, and called for obliging States to conduct EIAs and SEAs within their jurisdictions in case of potential impacts on ABNJ.[216]

During the second session of PrepCom, this small State proposed a working definition of EIA,[217] and emphasized the importance of public participation and consultations, as well as requiring that the environmental reports and results of public participation be taken into account in the proposed activity.[218] In relation to the EIA thresholds, the country suggested a non-exhaustive list subject to periodic review, including activities that are absolutely banned like nuclear or chemical waste dumping.[219]

Going into further details on how the EIA process might be structured, Costa Rica recommended a series of steps, as follows: "the activity proponent submit an application to the State; the State assess the activity's potential for harm in light of threshold criteria in the ILBI; if the criteria are met, the State be responsible for conducting EIAs and making the outcome publicly available; public consultation with all stakeholders, including existing organisations, be opened; an ILBI scientific committee review EIA outcomes and make recommendations; and an appeal process be created."[220] The State or the CoP should make a decision, which should be followed by a period for comments and by reporting and monitoring by the State, with oversight by the Scientific committee or the CoP.[221] During the third session of PrepCom, Costa Rica opposed the creation of a list of activities not requiring EIAs.[222]

In deliberations on the fourth element of the package deal, capacity building and technology transfer, Costa Rica has called for an indicative and non-exhaustive list of

[215] IISD, above n 157, 1.
[216] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (102), 2.
[217] Costa Rica suggested the following working concept of EIA: ""an appropriate procedure subject to a decision of a competent authority for evaluating activities or processes in the marine environment likely to have significant adverse effects on biodiversity with a view to avoiding or minimizing such effects." IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (111), 1. See also Costa Rica's submission on working concepts. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_BBNJ_Submission_GP2.pdf
[218] IISD, above n 217, 1.
[219] Ibid. 1.
[220] IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (112), 1.
[221] Ibid.
[222] IISD (2017) 'PrepCom 3 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (127), 2.

priority capacity building and technology transfer areas in the BBNJ Agreement, taking into account SDG 14 and its target, and the Addis Ababa Action Agenda on financing for development.[223] This idea was later reinforced by the country during the third session of PrepCom.[224]

The country, as have many others, also recalled that the IOC Criteria and Guidelines recommend making scientific and technological research results available to all. Likewise, it has suggested drawing on the CBD and national clearinghouse mechanisms [225] as virtual information-sharing mechanisms and a platform for coordination assisting Parties in the implementation of the BBNJ Agreement.[226] The country considered capacity building and technology transfer vitally important to enable developing States to conserve and sustainably use biodiversity in ABNJ, and proposed referring to the special needs of developing countries, including Small Island Developing States, Least Developed Countries, and middle-income countries. Costa Rica also recommended that capacity building and technology transfer be "responsive to national, local and regional needs, priorities and requests, with flexibility to adapt as needs and priorities change, and involving relevant stakeholders."[227]

Costa Rica has also favoured an online compilation of good practices, noting that financing for capacity building activities could be provided by a fund with voluntary contributions or through fines under the polluter pays principle.[228]

Exploring the last element addressed during PrepCom discussions, namely the cross-cutting issues, Costa Rica has envisioned key topics to be included in the BBNJ Agreement, such as: governance and institutional frameworks, funding mechanisms, dispute settlement, and regional and bilateral cooperation.[229]

As the deliberations in PrepCom advanced, other important elements were flagged to be considered in the development of the BBNJ Agreement. For example, Costa Rica has

[223] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (103), 2.
[224] IISD, above n 200, 125), 2.
[225] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (104), 2.
[226] IISD, above n 220, 2.
[227] IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (116), 2.
[228] IISD, above n 222, 1. See also: IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (117), 2.
[229] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (97), 2.

argued that the scope of the instrument includes fishing and all activities and processes with direct and indirect impacts on BBNJ. On overarching principles, this Central American country presented a written submission proposing which guiding principles should be included in the BBNJ Agreement,[230] and indicated the following: common but differentiated responsibilities; sustainable and equitable use of natural resources; availability of information; State liability for damage to the marine environment in line with the polluter pays principle, [231] and highlighted the common heritage as an overall guiding principle.[232] Costa Rica also noted that the duty to cooperate is considered international customary law.[233]

More specifically on institutional arrangements, Costa Rica has supported the establishment of a Conference of the Parties as a global body to monitor, review and ensure compliance; [234] a geographically balanced scientific or technical committee to take decisions binding on Parties,[235] as well as to give advice on ABMTs and EIA measures;[236] and a Secretariat, noting that DOALOS could play this role.[237] On the relationship of the BBNJ Agreement with existing instruments and bodies, Costa Rica has underlined the need to address existing gaps, while respecting mandates of other bodies, and harmonize requirements and standards to enable coordination. [238] Furthermore, the country emphasized that high seas freedoms are not absolute under UNCLOS and the *status quo* is no longer acceptable. [239]

Finally, in relation to responsibility and liability, Costa Rica and others have highlighted the necessity to prioritize preventive measures, with liability and responsibility provisions serving as a 'plan B' to address violations, reparations and mitigation.[240]

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[230] See Costa Rica's submission on overarching principles for the Preparatory Committee on BBNJ. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_BBNJ_Submission_GP.pdf
[231] IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (98), 2.
[232] IISD, above n 200, 2.
[233] IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (114), 2.
[234] IISD (2017) 'PrepCom 3 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (126), 1.
[235] IISD, above n 223, 2.
[236] IISD, above n 228, 2.
[237] IISD, above n 200, 2. See also: IISD, above n 193, 2.
[238] IISD, above n 228, 2.
[239] IISD, above n 124, 2.
[240] IISD, above n 234, 1.

8.6 APPRAISAL OF MULTILATERAL DEVELOPMENTS

New scientific studies have revealed the richness of biodiversity in ABNJ, as well as the escalating threats to the ecosystem services that these oceanic habitats provide, such as food security, oxygen production, regulation of global climate, carbon dioxide sequestration, primary productivity, tourism revenues, scientific knowledge, cultural and heritage values, among others. As seen above, increasing pressures on marine biodiversity in ABNJ pose significant regulatory and policy challenges to the long-term sustainability of multiple species and habitats. These include weak governance, overfishing and IUU fishing, which represent a global economic loss of approximately USD$ 50 billion annually in accordance to the FAO *Sunken Billions Report*. Additional challenges stem from pollutants from land, including discharges and emissions of hazardous substances, as well as marine debris, deep seabed mining, shipping, emerging uses like geo-engineering, and global pressures like ocean acidification, increase of sea-surface temperatures and subsequent changes in species geographical distribution.

Moreover, it is also patently clear on the policy and law side that existing conservation measures have not been successful. Notably, the regulatory framework and institutional architecture for the protection and use of biodiversity in ABNJ remains disparate, with limited competences of multilateral and regional bodies which make them unsuitable to tackle crosscutting governance and management issues, or effectively to address the cumulative effects of the various anthropogenic impacts on the marine environment. On the one hand, the whole governance architecture for the oceans as currently constituted appears to be unfit to address the aforementioned challenges in an effective manner. There has been some progress on the other hand within the international legal and policy agenda, such as agreement on the 2030 Agenda for Sustainable Development including more specifically Goal 14 as well as advancements on marine scientific research in deep-sea areas, like the ATLAS project. Arguably, the single biggest development on the legal landscape since the 1990s is the on-going negotiation process of a new legally binding instrument for the conservation and sustainable use of marine biodiversity in ABNJ.

Progress of the BBNJ Working Group was pedantic at best when it convened from 2006 to 2015 and produced a number of reports, technical papers and presentations on

issues relating to the conservation and sustainable use of marine biodiversity in ABNJ. In 2011 a major milestone was achieved, when this group agreed on four substantive elements to be addressed in further discussions, also known as the package deal, including: MGRs including questions on the sharing of benefits; measures such as area-based management tools, including MPAs; environmental impact assessments; and capacity building and the transfer of marine technology. A further boost on political momentum was achieved with Resolution 69/292. Likewise, the work of the Preparatory Committee is commendable even if the recommendation agreed to by consensus is stilted and lacks both conviction and innovative elements. AS seen above, there are many convergent and divergent elements in the PrepCom recommendation. Nevertheless, it achieves its primary political objective which is recommending that the UN General Assembly convene as soon as possible an Intergovernmental Conference to elaborate the text of the BBNJ legal instrument under UNCLOS.

The chapter also traced the role of small State diplomacy, and the part played by Costa Rica in particular, in forwarding an altruistic and constructive biodiversity agenda within the BBNJ process. This is largely reflective of Costa Rica's history and its foreign policy in relation to nature conservation more generally, as the country has been investing in the protection of its natural capital since the 1970s and has consolidated its recognition as a worldwide environmental leader through concrete actions including taking a lead in the climate negotiations that resulted in the 2015 Paris Agreement on Climate Change. Costa Rica has also established ground-breaking programmes such as the payment for environmental services, as well as the activation of judicial processes at the International Court of Justice due to the violation of obligations under international environmental law on protected ecosystems. All of these initiatives have contributed to this small country's reputation as an icon of best practice in the world of conservation.

Against this political backdrop, it is evident that Costa Rica conducted its diplomacy to pursue clear foreign policy objectives in relation to nature conservation, and to manage its leadership role within Latin and Central America. In parallel, it has actively engage with the High Seas Alliance in advancing matters of common concern at the PrepCom. When reviewed objectively, the approach appears to have been largely successful and bodes well for constructive methods of diplomacy in general, as well as proving the

premise that small States can still play a crucial role in advancing difficult environmental agendas within the global community of nations.

As seen above, within the BBNJ negotiation process, some highlights of the constructive contributions of Costa Rica extended to presenting various written submission, specifically on working concepts, overarching principles, and a joint submission with Monaco addressing key elements on the establishment of MPAs in ABNJ. Costa Rica's contributions also included the fourth PrepCom submission on ABMTs, including objectives; guiding principles; process for establishing ABMTs, among other matters. On the contentious issue of MGRs, Costa Rica, for well-grounded reasons, linked with its role as a developing country, supports the recognition of the common heritage of mankind as a guiding principle, as well as the development of monetary and non-monetary benefit-sharing regimes, and the importance of taking in consideration existing legal instruments such as the Nagoya Protocol and clearing house mechanisms. In regards to EIAs and SEAs, Costa Rica has identified significant issues to be taken in consideration, including: objectives, clear and transparent criteria to conduct EIAs, processes based on best scientific evidence; public participation and consultations, and an oversight mechanism.

On capacity building and technology transfer, Costa Rica's approach is again reflective of its role as a regional leader in so far as it considers that capacity building and technology transfer are vitally important to enable developing States to conserve and sustainably use biodiversity in ABNJ. On crosscutting issues, Costa Rica has highlighted key topics to be included in the BBNJ Agreement, such as: a broad scope including fishing and all activities and processes with direct and indirect impacts on BBNJ, governance and institutional arrangements, overarching principles, funding mechanisms, dispute settlement, responsibility and liability, and regional and bilateral cooperation.

One further general point can be made about small State diplomacy and the group system of negotiations that is a common feature of Law of the Sea negotiations. First, it is not yet evident how well the group system is playing out in the BBNJ negotiations and this will undoubtedly come into sharper focus in the forthcoming Diplomatic Conference. In considering its merits, it is pertinent to recall that Ambassador Tommy Koh, the President of the final session of UNCLOS III, has pointed out previously that

the UNCLOS "groups system" had both positive and negative attributes including enabling "countries to join forces with other countries with which they shared a common interest.[241] In this way, a country could acquire a bargaining leverage that it would not have had if it had operated alone. Clearly, there is much to be said in favour of Costa Rica's approach in that context. However, on the negative side, "once a group had adopted a common position, it was often difficult for the group to modify its position."[242] Any such chasm between Costa Rica and its regional partners will only become apparent during the cut and thrust of negotiations at the Diplomatic Conference. In the interim, Costa Rica provide leadership and influence further regional action to protect biodiversity in ABNJ if it continues actively participating in multilateral and regional discussions, and also raising awareness on the CRD initiative. In this context, the BBNJ negotiation process will certainly enhance and improve the legal back-up for such regional initiatives, addressing legal gaps as the elements of the package deal, and ensuring a more suitable framework for the consolidation of conservation and management measures in ABNJ. This is all the more significant terms of applying the ecosystem approach to species such as the leatherback turtles that migrate across maritime boundaries from the coastal zone to the high seas, thus requiring a protective regime across their entire migratory spectrum.

8.7 CONCLUSIONS

Deep ocean science is not ambivalent regarding the poor status of marine biodiversity and associated ecosystems, along with the adverse effects of climate change. The policy backdrop in the form of the 2030 Agenda on Sustainable Development is abundantly clear regarding the obligation to conserve and restore marine ecosystems. There thus appears to be sound scientific and policy reasons for the development of a legally binding instrument under UNCLOS to address conservation and sustainable use of biodiversity. From the BBNJ negotiations, however, it appears that there is no appetite to change any of the fundamental norms underpinning the Law of the Sea, such as initiating a moratorium on seabed mining, or indeed further codifying and strengthening the legal requirement to restore deep sea ecosystems. Moreover, the

[241] T.T.B. Koh, "Negotiating a New World Order for the Sea," in A. Henrikson, *Negotiating World Order: The Artisanship and Architecture of Global Diplomacy* (Washington: Rowman & Littlefield Publishers,1996), 42.
[242] Ibid.

pedantic pace of the BBNJ deliberations which have gone on now for well over a decade reveals that a radical reform of the institutional structures for managing the different sector activities in the ABNJ does not appear to be on the agenda for the Diplomatic Conference. Indeed, a notable feature of the PrepCom was the low participation of regional fisheries management bodies, as well as the absence of strategic thinking on convergence with other legal regimes including crucially those pertaining to climate change and human rights. Many of the constraints appear to be imposed by undue attachment to well-entrenched concepts and practice. As a result, much of the PrepCom negotiations were focused on the reiteration of well-known entrenched positions with little regard for the promotion of a robust and innovative legal framework. On the other hand, the PrepCom demonstrated willingness by the international community to take the agenda forward to the General Assembly, with a view to making a long-term contribution to the conservation and sustainable use of biodiversity of the oceans beyond national jurisdiction. Furthermore, in marked contrast to the common perception of legal realists, the influence of small States in the multilateral process remains paramount in the BBNJ negotiations as demonstrated by the role of Costa Rica in the PrepCom. They have a crucial role to play in successfully helping lead the process through the next stage, the Diplomatic Conference, where unflappability and inordinate amounts of patience will be critical to maintaining international consensus for agreement. From this perspective, small State diplomacy and the BBNJ regulatory developments at the UN can be viewed as symbiotic twin pillars supporting the rule of law in the protection of the marine environment and the resources it supports.

CHAPTER 9. PROTECTING AN OCEANIC OASIS: MOVING FROM *LEX LATA* TO *LEX FERENDA*

9.1 INTRODUCTION

This chapter provides an outline of *lex ferenda* and what a new regional instrument for the conservation and sustainable use of biodiversity in the areas beyond national jurisdiction of the CRD might look like in both form and substance. The discussion below is informed and based upon the analysis undertaken in previous chapters. Specifically, it takes into consideration the unique geographical, scientific and economic features of the CRD described in chapter 2, along with *lex lata* in the form of regional and multilateral agreements as outlined in chapters 3 and 4. The chapter stresses that a new Agreement would not operate in isolation, but will build meaningfully upon the various provisions and institutional arrangements that are already in place for the Eastern Central Pacific, including those reviewed in chapter 5.

The chapter draws upon international best practice as described in the five regional case studies (OSPAR Convention, Barcelona Convention, Antarctic Treaty System, Sargasso Sea Commission and the CPPS) set out in chapters 6 and 7, as well as the on-going developments at the United Nations under the *chapeau* of the BBNJ negotiation process, reviewed in chapter 8. Moreover, by focusing on how a regional model is the most apposite mechanism to discharge the *erga omnes* obligation to protect the marine environment and to conserve marine resources under international treaty and customary law, the discussion below accords with the ultimate element of proof that aims to demonstrate the hypothesis underpinning the thesis tendered in chapter 1 is correct. This of course accords with Lewis Alexander's rationale concerning the long-standing phenomenon of marine environmental enclosure and regionalization in the law of the sea, which has been elaborated upon by Professors Franck and Oral in the context of UNEP's Regional Seas Programmes.[1]

[1] L. M. Alexander (1974) 'Regionalism and the Law of the Sea: The Case of Semi-enclosed Seas,' *Ocean Development and International Law*, Vol. 2(2), 151. See also: E. Franck (1998) 'Regional Marine Environmental Protection Regimes in the context of UNCLOS,' *International Journal of Marine and Coastal Law*, Vol. 13, 307; and N. Oral, 'Forty Years of the UNEP Regional Seas

9.2 EXPLORING NON-REGULATORY AND LEGISLATIVE OPTIONS FOR THE PROTECTION OF THE CRD

The following paragraphs will address the modalities on how a new regional Agreement for the conservation and sustainable use of biodiversity in the ABNJ of the CRD could be proposed in the form of soft and hard law options.

9.2.1 Soft law

In recent years, there has been a proliferation of marine environmental instruments that have non-binding legal character and thus constitute soft law, such as the FAO Code of Conduct for Responsible Fisheries.[2] Soft law instruments lack legal character and are not readily enforceable. They come in various forms such as recommendations**,** code practice, guidelines, commitments, declarations, joint statements, resolutions by the United Nations General Assembly and other multilateral bodies including the regional seas bodies. Although these instruments are hortatory in nature, they serve important functions in so far as they are indicative of emerging legal trends in marine environmental law. They also sometimes evolve or crystallise subsequently into binding legal obligations or in the words of Professor Lowe, have the potential to "form the building blocks of international treaties."[3]

As seen in chapter 7, a pertinent example of soft law analysed in this thesis is the Hamilton Declaration, which calls for the effective collaboration in pursuing conservation measures for the Sargasso Sea ecosystem in the ABNJ. This soft law approach has inherent strengths in so far as it allows for the development of a *sui generis* regulatory regime, the creation of institutional arrangements and the advancement of political engagement in relation to the protection of the environment. In tailoring an appropriate regime for the CRD, however, it should be kept in mind that the history of soft law instruments in Central American has suffered from a systemic lack of effectiveness due to the absence of political support and suitable resources to

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Programme: From past to future' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 339.

[2] Chapters 3 and 4.

[3] V. Lowe, *International Law: A Very Short Introduction* (Oxford: Oxford University Press, 2007), 37.

implement such instruments. This undoubtedly tilts the scale towards the adoption of a hard law instrument for the CRD, as it will be explored in the following paragraphs.

9.2.2 Hard law: Why regulate with a regional instrument of binding legal character?

There are compelling scientific, economic and legal reasons that support the view that the protection and sustainable use of biodiversity in the CRD cannot be resolved at national levels by the coastal States in Central America or from further afield without further action at the regional and transboundary levels, particularly when it comes to the ABNJ.[4] Scientifically speaking, given the environmental continuum that extends from coastal ecosystems to ABNJ, there is a need to match ecological connectivity with the rights and duties that arise in the different maritime jurisdictional zones both within and beyond national jurisdiction. In parallel, there are pressing legal reasons why the unique biodiversity associated with the CRD ought to be protected, including the inadequacy of existing multilateral and sector-specific regional instruments in providing a robust conservation regime as seen in chapters 3-4. These reasons also include economic efficiency arguments relating to the loss of biodiversity services highlighted in chapters 2 and 8, as well as the avoidance of conflicts over the use of natural resources and environmental protection. In short, biodiversity in both ABNJ and in transboundary contexts requires international protection. Regulation in the form of a regional Agreement will also bring the various actors together in decision-making institutional bodies that discharge management, scientific and compliance functions. This will also improve clarity and certainty regarding the right and duties of States Parties and other entities including stakeholders. Furthermore, it ought to be noted that developments in regional law in relation to the marine biodiversity in ABNJ may influence the development of the laws and policies of the coastal States in Central America.

Following on from the aforementioned, the following discussion sets out a proposal for the establishment of a regional conservation and management framework for the CRD, taking into consideration the lessons that are derived from the five case studies addressed in the present study in chapters 6 and 7, as well as the existing legal and

[4] G. Hardin (1968) 'The tragedy of the global commons,' *Science*. Vol. 162, 1243.

institutional frameworks at multilateral, sector and regional levels as explored in chapters 3-5.

9.2.2.1 Hard law modalities for the development of a CRD Agreement

A legally binding instrument[5] for the ABNJ of the CRD should aim to ensure the conservation, sustainable use and restoration of the marine environment and its associated biodiversity. The instrument should also aim to engender comprehensive cross-sectoral regional collaboration to ensure the long-term sustainability of the living and non-living resources in marine areas beyond national jurisdiction[6] of the CRD ecosystem.[7]

There are two obvious regulatory options that can be explored in the development of the new CRD instrument. The first alternative is the expansion of the North-East Pacific Regional Seas Programme in the form of the UNEP Antigua Convention, both in regional and material scope, as discussed in chapter 5. The second option is the development of a new discrete regional instrument for the ABNJ of the CRD. As highlighted previously, the first approach will encounter difficulties due to the lack of political will and commitment to ratify this instrument since its adoption in 2002. Fifteen years has passed and the UNEP Antigua Convention is not yet in force. Furthermore, the instrument is somewhat dated and not an appropriate platform to address the challenges of biodiversity conservation in ABNJ and other related issues such as climate change, scientific data deficit and effective stakeholders' involvement in decision-making and compliance functions. A number of other reasons mitigate against this solution. First, the UNEP Antigua Convention has broad material scope, mainly addressing the prevention of marine pollution and land-based source pollution.

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[5] D. Bodansky, *The Art and Craft of International Environmental Law* (Cambridge: Harvard University Press, 2010), 6.

[6] CPPS. Galápagos Commitment for the XXI Century. VIII Meeting of Ministers of Foreign Affairs. Galápagos, Ecuador, 17 August 2012. Para. 20. See: G. Wright, J. Rochette, E. Druel, 'Marine protected areas in areas beyond national jurisdiction' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 285.

[7] The effectiveness of an international regime is a function of three factors: (1) the ambition of its provisions; (2) the level of participation by states; and (3) the degree to which states comply. D. Bodansky (2015) 'Legally binding versus non-legally binding instruments,' forthcoming in S. Barrett, C. Carraro, J. de Melo (eds.), *Towards a Workable and Effective Climate Regime* (VoxEU eBook).

In marked contrast, the CRD Agreement will be focused first and foremost on the conservation and sustainable use of marine biodiversity. Secondly, in relation to geographical scope, the UNEP Antigua Convention is only applicable to the jurisdictional waters of its member States. In contrast, the CRD Agreement will be applicable to the ABNJ of the CRD. Thirdly, on governance arrangements, the UNEP Antigua Convention calls for the establishment of a meeting of the Parties and a Secretariat, which have yet to convene due to financial constraints.[8] The CRD Agreement, as will be seen in subsection 9.3.7 of this chapter, would have a slim but innovative institutional structure, including a meeting of the Parties, a Commission, a Scientific Committee, a Compliance Committee, and if necessary, specific working groups. Additionally, the active involvement of stakeholders within the institutional arrangements of the CRD is a progressive and defining feature that will differentiate the new structures from the UNEP Antigua Convention arrangements.

In summary, the new CRD Agreement will be a discrete instrument focused on addressing the conservation, sustainable use and restoration of marine biodiversity and ecosystems in the ABNJ of the CRD. As will be seen further below, the instrument will also be tailored to the reality of the Central American region, and will harmonize cooperation and collaboration mechanisms, while complementing existing instruments related to the different uses and activities taking place in the CRD. In relation to the global agenda, the CRD Agreement will complement and implement the obligations arising under the BBNJ Agreement under negotiation at the United Nations, as summarised in chapter 8. Moreover, in the regional context, the CRD Agreement will sit comfortably beside the UNEP Antigua Convention. If there is sufficient political appetite another option would be to adopt the CRD Agreement as a Protocol to the UNEP Antigua Convention. Once the latter comes into force, after its ratification by four countries, both instruments could merge to comprehensively address the conservation and sustainable use of biodiversity and the marine environment both within and beyond national jurisdiction, following perhaps the steps outlined in the OSPAR case study in chapter 6. In either case, whether a stand-alone instrument or as a Protocol to the UNEP Antigua Convention, the new instrument would not overrule any

[8] UNEP. *First Intergovernmental meeting of the Plan of Action of the Convention for cooperation in the protection and sustainable development of the marine and coastal environment of the North-East Pacific. Guatemala, 19-22 February 2002*. Available at: http://drustage.unep.org/regionalseas/sites/unep.org.regionalseas/files/documents/nep_IGM1_EN.pdf VIII. Financial arrangements.

obligations under other Treaties, thus, not derogating from any of the rights and obligations of the Parties derived from existing international treaties, such as the Convention of Biological Diversity, CITES, CMS, and the many others analysed in chapters 3, 4 and 5 of the present study.

9.3 ADVANCING ABNJ CONSERVATION: CONSTITUENT ELEMENTS OF THE CRD AGREEMENT

Clearly it is beyond the scope of this chapter to present an exhaustive analysis of all of the substantive provisions of a CRD Agreement including its preamble. Nonetheless, the remainder of the chapter will address some of the core constituent elements based upon the analysis undertaken in previous chapters of this study. The relevant elements are not exhaustive but should include all of the following: objectives; scope (material, geographical, personal, temporal); general principles and approaches; adjacency; protection of vulnerable species; protection of the CRD marine ecosystem; area-based management tools (EBSA, MPAs, VME, PSSA, APEI); institutional arrangements including a Meeting of the Parties, the CRD Commission, subsidiary bodies (Scientific Committee, Compliance Committee, Coordination Units, working groups) and observers; action plan; marine scientific research; capacity building and technology transfer; compliance, enforcement and stakeholder engagement; dispute settlement; and responsibility and liability.

9.3.1 Objectives

Objectives set down the purpose of a legal instrument. In indicating the general subject-matter regulated and the substantive content of the obligations that arise under the instrument, objectives vary enormously and are widely used in all marine environmental treaties, where they perform a disparate array of roles, such as guiding the interpretation of a legal instrument, providing a parameter to review the effectiveness of normative provisions,[9] or directing Contracting Parties in adopting

[9] C. McGrath, 'The role played by policy objectives in environmental law,' in D. Fisher (ed.) *Research Handbook on Fundamental Concepts of Environmental Law* (Cheltenham, UK: Edward Elgar Publishing, 2016).

concrete implementation measures.[10] Furthermore, the objectives of the CRD Agreement will make the new instrument adaptive and flexible enough to address future advancements in scientific knowledge, the acquisition of new environmental and biodiversity data, as well as a means to regulate emerging uses, activities and circumstances, which may not be the focus of a specific rule in the substantive provisions of the new Agreement.

As UNCLOS does not preclude further developments of its provisions or jurisdictional regime, as long as its key principles are respected and maintained,[11] some international and regional instruments on biodiversity conservation and sectoral activities in ABNJ, examined through chapters 3 to 7, have developed a variety of objectives, from which four general strands can be derived and incorporated into the new instrument.

The first and overall objective governing the CRD Agreement should be the conservation of marine biodiversity in the ABNJ of the CRD. In a similar approach followed by regional agreements such as CCAMLR, OSPAR and the Madrid Protocol, the general objective and the following substantive provisions of the CRD Agreement would be an over-arching framework to achieve and maintain a favourable conservation status for the CRD ecosystem and its associated biodiversity, the good quality of its habitats, and the use of the CRD for peaceful purposes.[12] Essentially this approach goes to the heart of the hypothesis as stated chapter 1, which is the urgent need to establish a regional Agreement for the protection of biodiversity in the ABNJ of the CRD with a strong conservation objective to ensure the sustainability of the Dome and its associated biodiversity.

A second general objective to be developed in the new Agreement is the sustainable use of marine resources and biodiversity from the CRD as a core element consolidated in international environmental law. In this line, and as seen in chapter 2, the CRD provides multiple goods and services to the Central American countries, and also to other States beyond this region, supporting local and regional economies, as well as the welfare and quality of life of many people in different sectors, namely: fishing, tourism

[10] H. Ringbom, T. Henriksen (2017) *Governance challenges, gaps and management opportunities in Areas Beyond National Jurisdiction*. Washington: Global Environment Facility, 75.
[11] Ibid. 86.
[12] Chapter 7. Antarctic Treaty. Recital 2, 4.

and navigation. Additionally, the CRD has an economically quantifiable aspect in terms of the provision of ecological services, as it provides a critical ecosystem for multiple species and also has a fundamental role in carbon sequestration and in regulating the climate. Therefore, ensuring the long-term sustainability of the CRD is fully in line with Goal 14 of the SDGs. [13]

The third objective to be included in the new Agreement is the ecological restoration of the CRD, which encompasses the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed.[14] The prevention of biodiversity loss and marine ecosystem damage should remain the key goal. However, unfortunately, conservation alone is no longer sufficient to ensure the health and the productive functioning of marine ecosystems.[15] Thus, ecological restoration has been developed through soft law[16] and hard law[17] in some of the Conventions and regional frameworks examined in chapters 3, 4 and 6 of this study, with the view to conserve marine ecosystems and restore marine areas adversely impacted by anthropogenic activities, as well as to recover habitats and threatened species through the development and implementation of management strategies.[18] In the particular case of the CRD, this objective entails a long-term approach, foreseeing the possible degradation of this unique ecosystem, partially or as a whole, and the subsequent duty to restore such habitats. Nevertheless, it must be acknowledged that given the lack of a solid baseline of environmental data in regards to the CRD, the challenge posed by the absence of appropriate baseline data and uncertainty regarding the historical trajectory could hinder the effectiveness of future restoration efforts. As seen in chapter 8, this is significant, as ecological restoration has not been included by the Preparatory Committee as an objective of the BBNJ Agreement.

[13] Chapter 3. SDG 14, Target 14.c.
[14] C. Van Dover et. al. (2014) 'Ecological restoration in the deep sea: Desiderata,' *Marine Policy*, Vol. 44, 98-106.
[15] R. Long (2016) 'Opportunity for paradigm change: Establishing a normative basis for marine ecological restoration in ABNJ,' *Stress testing the Law of the Sea: Dispute resolution, disasters and new challenges*. London: Kings College/LOSI Berkeley, 1 October 2016.
[16] Aichi Biodiversity Targets 14 and 15 of the Strategic Plan for Biodiversity 2011-2020; SDG 14, Targets 14.2, 14.4; UNCSD Rio+20, The Future We Want, para. 4, 40, 154, 158, 193, 201, 206, 207; CBD COP Decisions IX/5, IX/18, X/31, XI/16 on ecosystem restoration, and the Hyderabad Call for a concerted effort on ecosystem restoration. Ibid.
[17] Ibid. See also: UNCLOS. Articles 192, 194(5), 197, UNCLOS 1994 Implementation Agreement, UNFSA. Articles 5(e), 6(4), Annex II Article 4, and OSPAR Convention.
[18] CBD Convention. Article 8 (f)(e).

The fourth objective aims to advance international cooperation and coordination among multilateral, regional, sectoral and national bodies, with a view to ensuring the achievement of the overall objective of conservation and sustainable use of marine biological diversity of the CRD. The substantive text of the Agreement should elaborate the content and modalities of the obligation of international cooperation.

9.3.2 Scope of the new Agreement

The CRD is located in the Eastern Tropical Pacific, and straddles areas that are both within and the jurisdiction and sovereignty of several Central American countries. The uniqueness of this oceanographic feature, and the need for regional protection of its biodiversity in ABNJ, pose some legal particularities in regards to the range of application of the new Agreement, and for that reason, the overall scope of such instrument should be addressed in four dimensions, namely: geographical, material, personal and temporal.

Firstly, in regards to the geographical scope, and taking into consideration the lessons gained from the case studies addressed in chapters 6 and 7, the CRD Agreement will be applicable to the ecosystems and biological diversity of the areas beyond national jurisdiction, including the high seas and the Area, of the Costa Rica Dome.[19] Nevertheless, an additional reference to adjacency should be made at this point. This topic will be explored further below in this chapter, but for now it must be borne in mind that there are existing obligations of States to pursue protection of the marine environment in both EEZs and ABNJ, under UNCLOS and other multilateral agreements that recognise the ecological connectivity, between ocean resources and biodiversity that transcends maritime jurisdictional boundaries.[20]

In relation to the material scope, and taking into account successful experiences such as CCAMLR, the new Agreement would be applicable to activities and processes in the ABNJ of the Costa Rica Dome, and in adjacent areas that may cause adverse impacts to the favourable conservation status of the marine environment.[21] As seen in chapter 2,

[19] Chapter 6. OSPAR Convention. Article 1 (a). Barcelona Convention. Article 1.
[20] D. Dunn, et. al., (2017) *Adjacency: How legal precedent, ecological connectivity and traditional knowledge inform our understanding of proximity*. Japan: Nippon Foundation - Nereus Programme, 6.
[21] Chapter 7.

examples of such activities and processes that could be included within the material scope are: conservation, fishing, tourism, maritime transportation, energy, seabed mining, scientific research, access to marine genetic resources, environmental impact assessments, as well as emerging uses such as geo-engineering and other forms of carbon sequestration technologies.

In regards to the personal scope, the CRD Agreement will apply to flag States, port States and coastal States, following the scheme contained in UNCLOS and other multilateral Agreements, which have set obligations of States to pursue the protection of the marine environment in both jurisdictional waters and in ABNJ.[22] A main goal in addressing the personal scope of the new CRD Agreement should be to enhance the ability of flag States, coastal States and port States to implement their rights and obligations[23] on conserving marine biodiversity in ABNJ.[24] New alternatives like considering 'market States' in the personal scope of the CRD new regional instrument could be further analysed, specifically in regards to conservation measures addressing market tools and instruments, similar to the scheme developed under CITES. However, the latter is beyond the scope of the present thesis.

Finally, as seen in chapter 2, the ambulatory nature of the CRD caused by the interaction of coastal winds and marine currents, results in considerable variations in the Dome's geographical location and magnitude during the year.[25] The new instrument could incorporate a temporal scope in correlation with the annual cycle of the CRD.[26] Thus, as the boundaries of the CRD are at their widest extension from July to November every year, temporal measures could be put in place during that period to comprehensively address conservation action lines in the CRD. Nevertheless, the changing conditions of the ocean due to climate change and extreme El Niño events impacting the Eastern Tropical Pacific could pose management challenges, and the patterns of the CRD annual cycle could be drastically modified. The CRD Agreement

[22] Ibid. See also: R. Warner (2017) 'The connected legal seascape of areas within and beyond national jurisdictions,' *Side event at the Third Session of the BBNJ Preparatory Committee*. March 26 – April 7, United Nations Headquarters.
[23] Ringbom, Henriksen, above n 10, 14.
[24] Ibid. 13.
[25] P. C. Fiedler (2002) 'The annual cycle and biological effects of the Costa Rica Dome,' *Deep Sea Research I*, Vol. 49, 331.
[26] J. A. Jiménez, *The Thermal Dome of Costa Rica: An oasis of productivity off the Pacific coast of Central America* (San José, Costa Rica: MarViva, 2017), 17.

could adopt a similar adaptive management approach to address in line with the scheme under consideration for the Sargasso Sea as discussed in chapter 7.

9.3.3 General principles and approaches

The value of normative legal principles is well documented in the academic literature and clearly evident in all of the regional case studies reviewed in this thesis, as well as in marine environmental treaty and customary law more generally.[27] Moreover, several marine environmental principles have received the imprimatur of international courts and tribunals including the ICJ and ITLOS.[28] That said, a central aspect of the hypothesis advanced in chapter 1 is that regional arrangements to protect biodiversity are required to address lacunae in multilateral and sector instruments, which is very much the case in relation to the current absence of appropriate cross-sector environmental principles and approaches applicable to marine resource management and environmental protection in ABNJ more generally and the CRD in particular. Therefore, a core function of the CRD Agreement is to address this shortcoming and to provide a robust armoury of normative principles that guarantee inter-linkages between the fundamental objectives of sustainable use and conservation under the new treaty with the broader institutional and compliance mechanisms underpinning the regional governance arrangements for ABNJ in the Eastern Central Pacific Ocean.

From a practical operational perspective, there needs, however, to be absolute clarity in the CRD Agreement on the distinction between the obligations that arise under legal principles and scientific approaches to marine resource management such as the ecosystem approach, in view of the fact that the precise normative weight of the latter may be less clear than the legal principle that meets the requirements of Article 38(1)(c) of the Statute of the International Court of Justice.[29] The unique geographical context and biodiversity of the CRD explored in chapter 2 is of course crucially important in

[27] Chapters 3-4, 6-7.

[28] On the duty to cooperate in the protection of the marine environment, see, for example, *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, ITLOS Case No. 17 (Advisory Opinion) [2011] ITLOS Rep 10; *The MOX Plant Case (Ireland v United Kingdom)*, ITLOS Order 2001/5 of 13 November 2001; *Definition of the minimum access conditions and exploitation of fisheries resources within the maritime zones under the jurisdiction Sub-Regional Fisheries Commission (SRFC) Member States,* ITLOS Case No. 21 (Advisory Opinion) 2015. Para. 120.

[29] P. Sands, J. Peel, *Principles of International Environmental Law* (Cambridge: Cambridge University Press, 2012) 3rd ed.

the application of principles and approaches in practice. Additionally, it ought to be noted that principles and approaches are crosscutting in ambit and should therefore inform all substantive provisions of the putative CRD Agreement. What is more, some principles and approaches ought to be fleshed out in considerable detail in substantive provisions of the CRD Agreement, similar to the provisions on the precautionary approach in the UNFSA or indeed the ecosystem approach under the CCAMLR Agreement.[30] Likewise the no net loss of biodiversity and the mitigation hierarchy discussed in chapter 8 are both scientific approaches to marine environmental management and may thus best be addressed in specific provisions of the CRD Agreement such as those on Environmental Impact Assessments, Strategic Environmental Assessments and Transboundary Impact Assessments.

The reason for having a very solid juridical basis in the CRD Agreement for the application of principles and approaches is self-evident and will undoubtedly help the new instrument remain malleable enough to deal with new scientific knowledge about the environmental risks posed to biodiversity within the region and which may not be covered by the substantive rules set out therein. In such cases, matters not covered by a specific rule in the CRD Agreement may well be governed by a general principle. This is relevant given the susceptibility of the CRD to spatial-temporal changes in light of the effects of climate change, as well as the multiple jurisdictional challenges faced in managing the anthropogenic impacts of different sectors on highly migratory species such as cetaceans and leatherback turtles, as seen in chapters 2, 4 and 5. In such instances, principles are invaluable in interpreting and expanding the scope of application of the legal obligations borne by States and international bodies with a view to achieve the objectives of conservation and sustainable use of biodiversity.

For obvious compelling reasons, as a minimum, and drawing from the comparative case studies, the CRD Agreement ought to reflect the list of principles and approaches codified in relevant multilateral, regional and sector agreements, as outlined in chapters 3-5, including codifying the *jus cogens* status of the common heritage of mankind in relation to the Area of the CRD.[31] Moreover, taking into account the multiple uses of the Eastern Central Pacific Ocean and the ambulatory nature of the boundaries of the CRD, many, if not all, of the 10 IUCN Principles for High Seas Governance should be

[30] Chapters 3 and 7.
[31] UNCLOS. Article 136.

embedded and operationalized within the CRD Agreement.[32] In doing this, the principle of good faith, *pacta sunt servanda*, should pervade all aspects of the CRD Agreement. Likewise, the protection and preservation of biodiversity and the marine environment, the sustainable use of the components of biodiversity,[33] as well as the maintenance and restoration of ecosystem integrity in the CRD,[34] shall be included as peremptory pillars that inform the implementation of the CRD Agreement. As seen in chapters 3-7, this will accord with best practice under international environmental law and the law of the sea including a wide array of multilateral instruments such as UNCLOS, CBD, the UNFSA, as well as many of the regional agreements reviewed in the case studies.

In parallel, the duty to cooperate should be elevated to a legal principle in line with the *dictum* of Judge Wolfrum in the *Mox Plant* case, who described it as a *Grundnorm* of marine environmental law.[35] Similar to the approach followed in the regional seas agreements such as CCAMLR, OSPAR and the Madrid Protocol,[36] the substantive provisions of the CRD Agreement will add substance and flesh out in further detail the precise obligations for Contracting Parties and other entities, including international organisations that arise under this duty. In this context, it should be borne in mind that a key objective of the CRD Agreement is to strengthen mechanisms for cooperation and coordination[37] between States and regional and multilateral bodies, in exercising their

[32] IUCN (2008) *10 IUCN Principles for High Seas Governance*. Available at: (https://cmsdata.iucn.org/downloads/10_principles_for_high_seas_governance___final.pdf
[33] See *inter alia* the discussion in chapters 3 and 4 of Article 1 Convention of Biological Diversity, Articles 2 and 5(h) Fish Stocks Agreement, Article 7.2.1 FAO Code of Conduct.
[34] R. Long (2017) 'The Legal Duty to Restore Marine Ecosystems in International and European Union Law,' *Ecology Law Quarterly* (forthcoming).
[35] See ITLOS MOX Plant case, above n 28. Separate Opinion of Judge Wolfrum.
[36] Antarctic Treaty. Article 9(1). See: UNEP/EC (2015) 'Cooperation between UNEP MAP-Barcelona Convention and FAO-GFCM,' *Workshop on regional ocean governance*. Belgium, 9–10 November. See also: OSPAR Commission. Agreement 2014/09. Collective Arrangement between competent international organisations on cooperation and coordination regarding selected areas in ABNJ in the North-East Atlantic.
[37] Some examples of collaboration mechanisms developed within the different regional frameworks analyzed in chapters 6 and 7 of this thesis are: cooperation in the collection of environmental data, cooperation on marine spatial planning, share and flow of information, establishment of reciprocal observer arrangements, reciprocal communications and consultations and designation of focal points for coordination between organisations, among others.

respective competencies in relation to anthropogenic impacts that impinge upon biodiversity.[38]

In line with its status as a fundamental principle of environmental protection in customary and treaty law,[39] the CRD Agreement should codify the principle of *sic utere tuo ut alienum non laesas*, commonly called the no harm principle.[40] Furthermore, in accordance with the advisory jurisprudence of ITLOS,[41] the obligation of exercising due diligence in avoiding trans-boundary damage ought to be embedded in the substantive provisions of the CRD Agreement and linked with the obligation of applying best environmental practices and techniques, such as the requirements of adopting environmental strategies and programmes as seen previously in the context of OSPAR in chapter 6.

The preventative principle ought to inform the regulation of all activities that adversely impinge upon the marine environment of the CRD.[42] Again similar to OSPAR,[43] the precautionary principle ought to be at the heart of the CRD Agreement with a view to guiding the conduct of Contracting Parties in decision-making processes and in the development of conservation and management actions. Accordingly, where there are threats of serious or irreversible damage, lack of full scientific certainty must not be used as a reason for postponing cost-effective measures to prevent environmental degradation in the CRD. A framework for this principle's application and operationalization should be developed, akin to relevant provisions in the UNFSA as seen in chapter 4. This is quite crucial in light of the lack of knowledge and the great uncertainty that still exists about the biodiversity associated with the CRD as briefly outlined in chapter 2.

Equally important, States and international organisations must cooperate to apply

[38] Chapters 6 and 7 include several examples in coordination agreements and MoU between multilateral bodies and regional frameworks.
[39] Article 194(2) UNCLOS; *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, ICJ Reports 1996. Para. 29.
[40] Y. Tanaka, 'Principles in Marine Environmental Law' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015), 37, 38.
[41] *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, ITLOS Case No 17 (Advisory Opinion) [2011] ITLOS Rep 10.
[42] Gabčíkovo -Nagymaros Project (*Hungary v Slovakia*), Judgment, ICJ Reports 1997, 78. Para 140.
[43] Chapter 6.

ecosystem-based management in the CRD through an integrated approach, in which decision-making processes, within and across sectors, safeguard the CRD marine ecosystem and its associated biodiversity, and ensure its long-term conservation and sustainable use. This approach should be applicable to the management of human activities that may affect the marine environment of the CRD.[44] The duty to implement an integrated ecosystem approach when adopting conservation and management ought to follow the methodologies developed and applied by OSPAR and CCAMLR.[45] Notably, the ecosystem approach methodology adopted pursuant to the Barcelona Convention could also be replicated in the CRD, in so far as it includes relevant elements such as the identification of important ecosystems and assessment of ecological status, the development of ecological and operational objectives with indicators, as well as timelines and roadmaps for their implementation with a view to achieving favourable conservation status of the biodiversity associated with the CRD.[46] The precise legal implications of the principle to protect and preserve the marine environment has been elaborated upon in the jurisprudence of international courts and tribunals, which have concluded that the conservation of the living resources of the sea is an element in the protection and preservation of the marine environment,[47] including measures focused primarily on the conservation and the preservation of ecosystems,[48] as well as "the prevention of harms that would affect depleted, threatened, or endangered species indirectly through the destruction of their habitat."[49] This interpretation leans towards ecosystem-based management in applying and implementing UNCLOS obligations and other normative principles. Finally, the application of the ecosystem approach will have to be applied on the basis of the consent of the coastal States to marine resource management in areas within national jurisdiction, where Central American countries have yet to delimit their maritime boundaries between opposite and adjacent coasts, or indeed to delineate the outer

[44] UNEP Decision IG 17/6. Implementation of the ecosystem approach to the management of human activities that may affect the Mediterranean marine and coastal environment. Recital 6.
[45] OSPAR Commission. Statement on the Ecosystem Approach to the Management of Human Activities. First joint Ministerial meeting of the Helsinki and OSPAR Commissions. Bremen, Germany. June, 2003. Para. 5. See also: CCAMLR Convention. Article 2(3).
[46] UNEP, above n 44. Recital 7.
[47] *Southern Bluefin Tuna (New Zealand-Japan, Australia-Japan)* ITLOS Case No. 3, 4 (Advisory Opinion) 2000. Para 70. See also: ITLOS, SRFC Advisory opinion, above n 28, para. 120.
[48] *Chagos Marine Protected Area Arbitration (Mauritius v. United Kingdom)*, Permanent Court of Arbitration Case No. 2011-03 (Inter-State arbitration) 2015. Para. 538
[49] *The South China Sea Arbitration (The Republic of Philippines v. The People's Republic of China),* Permanent Court of Arbitration Case No. 2013-19 (Inter-State arbitration) 2016. Para. 945

limits of the continental shelf in accordance with Article 76 of UNCLOS.[50]

Other relevant principles that ought to be codified in the CRD Agreement and guide its implementation are the axioms of using the best available science and technology in decision-making processes.[51] The conservation of marine biodiversity and the integrity of ecosystems in ABNJ must be enshrined as the common concern and the collective responsibility of all States, *erga omnes*. Following from this, Contracting Parties to the new CRD Agreement will act as stewards on behalf of present and future generations in their management of marine resources and activities adversely affecting the biodiversity in the CRD. A quick trawl through the multilateral and regional instruments explored in chapters 3-5, as well as the regional case studies reviewed in chapters 6 and 7, suggest that the following should also be included: the polluters pay principle;[52] prior impact assessment;[53] common but differentiated responsibilities;[54] adaptive management;[55] non-regression;[56] good governance, including transparency; public participation in decision-making; and access to environmental justice.[57] The latter is essential for informed and responsive decision-making that considers all three pillars of sustainable development. Similar to the UNFSA as explained in chapter 4, in giving effect to the duty to cooperate under the CRD Agreement and UNCLOS, one of the guiding principles should place an express obligation on States and other legal entities to implement and enforce conservation and management measures through effective monitoring, control and surveillance. Moreover, in doing so, the CRD Agreement advances a rights-based approach to stakeholder engagement in the monitoring and compliance processes, which is elaborated upon in further detail below.

Unsurprisingly, the BBNJ negotiations described in chapter 8 have identified many of the aforementioned general principles and approaches in the recommendation of PrepCom concerning a new Implementation Agreement under UNCLOS. All of these ought to be incorporated into the CRD Agreement. Ultimately, the codification and effective application of principles and approaches on foot of a new regional agreement

[50] See Chapter 2.
[51] Chapters 6 and 7.
[52] Chapter 6 OSPAR case study.
[53] Chapter 7 CCAMLR case study.
[54] Chapter 6 OSPAR case study.
[55] Chapter 7 CCAMLR case study.
[56] M. Peña (2015) *The Principle of No Regression of Environmental Law in Ibero-America*. Costa Rica: IUCN.
[57] Chapter 8.

will help minimise the adverse impacts of anthropogenic impacts on ecosystem services, structure and functions of the unique biodiversity associated with the CRD. In light of its dynamic spatial distribution, the issue of compatibility between management measures in ABNJ and within national jurisdiction is addressed separately below under the *chapeau* of adjacency. As will be seen, this clearly raises vital law and policy considerations for Costa Rica and neighbouring States.

9.3.4 Adjacency

As stated in the hypothesis of this thesis, States have customary and treaty obligations to protect the marine environment. This is one of the cornerstones in the development of the concept of adjacency in the BBNJ negotiations, as it aims to achieve the protection of the marine environment and its associated biodiversity both within and beyond national jurisdiction. A similar issue has arisen in Ireland in the context of protecting deep-water coral and sedentary species on the outer continental shelf.[58] The topic is contentious and of concern to the international community in the broader context of the 77 submissions made to the Commission on the Limits of the Continental Shelf under Article 76 of UNCLOS.

Essentially, there appears to be three strands to the rationale underpinning the concept of adjacency. First, it acknowledges that many marine ecosystems such as the CRD straddle various maritime jurisdictional zones established under the law of the sea. For this reason, as evidenced in the regional case studies, many regional organisations are implementing the ecosystem-based approach to address transnational regulatory and governance matters.[59] Secondly, in the latter context, the multidimensional scientific and regulatory characteristics of the ocean must be taken into account in designing new legal arrangements for ABNJ. In particular, the ecological connectivity that is reflected in the concept of adjacency can be acknowledged in the new Agreement in two ways: a) horizontally, considering the interconnection of the EEZ and ABNJ, and b) vertically in the water column, in the cases where high seas areas are superjacent to the extended continental shelf of a particular coastal State.[60]

[58] R. Long, A. Grehan (2002) 'Marine habitat protection in sea areas under the jurisdiction of a coastal member state of the European Union: the case of deep-water coral conservation in Ireland,' *The International Journal of Marine and Coastal Law*, Vol. 17(2), 235-261.
[59] Dunn, above n 20, 6.
[60] UNCLOS. Article 76(4)–(6).

Thirdly, the concept is particularly thought-provoking in the designation of MPAs that are adjacent to or adjoining areas under national jurisdiction, as this conundrum presents many legal and practical challenges. As noted by Professor Oude Elferink, there are three unresolved issues that need to be addressed by the BBNJ Implementation Agreement, and by inference the CRD Agreement: (1) How should the ILBI guarantee that the establishment of an MPA will have due regard for the rights of coastal States established under UNCLOS?; (2) What role should coastal States play in the establishment of MPAs adjacent to or adjoining areas under the jurisdiction of those States?; (3) How should the ILBI address the need for/desirability of compatibility, complementarity and integration of measures across different jurisdictions?.[61]

In the realm of straddling and highly migratory fisheries, many of the legal issues are resolved by the principle of compatibility under the UNFSA.[62] Instructively, the learned Professor argues that it seems reasonable to adopt due regard as a general standard in line with various provisions governing coastal State interactions with other States under UNCLOS.[63] Moreover, although the substantive content of due regard is not elaborated upon in UNCLOS it is further fleshed-out in several maritime delimitation cases, including: *Bangladesh v. Myanmar*, which held that "there are many ways in which the Parties may ensure the discharge of their obligations in this respect, including the conclusion of specific agreements or the establishment of appropriate cooperative arrangements. It is for the Parties to determine the measures that they consider appropriate for this purpose." [64] Subsequently, this approach was confirmed in *Bangladesh v. India*, where the Tribunal held that it "is confident that the Parties will act, *both jointly and individually*, to ensure that each is able to exercise its rights and

[61] A. Oude Elferink, 'MPAs adjacent to or adjoining areas under national jurisdiction: Legal and practical challenges.' Unpublished paper presented at the *Workshop on an ILBI on ABNJ, Government of Portugal and the High Seas Alliance*. Lisbon, 2-3 March 2017.
[62] UNFSA. Article 7.
[63] UNCLOS: a) EEZ: mutual due regard in exercising rights and performing duties under the Convention (articles 56, 58); b) continental shelf within and beyond 200 nautical miles: exercise of rights by coastal State must not infringe or result in any unjustifiable interference with rights and freedoms of other States as provided for in the LOSC (article 78); c) high seas: exercise freedoms with due regard for the interest of other States in the exercise of these freedoms; in case of freedom of fishing additionally reference to rights and duties and interests of coastal State (article 116); d) the Area (mining): due regard to rights and interests of coastal State in relation to deposits that straddle the Area and ABNJ (article 137, 142).
[64] *Dispute concerning delimitation of the maritime boundary between Bangladesh and Myanmar in the Bay of Bengal (Bangladesh/Myanmar)*. ITLOS Case No. 16. Judgment of 14 March 2012. Para. 476.

perform its duties within this area (emphasis provided).[65] In the *Chagos Arbitration Award*, the Arbitral Tribunal took a more nuanced approach and stated that "due regard" means the UK having "such regard for the rights of Mauritius as is called for by the circumstances and by the nature of those rights."[66] Significantly, it declined to find that the due regard provisions in UNCLOS resulted in the formulation of "any universal rule of conduct."[67] Accordingly, it held that "the Convention does not impose a uniform obligation to avoid any impairment of Mauritius' rights; nor does it uniformly permit the United Kingdom to proceed as it wishes, merely noting such rights."[68]

With this in mind, the CRD Agreement should not undermine UNCLOS. This could be avoided by the introduction of a provision such as "States shall exercise their rights and perform their obligations under the Agreement with due regard for the rights and obligations of other States under UNCLOS and this Agreement." Moreover, the concept of adjacency could operationalize the duty to cooperate as incorporated as a legal principle in the Agreement. In line with this construct, coastal States from Central America would be required to effectively cooperate, ensuring the compliance of conservation and management measures in the ABNJ of the CRD. They would also be required to harmonize their national legislation with the view to address the conservation of the CRD and its migratory species in a comprehensive manner. One of the possible outcomes of this approach is that States Parties to the CRD Agreement would have "greater influence over the management of those ABNJ resources which are in adjacent sea areas."[69] This is of vital national importance to a number of Latin American States and the SIDS. It is also of direct relevance to this study. As indicated in chapter 2, Costa Rica may have an extended continental shelf in a part of the Pacific Ocean adjacent to the CRD.[70] In the specific case of establishing a MPA in such area, the adjacency provision will play a significant role, as the enhanced influence of this coastal State should prioritize the adoption of provisions to ensure the sustainable management and conservation of the associated marine biodiversity of the CRD. On

[65] Bay of Bengal Maritime Boundary Arbitration between Bangladesh and India. Award of 7 July 2014, para. 476. Available at: https://www.pcacases.com/web/sendAttach/383
[66] See n 48. Chagos Arbitration Award of 18 March 2015, para. 519.
[67] Ibid.
[68] Ibid.
[69] Dunn, above 20, 1.
[70] See Preliminary information indicative of the outer limits of the continental shelf beyond 200 nautical miles submitted by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/cri2009informacion_preliminar.pdf

this basis, it appears the concept of adjacency will be case-specific and may require consultation with the coastal State. Clearly, it will entail establishing a mechanism that allows Parties to the CRD Agreement "to assess how rights and obligations may be balanced with those of the coastal State."[71] In such instances, there may be a requirement to consider alternative approaches and for proportionate burden sharing to help the needs of developing States such as Costa Rica.[72]

9.3.5 Protection of vulnerable species

The CRD has outstanding characteristics as a high productivity area that supports unique marine biodiversity, including marine mammals, seabirds and marine predators, several of which are classified as endangered and vulnerable species under the Annexes of CMS and CITES, as seen in chapters 2 and 3 of this study.

Different activities and uses impact fragile migratory species such as cetaceans and leatherback turtles and therefore require specific provisions for their protection. In this regard, such regulations could oblige Contracting Parties to consider the potential and cumulative effects of anthropogenic activities conducted within its jurisdiction on the status of vulnerable species in the CRD, and subsequently to replace harmful practices with best practice actions. Moreover, these provisions could call upon States to develop and implement measures to prevent or mitigate the adverse effects of human activities that may negatively impact the overall conservation status of the CRD.

Additionally, as all Central American countries are Parties to that Convention, good State practice like the effective enforcement of CITES provisions could be reinforced within the CRD Agreement. More specifically, the development of measures regarding the introduction from the sea, concerning the transportation into a State of specimens taken in ABNJ, could be addressed with coordination measures and enhanced cooperation between Contracting Parties, IATTC and OSPESCA, as the relevant fisheries organisations in the Central American region described in chapter 5.[73]

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[71] Oude Elferink, above n 61.
[72] Ibid.
[73] Within this framework, if a vessel on the high seas takes specimens listed on CITES Appendices and delivers them to the same country in which it is flagged, this operation will need an introduction from the sea certificate, given that there is only one State involved. However, if more than one State is involved, and, for example, a vessel delivers the specimens

In advancing the implementation of global provisions in a regional framework, the CRD Agreement could also address and enhance management and conservation measures from the Appendices in the Convention of Migratory Species. This presents a number of difficulties in the Central American region as only Costa Rica and Honduras are Parties to this Convention. However, some tools from CMS could be boosted within the CRD Agreement, such as the coordination with Range States on listed species in ABNJ, the promotion of trans-boundary area-based conservation measures, including ecological networks of MPAs, among others. As seen previously, a similar constructive approach has been adopted under the Sargasso Sea in relation to the migration of European eel, as evidenced by the progress undertaken at the Galway CMS workshop.[74]

Another frequently utilized tool in the protection of vulnerable species is their identification and further inclusion in lists of threatened or declining species and habitats,[75] as done in the Annexes of CITES or CMS, OSPAR and the Madrid Protocol within the Antarctic Treaty system.[76] Likewise, and as seen in chapter 6, cooperative measures for the protection and conservation of endangered or threatened species,[77] and the prohibition of the destruction or damage to the habitat of those species[78] could be replicated in the CRD Agreement. Coordination priorities with the CCAD could also be established since one of its current responsibilities is to develop updated lists of protected areas, threatened species and habitats.[79]

In considering a wider regional scope, the Inter-American Sea Turtle Convention is applicable to vessels[80] in the high seas areas of the CRD, and some of its conservation measures concerning sea turtles could reinforce further provisions in a new CRD

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to another country, CITES Parties will treat this transaction as an export and it requires the issuance of an export permit by the country to which the harvesting vessel is flagged.

[74] Chapter 3.

[75] OSPAR Commission. Agreement 2008/6. List of threatened and/or declining species and habitats.

[76] Madrid Protocol. Annex II. Article 4.

[77] SPA/BD Protocol. Article 12.1

[78] Ibid. Article 12.3

[79] Convention for the Conservation of the Biodiversity and the Protection of Wilderness Areas in Central America. Article 36.

[80] Inter-American Convention for the Protection and Conservation of Sea Turtles. Article IV (1.b)

Agreement.[81] Likewise, in relation to specific shark populations, the CRD Agreement could include provisions for substantial coordination and cooperation between Contracting Parties and the IATTC to further improve and implement management and prohibition provisions developed under this RFMO.[82] Additionally, and taking in consideration the personal scope of the new CRD Agreement, if 'market States' are included in the Agreement, there could be conservation measures addressing market tools and instruments such as management guidelines developed by OSPESCA for particular species, namely: sharks, lobsters, and other pelagic species.[83] These provisions could be advantageous within the new scheme established by the CRD Agreement, with the view to prevent the trade of fish and marine products caught using prohibited methods or fishing gears, or captured in closed areas, among others.[84]

9.3.6 Protection of the CRD marine ecosystem

The new CRD Agreement must urge Contracting Parties to protect, conserve and, where feasible restore the CRD ecosystem, due to its uniqueness and critical significance for multiple species as a breeding, feeding and migration area. Therefore, the CRD Agreement could provide a legal basis for the establishment of a comprehensive and integral network of ABMTs with specific targeted conservation measures including those that arise under the CBD, as all Central American countries are Parties to the latter.

In relation to shipping, which is a major activity that impinges upon the CRD, the Agreement could also enhance coordination actions with the IMO to ensure that conservation measures developed by this international body are applied effectively in the Central American region. For example, the establishment of the CRD as a Special Area[85] within the framework of MARPOL,[86] would build up a stronger regional

[81] For example, the prohibition of the capture or killing of sea turtles, or its domestic trade; compliance with CITES obligations; conservation and restoration of sea turtle habitats and nesting areas, the designation of protected areas; among others.
[82] Some examples are: the prohibition of trans-shipping, landing or trading fins harvested in contravention of IATTC Resolutions, reporting of data for catches, landing and trade of sharks by species, observers programs, and other measures outlined in chapter 5.
[83] OSPESCA. Harmonized fisheries management measures. (on line) Available at: http://www.sica.int/busqueda/secciones.aspx?IdItem=11297&IdCat=48&IdEnt=47
[84] OSPESCA. Integration Policy for Fisheries and Aquaculture. Strategic action line. VI.7.9, 35.
[85] D. Freestone; O. Varmer; M. Bennett; A. Wilhelm; Th. Beuttler; J. Ardron; S. Maxwell; K. Killerlain Morrison (2014) 'Place-based Dynamic Management of Large Scale Ocean Places:

backdrop to prevent pollution, as different measures, seen in chapter 4, are triggered once an area has been designated as such. Additionally, in the prevention of sea pollution by oil,[87] two technical Annexes from MARPOL, which have been outlined in the Sargasso Sea case study, could be applied in the CRD as well, namely: Annex I) Regulations for the prevention of pollution by oil and Annex V) Prevention of pollution by garbage from ships. More specifically on plastic pollution, MARPOL provisions could be used to address vessel source pollution. Furthermore, supplementary measures to prevent marine pollution could be taken into account and reinforced by specific provisions in the CRD Agreement, for example improved cooperation on the high seas[88] in the implementation of the London Protocol,[89] and the Convention and Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other than Oil.[90] Moreover, in regards to potential proposals of geo-engineering and ocean fertilization activities in the CRD, the consideration of the rules contained in IMO Resolution L.P4(8) and CBD Decision XI/20 on climate-related geo-engineering,[91] are relevant to preventing significant adverse trans-boundary effects.[92]

Addressing human activities in ABNJ and foreseeing potential impacts of activities and uses of the marine environment and its associated biodiversity in the CRD is critical to the success of the proposed regime. Therefore, consideration ought to be given to the establishment of criteria to identify the extent and nature of human activities and their impacts on the marine ecosystem,[93] with the view to informing decision-making processes and to providing better advice management and conservation measures in the Dome, similar to the scheme described in the OSPAR case study. Once the different

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Papahānaumokuākea and the Sargasso Sea,' *Stanford Environmental Law Journal*. Vol. 33(2), 227.

[86] The Convention for the Prevention of Pollution from Ships 1340 UNTS 184. Adopted 2 November 1973.

[87] Ibid. Annex I Regulations for the Prevention of Pollution by Oil. Article 1, 10.

[88] London Convention. Article VII (3).

[89] Ibid. Article VII.

[90] Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil. UNTS 1313. Entered into force 30 March 1983.

[91] Convention on Biological Diversity. Decision XI/20. Climate-related geoengineering. Eleventh meeting, Hyderabad, India, 8-19 October 2012 (on line): https://www.cbd.int/doc/decisions/cop-11/cop-11-dec-20-en.pdf

[92] Resolution LP .4(8) was adopted on 18 October 2013.

[93] OSPAR Convention. Annex V. Appendix 3. Guidelines could include: a) the extent, intensity and duration of the human activity under consideration; b) actual and potential adverse effects of the human activity on specific species, communities, and habitats; c) actual and potential adverse effects of the human activity on specific ecological processes; d) irreversibility or durability of these effects.

conservation measures are established, a practical tool to advance their implementation and compliance is the publication of an annual schedule of conservation measures in force,[94] as undertaken by CCAMLR.[95]

9.3.6.1 Area-based management tools

Gathering relevant features from the multilateral instruments analysed in chapters 3 and 4, and from the case studies addressed in chapters 6 and 7, the CRD Agreement ought to display a number of substantive provisions addressing area-based management tools. As seen, multilateral instruments and United Nations bodies have developed a variety of area-based management tools to protect site-specific areas and associated species and habitats. The sectoral approach of these tools can be overcome by the adoption of an overarching and cross-sectoral coordination and cooperation mechanism. One way forward to address such an approach would be the establishment of a collective arrangement, following the practice of OSPAR, as a means to provide a comprehensive basis of cooperation and coordination between competent international organisations on the different activities taking place in selected sites in ABNJ in the CRD which are subject to specific schemes of management. [96]

As a departure point, the CRD Agreement could categorise the Dome as an area of exceptional international importance, and thus deserving urgent protection. In this regard, *in situ* conservation tools could be used to protect vulnerable species in their habitat(s). Contracting Parties will be obliged to take the necessary implementation and compliance measures in respect of their nationals and vessels flying their flag.[97] The CRD Agreement would complement existing conservation provisions and enforcement actions to ensure their effectiveness.[98] However, only Parties to the CRD Agreement would be bounded by such obligations, which obviously is a systemic weakness in marine environmental law more generally as it applies to ABNJ.

[94] CCAMLR Convention. Article 9(3),(6).
[95] Chapter 7.
[96] OSPAR Commission, above n 36.
[97] UNFSA. Article 7(2), 18, 19.
[98] CBD. Article 8(e).

9.3.6.2 Establishment of EBSAs & MPAs

As seen in chapter 3 of this study, the CBD advances a spatial management approach to marine environmental protection, providing a legal basis for the designation of Ecologically or Biologically Significant Marine Areas (EBSAs). The science-driven EBSA process[99] could lead to the establishment of ABMTs, including MPAs, to improve and consolidate conservation actions in the CRD, and at the same time, contribute to the achievement of global targets such as the Aichi Targets and SDG 14.

As seen previously, an area of the CRD has been included as part of the Papagayo upwelling system and adjacent areas EBSA, which was designated under CBD in 2014.[100] This EBSA could be further complemented by sectoral measures pursuant to specific regulatory schemes in the CRD on fisheries, navigation, seabed mining, or even entail the establishment of a discrete MPA for this purpose. Indeed, a scheme for the creation of MPAs in the ABNJ of the CRD could be codified in the new Agreement, following a similar management approach to the one adopted under the Antarctic Treaty analysed in chapter 7. Given that the different countries in the Central American region have diverse management categories within their own protected areas systems, and with the view to provide flexibility for the different users of the resources in the Dome, two MPA approaches appear most suitable.

The first option would be the use of a *Specially Protected Area,* with the objective of protecting areas that are considered examples of outstanding environmental, scientific, or wilderness values.[101] The CRD Agreement could comprise the criteria to guide the establishment of these areas. For example, the CCAMLR and OSPAR Convention provide for designation on the basis of a site's importance due to unusual assemblages of species and outstanding wilderness value,[102] or due to the high natural biological diversity and large-scale ecosystem processes responsible for productivity and functional integrity. Access to these areas should be prohibited unless Parties have

[99] Freestone, Varmer, Bennett, Wilhelm, Beuttler, Ardron, Maxwell, Morrison, above n 85, 244.
[100] UNEP/CBD/COP/DEC/XII/22.
[101] Madrid Protocol. Annex V. Article 3.
[102] Ibid. Annex V. Article 3 (2).

specific permits. Additional elements could be taken into account from other regional case studies explored in chapters 6 and 7.[103]

The second category of MPA that could be established in the ABNJ of the CRD is a *Specially Managed Area*, where activities pose risks to the marine environment or to curtail cumulative environmental impacts on specific sites.[104] The main difference with the previous MPA category is the possibility to enter these areas without a permit.[105] For both categories of MPAs, Contracting Parties to the CRD Agreement should appoint an authority to issue permits to enter and engage in activities in accordance with the management scheme and institutional arrangements set down for such areas.[106] Thereafter, the process to establish MPAs in the ABNJ of the CRD would be incorporated in the new Agreement, and pertinent procedural elements from the case studies analysed in chapter 6 could also be included in the new instrument. Additionally, consideration must be given to the establishment of MPAs in ABNJ or in high seas areas over the extended continental shelf of coastal States, bearing in mind that Costa Rica may have an extended continental shelf in a part of the Pacific Ocean adjacent to the CRD.[107] This topic was examined above in the context of the discussion of adjacency.

The development of a representative and comprehensive network of MPAs[108] should be a mid- and long-term objective within the CRD Agreement, requiring good representation of the different biogeographic regions within the Eastern Tropical Pacific and the CRD.[109] In regards to management actions and similar to the OSPAR framework, supplementary recommendations[110] and accountability measures to guide

[103] For example, the establishment of such MPAs should be the outcome of a process led by the best available scientific evidence and informed by an ecosystem approach; the MPA must detail objectives; spatial boundaries; restricted, prohibited, or managed activities, temporal or spatial limits on activities; priority elements for a management plan, research and monitoring plans. CCAMLR. Conservation Measure 91-04 (2011). Para. 3, 5.
[104] Madrid Protocol. Annex V. Article 4.
[105] Ibid. Annex V.
[106] Ibid. Annex V. Article 7.
[107] See n 70.
[108] L. Douglass, D. Beaver, J. Turner, R. Nicoll (2016) *An identification of areas within the high seas of the Southern Ocean that would contribute to a representative system of MPAs*. Australia: CCAMLR. (WS-MPA-11/16).
[109] OSPAR Commission (2014) *Status Report on the OSPAR network of marine protected areas*. London: OSPAR, 41.
[110] OSPAR Commission. Agreement 2003/18. Guidelines for the management of MPAs in the OSPAR maritime area, Appendix I.

Contracting Parties must be developed within the CDR scheme. In this regard, a bifurcated approach to management measures taken by OSPAR could be replicated in the CRD scheme, namely: a) the Contracting Party is competent to adopt a measure and should initiate the processes under its domestic legislation, b) where the competence lies with another authority or international organisation, the State should seek the adoption of those measures by the international organisation.[111] Also, following the approach adopted under the Barcelona Convention, a List of Specially Protected Areas could be a useful tool for collaboration and coordination among Contracting Parties in the CRD framework. Once an MPA is included on the List, the Contracting Parties to the CRD Agreement must respect the conservation measures adopted for the specific MPA.[112] This list could then be usefully cross-referenced with the current list of protected areas from the Central American region developed by the CCAD.[113]

Another option that could be considered is the establishment of a whale sanctuary in the CRD under the International Convention for the Regulation of Whaling provisions, as previously analysed in chapter 3. Likewise, consideration ought to be given to the future designation of the CRD as a UNESCO World Heritage Site in ABNJ, and the subsequent application of this distinctive legal regime to the Dome, similar to the approach advocated by Professor Freestone in relation to the Sargasso Sea, as outlined in chapter 7.

9.3.6.3 Establishment of VMEs in the CRD

As previously outlined in chapter 4, the FAO has developed multiple instruments and management tools that are applicable to fisheries in the high seas. In relation to ABMTs, the vulnerable marine ecosystem concept emerged and gained momentum after UNGA Resolution 61/105.[114] As seen previously, this ABMT has been further developed through the FAO Guidelines for the management of deep-sea fisheries in the high seas.

[111] OSPAR Commission. Recommendation 2003/3 amended by Recommendation 2010/2. Para. 3.2.
[112] Protocol concerning Specially protected areas and biological diversity in the Mediterranean. Article 9.5.
[113] As seen in Chapter 5, the CCAD has a mandate to develop a list of protected areas under article 36 of the Convention for the Conservation of Biodiversity and Protection of Priority Wildlife Areas in Central America.
[114] UNGA Resolution 61/106, 8 December 2006.

Accordingly, the CRD Agreement could set up provisions to promote the establishment of VMEs in the Dome's ABNJ. In such instances, once a VME is identified, it would trigger specific mandatory management measures by the Contracting Parties to the CRD Agreement, which must be taken to ensure that the ecosystem's integrity is not compromised.[115] For the reasons outlined in chapter 4, the IATTC would be the competent organisation to adopt and implement, with the support of member States, the conservation measures in such areas.[116]

9.3.6.4 Establishment of PSSA

The vicinity of the Panama Canal to the CRD represents serious threats and pressures for its marine environment and biodiversity from intensive commercial shipping operations and navigation. This is one of the world's great trade routes and to prevent or reduce risks from the shipping industry, and to minimize the interaction of heavy traffic with vulnerable species and habitats that benefit from the CRD, several management actions could be adopted including: a) marine spatial planning schemes, b) the establishment of regulations on navigation speeds, c) the establishment of noise-free areas, and d) the designation of a Particularly Sensitive Sea Area. As highlighted previously in chapter 4, the latter is an ABMT developed by the IMO, applicable to areas with recognized ecological, socio-economic or scientific attributes, in need for special protection through IMO actions due to the potential threats that are posed by international shipping.[117] The submission for a PSSA designation by any Contracting Party to the CRD Agreement should meet the criteria and procedural steps established by IMO. Likewise, there is a possibility to submit a coordinated PSSA proposal from two or more States with a common interest in a particular area. Contracting Parties to the CRD Agreement must ensure that ships flying their flag comply with the associated protective measures.[118] In addition, as indicated in chapter 5, COCATRAM is the

[115] FAO Deepsea Fisheries Guidelines, 22.
[116] The IATTC Antigua Convention contains different provisions on conservation and sustainable use of fish stocks, for example Articles I, IV, V, VII (1.c,d,f), XVIII (1), XX (1). These provisions will be addressed in further detail in Chapter 4.
[117] IMO Assembly Resolution A.982 (24). *Revised guidelines for the identification and designation of Particularly Sensitive Sea Areas*. 1 December 2005. 3.
[118] Ibid. Some examples of protective measures are: Designation of an area as a Special Area under MARPOL Annexes I, II or V, or a SOx emission control area under MARPOL Annex VI; Application of special discharge restrictions to vessels operating in the PSSA; Adoption of ships' routing and reporting systems near or in the area, under the International Convention for the

regional focal point to address maritime navigation and the appropriate institutional actor to coordinate measures for the possible designation of a PSSA in the CRD. They could work with the IMO in formulating tailored provisions to address shipping, the completion of consultation processes with affected States and stakeholders, and to ensure the domestic implementation of any IMO adopted measures.[119]

9.3.6.5 Establishment of APEIs in the CRD

As the outset, it must be highlighted that the establishment of a seabed mining moratorium in the CRD should be considered as the only sensible precautionary option,[120] mainly because of the catastrophic impacts that this activity has on biodiversity and marine habitats.[121] As noted in recent literature, "full-scale commercial extraction of deep-sea minerals must be delayed" by the ISA until deep seabed mining impacts are "scientifically scrutinized and deliberated."[122] Pointedly, as seen in chapter 3, the ISA framework has developed recommendations on areas of particular environmental interest (APEIs), another type of ABMT applicable on the seabed area in ABNJ. In this regard, designating of the CRD's total area as an APEI would ensure the adoption and implementation of a comprehensive environmental management plan to protect the marine environment of the Dome from harmful effects that may arise from exploration and exploitation activities in the Area. Consequently, the main result from the establishment of an APEI in the CRD is that no application for approval of a plan of work for exploration or exploitation should be granted by the ISA.[123]

Safety of Life at Sea (SOLAS); PSSA may be designated as an area to be avoided or it may be protected by other ships' routing or reporting systems.

[119] International Hydrographic Organisation. Committees of the Mesoamerican and Caribbean Sea Hydrographic Commission. B) Considering Alternatives for Managing Ship Traffic. Available at: http://www.iho-machc.org/documents/ecctg1_doc.html#A

[120] Notably the ISA has power under UNCLOS to disapprove areas of exploitation in cases where substantial evidence indicates the risk of serious harm of the marine environment. UNCLOS Article 162(2)(x). See also: M. Lodge (2001) 'Some legal and policy considerations relating to the establishment of a representative network of protected areas in the Clarion-Clipperton Zone,' *Int. J. Mar. Coast. Law*, Vol. 26, 463–480.

[121] C. L. van Dover, et. al. (2017) 'Biodiversity loss from deep-sea mining,' *Nature Geoscience*, Vol. 10, 464.

[122] K. Rakhyun (2017) 'Should deep seabed mining be allowed?,' *Marine Policy*, Vol. 82, 136. See also: A. L. Jaeckel, *The International Seabed Authority and the Precautionary Principle* (Boston: Brill Nijhoff, 2017.

[123] ISA. Decision of the Council relating to an environmental management plan for the Clarion-Clipperton Zone ISBA/18/C/22. Para 6.

9.3.7 Institutional arrangements

As noted by Ringbom and Henriksen, "in the absence of an overarching governance framework for ABNJ, the prevailing freedom-oriented, sector-based approach to the conservation and environmental protection of ABNJ is likely to continue, with different rules and principles governing different uses."[124] Moreover, the lack of a regional body to comprehensively coordinate conservation measures in the ABNJ of Central America is one of the principal reasons why it is necessary to establish a holistic institutional framework for the protection of the marine environment in the CRD. Therefore, a new robust legal framework for the ABNJ of the CRD needs an institutional backbone to guarantee its success. Acknowledging the various structures and institutional arrangements examined in CCAMLR, OSPAR, Barcelona Convention, Sargasso Sea and CPPS case studies, the following paragraphs will recommend a potential institutional architecture for the CRD.

As a departure point, it must be highlighted that currently there isn't a comprehensive and integral management authority, neither advisory nor consultation mandates for the conservation of the marine environment in the ABNJ of the CRD, as is evident from the discussions in chapters 3, 4 and 5. Therefore, addressing the hypothesis stated in chapter 1, there is an urgent need to establish a cross-sectoral institutional framework for the ABNJ of the CRD. Specifically, the new Agreement will provide the legal basis for the creation of a decision-making body, in the form of a Meeting of Signatories, comprised of the representatives of each of the Contracting Parties. To secure the highest political level in decision-making processes, the representative of each State could, for instance, be the Minister of Environment/Marine or Natural Resources. This body will provide advice and guidance to the CRD Commission and promote multi-sector assessments and decisions;[125] review and comment on the Commission's work programme and action plans proposals; pursue collaboration and cooperation with other regional and international organisations; among other functions.[126]

The new Agreement could also provide a legal basis for the establishment of the CRD Commission, as a stand-alone legal entity, following the Sargasso Sea Commission

[124] Ringbom, Henriksen, above n 10, 85.
[125] Ibid. 28.
[126] Hamilton Declaration. Para. 5

example explored in chapter 7. The Commission will be formed by representatives from the Contracting Parties, and discharge core responsibilities in the implementation of the decisions taken by Meeting of Signatories. The CRD Commission will work towards the harmonisation of policies, programs and measures, with the view to improving the conservation of the marine environment and its associated biodiversity within and beyond national jurisdiction in the CRD.[127]Also, it would be required to meet at regular intervals, and at any time to respond to special circumstances. In a similar approach to OSPAR, the CRD Commission could have the possibility to regionalize particular provisions, pursuant to which it may decide that an adopted provision will apply to all the geographical area of the CRD Agreement (that is to say is of general application), or just to a specific marine area.[128] More specifically, deriving examples of best management and regulatory practice from OSPAR, IATTC and CPPS, the Commission could be tasked with the following: creating a network of MPAs in ABNJ; [129] applying the precautionary approach; [130] adopting conservation and management measures for specific species; [131] addressing cumulative effects of multiple impacts in the CRD;[132] establishing compliance mechanisms including supervision and reporting systems, [133] promoting and coordinating scientific research; [134] adopting standards for collection and reporting of data;[135] promoting comprehensive assessments of biodiversity and marine resources; [136] as well as promoting the consolidation of regional regulations. [137] Furthermore, building on the CCAMLR experience, the adoption and revision of conservation measures must be done by the CRD Commission on the basis of the best available scientific information.[138] Such conservation and management measures adopted would be binding on Member States after the statutory notification period. [139] In promoting and achieving effective cooperation and coordination, the Commission could engage with neighbouring countries in

[127] CPPS Statutes. Article 3(a).
[128] OSPAR Convention. Article 24.
[129] OSPAR Commission, above n 109, 7.
[130] IATTC Antigua Convention. Article 7(m).
[131] Ibid. Article 7(f).
[132] Ringbom, Henriksen, above n 10, 91.
[133]Reporting systems provide the foundation for international supervision. Y. Tanaka (2009) 'Reflections on reporting systems in treaties concerning the protection of the marine environment,' *Ocean Development and International Law*, Vol. 40, 146.
[134] IATTC Antigua Convention. Article 7(a).
[135] Ibid. Article 7(b).
[136] CPPS Statutes. Article 3(i).
[137] Ibid. Article 3(c).
[138] CCAMLR. Article 9.
[139] Ibid. Article 9(6).

comprehensive actions to protect shared marine environments and resources. In addressing effective cross-sectoral coordination, the Commission could also establish MoUs or Agreements with regional fisheries organisations,[140] as well as with other relevant bodies such as IMO, FAO, ISA, IATTC, the SICA agencies (CCAD, OSPESCA, COCATRAM), and the Regional Seas Programme of the North-East Pacific Secretariat, among others.

A third component of the institutional arrangement for the CRD framework would be the establishment of subsidiary bodies, namely, a Scientific Committee, a Compliance Committee and the Coordination Units. Each of these merits separate consideration.

The Scientific Committee would provide scientific and technical advice to the CRD Commission. This consultative and multidisciplinary body [141] would have the participation of all the Contracting Parties, comprising Government representatives competent in the relevant fields of expertise, academia and other relevant organisations such as NGOs. This Committee will report regularly to the CRD Commission on all aspects of its work.[142] Considering other functions tasked to the scientific committee in CCAMLR, the CRD Scientific Committee could establish criteria and methods underpinning conservation and management measures; assess the status of marine environment and its biodiversity; and present reports and recommendations to the CRD Commission to further fulfil the objectives of the CRD Agreement.[143]

Vital and central to the hypothesis in chapter 1, the CRD Agreement could provide a legal basis for the establishment of a Regional CRD Compliance Committee. This Committee would promote the implementation of the new Agreement and review its compliance, following up on States in regard to their obligations. The new instrument could clarify the composition of the Committee, establish trigger mechanisms and specify voting rules. For example, such Committee could be formed of representatives from States Parties and observers. The latter could include the representatives of NGOs and other observers with power to trigger the compliance mechanisms, along the lines

[140] OSPAR Commission (2010) *Quality Status Report 2010*. London: OSPAR. Chapter on the use of living marine resources.
[141] CCAMLR. Article 14.
[142] O. Spijkers; A. Oude Elferink (2016) 'Potential for a new CMS Agreement on the European eel,' *First Range State Workshop on the European Eel*. Galway, Ireland: UNEP/CMS. Also see Chapter 3 of this thesis.
[143] CCAMLR. Article 15(2).

adopted in a number of RFMOs. Following the Barcelona Convention experience, the Committee could adopt decisions in relation States Parties in persistent non-compliance, as well as recommend measures to facilitate implementation and compliance, such as reporting, and development of a compliance action plan, among others.[144]

Also derived from the Barcelona Convention scheme, the putative Agreement for the CRD could establish coordination units or focal points tasked to ensure the effective implementation of the conservation measures under the new regional instrument. These focal points could potentially be matched with existing regional structures in Central America, for example, the ones already in place in the CCAD as outlined in chapter 5.

Another type of ad-hoc subsidiary bodies, drawing from the CPPS and OSPAR case studies, will be the establishment of working groups[145] to examine specific ABNJ topics. Moreover, taking into account the negotiation process to develop a new BBNJ Agreement, the Central American countries could establish working groups addressing the specific elements of the package deal, examined in chapter 8 of this study, namely: ABMTs, EIAs, MGRs,[146] capacity building and technology transfer. The work done within such technical groups could enhance the implementation of the future provisions under the BBNJ Agreement, as well as achieve the overall goal of conservation of biodiversity in deep waters and ecosystems in ABNJ.[147] As pointed out in the CPPS case study in chapter 7, these groups of experts will promote science-based decision-making processes within the new CRD framework.

One of the most distinctive features advanced by the new regional treaty, with a view to ensuring transparency, legitimacy, accountability and an inclusive approach within the new framework, is that the Agreement will advance a rights-based approach to decision-making by providing a legal basis for observers[148] to participate in the CRD

[144] Barcelona Convention. Decision IG. 17/2; IG. 21/1; IG. 22/15.
[145] OSPAR Commission. Agreement 2013-02-Rules of Procedure, rules 27-35.
[146] CPPS. *Working Groups*. Available at: http://www.cpps-int.org/cpps-docs/gt/GT-B-RGM/TDR-GT-CPPS-B-RGM.pdf
[147] CPPS. *Working Groups*. Available at: http://www.cpps-int.org/cpps-docs/gt/GT-PSCB/2013/ago/informe-i-videoconf.pdf
[148] OSPAR Convention. Annex 2.

Commission discussions,[149] as well as in the work of the Scientific and Compliance Committees. It is pertinent that most of the case studies, reviewed in chapters 5-7, have such enabling provisions including the Barcelona Convention, OSPAR, the Antarctic Treaty and IATTC. The participation of observers from civil society organisations, international agencies and other relevant stakeholders will definitely enhance transparency and accountability processes in the Central American Region, as public participation is a fundamental legal principle in environmental management and informed decision-making.[150] Furthermore, the new CRD Agreement could provide principles and criteria for the participation of observers at meetings of the Commission,[151] and other Committees.[152]

9.3.8 Action Plan

The development of an Action Plan would specify tangible action lines within prescribed time frames, thereby materializing the rights and obligations of Contracting Parties pursuant to the CRD Agreement. It would be based upon decisions taken by the Ministerial level of the Parties, and enforcement at the national level will be assisted by national focal points, or coordination units, in a similar manner as under the Barcelona Convention. The Action Plan could be further developed in an Annex of the new instrument, with enough flexibility to be adaptable to emerging biogeographical conditions, changing scientific circumstances and anthropogenic challenges in the CRD. Considering the progress made under the OSPAR and the Barcelona Conventions, as well as the CPPS and the Sargasso Sea's Stewardship Plan, the CRD Action Plan could address the following elements: a) CRD biodiversity and ecosystem conservation and restoration; b) environmental impact assessment; c) seafloor and seabed; d) fisheries; e) shipping; f) research and scientific monitoring[153] including a knowledge node;[154] g) cross-sectoral coordination on issues such as marine spatial planning processes; along with h) education and awareness.[155] Additionally, the Action

[149] Ibid. Article 11.
[150] High Seas Alliance. Ten governance principles for an International legally binding instrument on marine biodiversity in areas beyond national jurisdiction. Working document. 2016.
[151] IATTC Antigua Convention. Annex 2.
[152] Antarctic Treaty. Article 14.
[153] OSPAR Commission (2010) *Strategy of the OSPAR Commission for the protection of the marine environment of the North-East Atlantic 2010-2020*. Available at: http://www.ospar.org/site/assets/files/1413/10-03e_nea_environment_strategy.pdf. Part II.
[154] CPPS Statutes. Article 5.
[155] Sargasso Sea Commission. Sargasso Sea Stewardship Plan – Executive Summary. 2017, 7-12.

Plan would form the basis of a comprehensive and long-term work programme for the CRD Commission; as well as strategies and activities to be implemented by Governments, relevant stakeholders and the CRD Commission,[156] such as continuous monitoring of ecological processes, habitats, biodiversity dynamics and the impacts of human activities[157] in the CRD. Finally, the Action Plan could complement existing regional instruments, outlined in chapter 5, such as the Regional Environmental Strategy 2015-2020 (CCAD),[158] the Central American Regional Maritime and Port Strategy (COCATRAM),[159] and the Integrated Fisheries and Aquaculture Policy (OSPESCA).

9.3.9 Marine Scientific Research (MSR)

Science is the very foundation of good decisions in ocean governance. Accordingly, there is an urgent need to close the scientific knowledge deficit, both in terms of basic research on the status and functioning of the biodiversity and other marine resources associated with the CRD's unique and dynamic ecosystem, as well as applied research including most notably research on marine genetic resources. In developing provisions on MSR in the CRD Agreement, account needs to be taken of the principles[160] and duties[161] set out in Parts XIII of UNCLOS. Following a similar approach to the Barcelona SPA/BD Protocol, Parties to the CRD Agreement must be obliged to encourage and develop scientific and technical research in relation to the management and sustainable use of biodiversity and protected areas in the Dome.[162] Likewise, the establishment of joint or cooperative research and monitoring programmes is crucial to the future operation of the CRD framework. Competent international organisations are called upon to promote and facilitate the development and conduct of MSR,[163] through

[156] Ibid. 5.
[157] SPA/BD Protocol. Article 7.2 (b).
[158] CCAD (2014) Regional Environmental Strategy 2015-2020 (on line). Available at: https://www.cbd.int/doc/meetings/mar/mcbem-2015-01/other/mcbem-2015-01-estrategia-regional-ccad-es.pdf
[159] COMITRAN. Resolution No. 01-2014. Entered into force on 11 November 2014.
[160] UNCLOS. Article 240, 241. MSR principles could include: a) MSR conducted exclusively for peaceful purposes, b) with appropriate scientific methods and means, c) not unjustifiably interfere with other legitimate uses of the sea, d) in compliance with regulations on protection and preservation of the marine environment, e) not constitute the legal basis for any claim to any part of the marine environment or its resources.
[161] Ibid. Article 248, 249, 244.
[162] Barcelona SPA/BD Protocol. Article 20.
[163] UNCLOS. Article 239.

bilateral and multilateral agreements in implementing their obligations under Part XIII of UNCLOS.[164] Therefore, an enabling mechanism that facilitates the participation of Central American scientists in collaborative MSR on vulnerable habitats and species in the CRD, and the impacts of particular human activities in the Dome, could be addressed in the new instrument. Similarly, the provisions in the new Agreement could also complement existing instruments like OSPESCA's Regional Research Plan.[165]

9.3.10 Building up capacities and technology transfer

Capacity building and the development and transfer of marine technology are key elements in UNCLOS.[166] Moreover, other multilateral instruments, like the 1995 Fish Stocks Agreement and the CBD, call for assistance between States and international organisations including cooperation with financial support, development of human resources and the transfer of technology.[167] However, and as seen in chapter 8, poor implementation of the relevant provisions in UNCLOS on capacity building poses significant challenges for developing States in Central America, particularly in deriving economic and environmental benefits from offshore resources.[168] Hence, the CRD Agreement should boost capacity building through various means including funding schemes, research and training programmes for scientists and other public servants, as well as by strengthening the judiciary and marine environmental law enforcement agencies of States.[169] Furthermore, with the view to building-up human, scientific, technological, organisational and institutional capabilities,[170] the CRD Agreement could replicate some schemes developed in other regional frameworks. For example, useful features outlined in chapters 5, 6 and 7 of this thesis, specifically from CCAMLR, CPPS, IATTC, Barcelona Convention and OSPAR, include: workshops and training programmes, scholarships to assist scientists from Member States,[171] strengthening the capacity of technical and scientific personnel of Member States;[172] and the creation of a

[164] Ibid. Article 243.
[165] Integration Policy for Fisheries and Aquaculture. Strategic action line VI.3.1, 23.
[166] UNCLOS. Parts XIII, XIV.
[167] UNFSA. Part VII.
[168] Y. Tanaka, *The International Law of the Sea,* 2 ed., (Cambridge: CUP, 2015), 370–375.
[169] Spijkers, Oude Elferink, above n 142.
[170] United Nations Development Programme (2008) Capacity Development Practice Note, 6. Available at: http://www.adaptationundp.org/sites/default/files/downloads/pn_capacity_development1.pdf
[171] CCAMLR. Resolution 31/XXVIII (2009). Para. 4
[172] CPPS Statutes. Article 3(l).

standardized system for collecting, processing and analysing data.[173] Furthermore, capacity building arrangements in the CRD Agreement ought to be demand-driven, ensuring national ownership and gender equality, multi-stakeholder partnerships,[174] country-owned and responsive to priorities related to ABNJ, with flexibility to adapt as needs and priorities change.[175]

Additionally, in accomplishing meaningful and tangible capacity building, cooperation for the development and transfer of marine technology needs to be addressed robustly in the new instrument.[176] Thus, technology transfer provisions developed under the CRD Agreement should be based upon the IOC-UNESCO Criteria and Guidelines,[177] and further supported by private and public actors and multi-stakeholder partnerships.[178] Likewise, the new instrument should aim to reinforce cooperation programmes in marine science and technology focused on the protection of the marine environment and biodiversity of the CRD[179] as well as access to and transfer of environmentally sound technology.[180] With a view to improving and maximizing synergies, these cooperative arrangements should be linked with a global clearing-house mechanism as envisaged in the BBNJ negotiation at the United Nations.[181]

9.3.11 Compliance, enforcement and stakeholders' engagement

The life of the law is effective enforcement and compliance. To paraphrase Roscoe Pound, the problem of how to enforce the law is closely aligned with how we style the

[173] IATTC. Resolution C-14-03. 2014. (on line) Available at: http://www.iattc.org/PDFFiles2/Resolutions/C-14-03-Special-fund.pdf
[174] Ibid.
[175] IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (116), 1.
[176] Technology transfer includes: a) physical infrastructure, b) access to data and information, c) manuals, guides, standards and best practices IOC/INF-1338. IOC potential contribution to a new international instrument under UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction. 1. See also: UNCLOS. Article 266.
[177] Ibid. See also: IOC Criteria and Guidelines on the Transfer of Marine Technology (CGTMT). Available at: http://unesdoc.unesco.org/images/ 0013/001391/139193m.pdf
[178] IISD (2016) 'PrepCom 1 highlights: Technology Transfer,' *Earth Negotiations Bulletin*. Vol.25(104), 1.
[179] UNCLOS. Article 144. See also 1994 Agreement on the Implementation of Part XI. Annex, Section 5.
[180] Barcelona Convention. Article 13.
[181] Chapter 8.

law.[182] In the context of the marine environment, enforcement and compliance ought to go hand-in-hand in the design and implementation of any regulatory scheme. Notably in this regard, Professor Oral points out that in the context of regionalisation, the subject matter of this thesis, "compliance mechanisms were developed precisely to seek a non-confrontational and facilitative approach to engender greater state compliance with legal obligations in international environmental agreements."[183] Accordingly, in achieving compliance within the CRD regional framework, Contracting Parties must cooperate in the effective implementation of the Agreement, as well as support reciprocal and cooperative enforcement and compliance arrangements for the exchange of information and follow-up actions.[184] Some examples of best practice were canvassed in this thesis, which could be replicated under the CRD Agreement, including the approach adopted by CCAMLR.[185] As seen in chapter 6, other regional frameworks, namely OSPAR and the Barcelona Convention, have also developed compliance mechanisms that could inform the development of such mechanism, including measures for monitoring, control,[186] surveillance and enforcement to ensure compliance with the conservation and management measures in respect of the ABNJ.[187]

Collective cooperation among Central American countries, either directly or through regional organisations, and international agencies is vital to achieve compliance and enforcement goals within the CRD framework. Likewise, the concept of adjacency plays an important role within an enforcement scheme, as the implementation of conservation measures that are compatible in areas under national jurisdiction and the adjacent high seas,[188] would ensure the integrity of the CRD and the long-term sustainability of its biodiversity. Moreover, the CRD Agreement could establish sanctions for non-compliance, reporting obligations regarding the progress on the implementation of conservation measures, and an active role for NGOs in overseeing, monitoring and ensuring compliance of provisions, in a similar manner to the CITES Convention scheme, of which all Central American countries are Contracting Parties.

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[182] R. Pound (1917) 'The Limits of Effective Legal Action,' *International Journal of Ethics*, Vol. 27(2), 150-167.
[183] N. Oral, *Regional cooperation and protection of the marine environment under international law: The Black Sea* (The Netherlands: Koninklijke Brill NV, 2013), 273.
[184] PSMA. Part IV.
[185] CCAMLR. Conservation Measure 10-08 (2009).
[186] IATTC. Resolution C-14-02. Also OSPESCA Integration Policy for Fisheries and Aquaculture. Strategic action lines VI.3.9, VI.6.8, VI.6.9.
[187] UNFSA. Article 16.
[188] Ibid. Article 7(1)(b).

Civil society, such as interested NGOs, academia or other relevant stakeholders, could play a significant role in discharging compliance functions with a view to operationalizing the principles of transparency, public participation and good governance. Moreover, the Aarhus Convention[189] could inspire the development of provisions to enhance public participation in the CRD Agreement, as "access to information and public participation in decision-making processes on environmental matters enhance the quality and the implementation of such decisions."[190] Although this Convention is a European instrument, it provides useful elements that could be incorporated in the CRD Agreement, such as: accountability and transparency, access to environmental information,[191] and public participation in decisions on specific activities which may have a significant effect on the environment.[192] This would also provide a useful mechanism to address seabed mining, extraction of oil and gas, and geo-engineering activities.

9.3.12 Settlement of disputes

As outlined by Professor Nilufer Oral, international law dispute settlement provisions should be compelling and create an incentive for States to fulfil their obligations.193 Several of the principles described at the beginning of this chapter, such as transparency and good governance, will guide and inform the application of the dispute settlement provisions in the new CRD instrument. In line with best practice in the law of the sea, they will be closely aligned with Part XV of UNCLOS194 and should apply mutatis mutandis to any dispute between States Parties to the CRD Agreement.195 There are a number of ways that this can be achieved in relation to compulsory settlement entailing binding decisions. For instance, Part VII in the UN Fish Stocks Agreement could be used as a model for developing specific dispute settlement provisions for the CRD framework. Similarly, some of the OSPAR features could be

[189] Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention). 2161 UNTS 447. Entered into force on 30 October, 2001.
[190] Ibid. Recital 9.
[191] Ibid. Article 4.
[192] Ibid. Article 6.
[193] Oral, above n 183, 273.
[194] OSPAR Convention. Article 32.
[195] UNFSA. Article 30.

replicated in the CRD Agreement as highlighted in chapter 6. In general, Parties would be compelled to settle disputes by peaceful means including by negotiation,[196] before resorting to options of non-contentious procedures in the form of inquiry or conciliation utilising the good offices of the CRD Commission for this purpose.[197] In relation to contentious procedures, ITLOS, the ICJ as well as Annex VII and Annex VIII arbitral tribunals could be used as a means of settling disputes about the interpretation and application of the CRD Agreement.[198] In relation to El Salvador, a non-party to UNCLOS, disputes could be submitted to the ICJ, or at the request of a Party to the Permanent Court of Arbitration. Additionally, any Contracting Party to the CRD Agreement that has a legal interest or that may be affected by a specific matter under dispute would have the possibility to intervene in dispute settlement proceedings.[199] Another proposed feature derives from both Part XV and the Antarctic Treaty system, where a written declaration from the Party indicates the means for the settlement of disputes,[200] again this could be modelled on article 30(4) of the UNFSA. Otherwise, the Party accepts the competence of an arbitral tribunal as the default dispute settlement forum.[201] Significantly, within the BBNJ negotiation process, some ideas have been discussed on this issue, including, the establishment of a special chamber in ITLOS for specific category of disputes pertaining to BBNJ.[202]

9.3.13 State responsibility and liability

In the Law of the Sea, the primacy of the responsibility rests with the flag State in relation to the high seas.[203] As seen, several multilateral instruments including the FAO Compliance Agreement and the FAO Port State measures have further developed flag and port State jurisdiction, addressing specific duties and responsibilities,[204] as well as procedures[205] by coastal, port[206] and flag States.[207] In addition, Part XI of UNCLOS

[196] Madrid Protocol. Article 18.
[197] OSPAR Convention. Article 32(1).
[198] Ibid. Article 32(3-10)
[199] Ibid. Article 32 (9).
[200] Madrid Protocol. Article 19.
[201] Ibid. Article 19(3).
[202] ITLOS Statutes. Article 15. See also: K. Kittichaisaree (2017) 'BBNJ Settlement of Disputes' *Side event at the Third Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, March 26 – April 7.
[203] UNCLOS. Article 92, 94, 217.
[204] For example FAO Compliance Agreement. Article III, IV, VI; and Port State Measure Agreement. Article 6, 9, Part II, III.
[205] UNFSA. Article 22.

includes obligations for States that are engaged in activities in the Area, and obliges them to exercise effective control over their national citizens, as well as addresses the liability of States and international organisations for damage caused by their failure to carry out their responsibilities.[208] Moreover, jurisprudence from ITLOS has addressed and advanced on the conditions for the liability of a sponsoring State on activities in the Area, and has determined that a sponsoring State is required to adopt, within its legal system, laws, regulations and administrative measures, to ensure compliance by the contractor with its obligations and to exempt the sponsoring State from liability.[209] Should seabed mining activities arise in the CRD, the relevant rule of international law pertaining to liability will apply to all States, including a Central American country that acts as a sponsoring State.

In the latter context, it is important to recall that Part XIII of UNCLOS contains rules on liability for damage caused by pollution of the marine environment from marine scientific research activities.[210] Likewise, other multilateral instruments explored in chapter 3 and 4 have developed similar provisions. For instance, the UNFSA established that States Parties are liable in accordance with international law for damage or loss attributable to them.[211] Similarly, as seen in chapter 4, the London Protocol calls for the development of procedures regarding liability arising from the dumping or incineration at sea of wastes.

There thus appears to be a compelling case supporting the establishment of a mandatory liability and compensation regime in the CRD Agreement including a liability fund. In order to operationalize such a scheme and following best practice under the Barcelona Convention, Contracting Parties should develop Guidelines on rules and procedures for the determination of liability and compensation for damage of the marine environment.[212] In this line, a crucial first step is the requirement of "harmonisation of national laws on liability and compensation in order to ensure

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[206] Ibid. Article 23.
[207] Ibid. Article 18 (i), Article 19 (b), Article 21 (2), (8), Article 22.
[208] UNCLOS. Article 139.
[209] *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, ITLOS Case No. 17 (Advisory Opinion) 2011.
[210] UNCLOS. Article 263.
[211] UNFSA. Article 35.
[212] Barcelona Convention. Article 16. The Guidelines could include: a) costs of activities and studies to assess the damage, b) costs of preventive measures, c) costs of measures undertaken to clean up, restore and reinstate the impaired environment, among other matters.

adequate compensation and to provide the greatest deterrence to polluting activities."[213] Furthermore, similar to the Barcelona Convention, Contracting Parties of the CRD could be required to include provisions on environmental damage compensation in their national legislation[214] and to impose liability on operators who cause damage to the marine environment.[215] In this context, the establishment of a compensation fund to address cases where damage exceeds the operator's liability, or where the operator is unknown, would ensure redress and compensation for damaging the marine environment in such cases.[216] Even though this financial feature taken from the Barcelona Convention is not yet in force, it is worth being included in the CRD Agreement with the view to ensure a solid scheme on liability and compensation, which could address the restoration of the marine ecosystem in the CRD and act also as a contingency fund in cases of pollution and other environmental emergencies.[217]

9.4 APPRAISAL OF LEX FERENDA

The discussion above provides a rudimentary outline of *lex ferenda* for the CRD in the form of new regional Agreement. The narrative is very much informed by the analysis undertaken in previous chapters and the regional case studies in particular in chapters 6 and 7. In exploring modalities in the design of new arrangements for the conservation and sustainable use of biodiversity in the ABNJ of the CRD, several options were canvassed including reliance on procedures and instruments that have non-binding legal character, similar to the Hamilton Declaration in relation to the Sargasso Sea. Although such an approach is attractive in so far as it provides for the development of a *sui generis* regime, it also runs a high risk of establishing a paper regime due to the absence of political support and suitable resources, as well as lacking all of the benefits that may be derived from a robust framework that is underpinned by the rule of law.

Accordingly, preference is placed with the second option, which is the development of hard law, in the form of a legally binding regional instrument for the ABNJ of the CRD. This clearly accords with the hypothesis underpinning the thesis. As seen, two

[213] Oral, above n 183, 281.
[214] *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, ITLOS Case No 17 (Advisory Opinion) [2011] ITLOS. Para. 8
[215] Ibid. Para. 17
[216] Ibid. Para. 29.
[217] Antarctic Treaty. Article 15 (b).

regulatory modalities are possible. The first is the expansion of ambit of the UNEP Antigua Convention, but as seen before, this option wouldn't be feasible, as it encounters complications and incongruities regarding the material scope, the geographical scope, governance arrangements, as well as the lack of political commitment that has surrounded the UNEP Antigua Convention since its opening for signature in 2002. For these reasons, a strong alternative approach is the development of an independent regional instrument for the ABNJ of the CRD, which sits comfortably with the UNEP Antigua Convention. Indeed, it could be negotiated and implemented as a Protocol to the UNEP Antigua Convention and both instruments could be used to comprehensively address the conservation and sustainable use of biodiversity and the marine environment both within and beyond national jurisdiction.

The architecture of the new CRD Agreement presented above will allow for the adoption of a discrete but specialized instrument focused on addressing the conservation, sustainable use and restoration of marine biodiversity and ecosystems in the ABNJ of the CRD. In addition, it is tailored to the reality of the Central American region, and will harmonize cooperation and collaboration mechanisms, while complementing existing instruments related to the different uses and activities taking place in the CRD. Crucially, the proposed scheme would not operate in isolation, but would coordinate and correlate to the various provisions and institutional arrangements that are already in place for the Eastern Central Pacific. Thereby, it would close longstanding lacunae and contribute to the development of comprehensive legal provisions for the conservation of biodiversity in ABNJ within the evolving landscape of regional environmental law.

CHAPTER 10. CONCLUSIONS AND RECOMMENDATIONS

10.1 CONCLUSIONS

The present study examines the legal and institutional frameworks, globally and regionally, as well as five regional case studies worldwide, addressing the conservation and sustainable use of marine biodiversity in ABNJ. The overall objective was to identify international best practices to inform the development of a new legally binding instrument for ABNJ of the CRD. On reflection, as noted by the great Yale scholars,[1] the major environmental provisions of the Law of the Sea Convention are "notable more for their deference to navigation interests than for their protection of the environment."[2] In counteracting this shortcoming by presenting a practical solution that is firmly rooted in the New Haven School of International Law;[3] which reflects a commitment to interdisciplinary research, the study of law as a process, the advancement of normative values, the connection of law and policy, as well as the recognition of the importance of transnational law as a creative means to build a public order of the ocean that organises the activities of transnational players in the interest of human dignity;[4] the main conclusions derived from the synthesis are as follows.

I. There is an urgent need for regional protection of biodiversity in areas of the CRD beyond national jurisdiction due to its unique juridical, geographical, environmental and socio-economic values and features. The CRD is a high productivity and geographically mobile area, mainly located in ABNJ, but which also straddles periodically the jurisdictional waters of five Central American countries. The outstanding scientific value of the marine biodiversity associated with the CRD is incontrovertible, yet exposed to serious threats and pressures from a variety of anthropogenic impacts and activities, namely: shipping traffic, overfishing and IUU fishing, climate change, ocean

[1] M. McDougal, W. T. Burke, *The Public Order of the Oceans*: *A Contemporary International Law of the Sea* (New Haven: New Haven Press/Martinus Nijhoff, 1962, 1985, 1987).
[2] Ibid. xxvii.
[3] W. M. Reisman; S. Wiessner.; A. R. Willard (2007) 'The New Haven School: A Brief Introduction,' *Faculty Scholarship Series*. Paper 959. See also: H. H. Koh, (2007) 'Is There a "New" New Haven School of International Law?,' *Yale J. Int'l L.*, Vol. 32.
[4] Ibid. 561-565.

acidification, and potential emerging uses such as geo-engineering and seabed mining. A dominant theme of the thesis is that there remain substantial regulatory gaps in scientific knowledge concerning the cumulative impact of activities on the marine environment of the CRD in ABNJ.

II. The existing multilateral and sector treaties do not adequately implement modern normative principles and approaches, such as the ecosystem-based approach or the precautionary principle, or provide a secure legal basis for the application of area-based management tools such as MPAs. This is compounded by the limited competence of multilateral and regional bodies, which remain focused on sector-specific activities such as fishing, shipping, mining, and marine scientific research. In addition, the absence of linkages between the different treaties and instruments makes them unsuitable to tackle crosscutting governance, conservation and management issues, or to effectively address the cumulative effects of the various anthropogenic impacts on the marine environment in ABNJ. Thus, cross-sectoral coordination and cooperation between regional and international bodies needs to be radically overhauled. Similarly, there needs to be effective implementation of ABMTs (FAO/VME, IMO/PSSA, ISA/APEI) and greater collaboration between the different regulatory regimes that apply in the CRD.

III. The Central American region has developed a legal and institutional framework to address the different activities related to marine resources and biodiversity. In this regard, within the SICA structure, CCAD, OSPESCA and COCATRAM could further advance marine conservation measures by ensuring the effective implementation of policies and strategies, and through the enhancement of regional coordination mechanisms. Nevertheless, the Achilles heel of this framework is its limited geographical scope, which is only applicable to EEZs and the sectoral approach of such bodies. This needs to be superseded by a regional body with competences in ABNJ and capable of reinforcing effective collaboration among the different sectors benefiting from the CRD. Likewise, other regional instruments present difficulties for properly protecting the marine environment in ABNJ. For example, even though the IATTC has geographical competence in ABNJ, it is a sector-based structure with a limited mandate incapable of integrally addressing conservation of biodiversity. Similarly, the

UNEP Antigua Convention from the North-East Pacific Regional Seas Programme, is currently unfit to effectively protect biodiversity in the ABNJ of the CRD because of its limited jurisdictional scope, as well as a clear lack of political commitment and the inadequacy of its governance schemes. Considerable care should nonetheless be exercised to ensure that the new Agreement does not bypass existing mechanisms in cases where they are patently unsuitable or unable to effect the necessary change.

IV. Regional frameworks under the UNEP umbrella and partnership programmes are dynamic and continuously evolving in light of new challenges in ocean governance. Five case studies were analysed in the present study and they all represent heterogeneous governance arrangements. Nonetheless, because the OSPAR and the Barcelona Conventions, and the Antarctic Treaty system, including CCAMLR, share many similar features, they ought to be carefully taken into considerations in designing new regulatory and governance arrangements for the CRD. Some notable features include: the establishment of MPAs in ABNJ; the implementation of legally binding conservation measures complemented by comprehensive Protocols or Annexes; the successful implementation of the principles of cooperation and coordination in the form of MoUs and Agreements with global organisations and joint measures across sectors and levels; the establishment of ABMTs; list-based tools for the protection of vulnerable species and habitats; the restoration of marine areas; engagement of civil society and other stakeholders; enhanced capacity building; and decision-making using the best available science. These case studies have followed an evolutionary approach to the development and articulation of international legal obligations into regional frameworks. In addition, the regimes in development under the Sargasso Sea Commission and CPPS are evolving into *sui generis* regional governance arrangements, amalgamating soft law and legally binding measures to fit unique bio-geographic features, as well as moving towards the adoption of more coherent and collaborative regulatory arrangements.

V. A key characteristic of all the case studies is the challenges posed by the lack of common principles, criteria and standards. These challenges also extend to legal lacunae and the lack of effective cross-sectoral coordination within the

overall legal and institutional framework applicable to ABNJ. In addition, science has significantly advanced, and a robust legally binding instrument and an institutional structure are prerequisites for success in the CRD. Compliance mechanisms, dispute settlement provisions, funding mechanisms and partnerships are additional prerequisites. They are some of the elements under negotiation at the United Nations.

VI. In time, an Implementation Agreement under UNCLOS can support regional experiences through addressing legal gaps and enhancing synergies among the different actors and stakeholders. Prospectively, a new Implementation Agreement ought to improve the performance of existing multilateral and regional bodies such as the IATTC by complementing and supplementing their core functions. In addition, it will also provide guidance on ABMTs, EIA/SEA, access and sustainable use of MGRs, as well as on capacity building and technology transfer. One of the tasks that needs to be addressed is how the new Implementation Agreement and the CRD Agreement will interrelate and retain the balance of rights and duties codified in UNCLOS.

VII. Small State diplomacy has been developing during the BBNJ negotiation process. The active participation of Costa Rica, as a recognized conservation leader, has steered discussions towards more ambitious schemes of conservation in ABNJ. In parallel, this country can influence further regional actions to protect biodiversity in the ABNJ of the CRD. It has already started raising awareness, in conjunction with NGOs, and positioning the CRD initiative in different international and regional forums.

10.2 RECOMMENDATIONS TO STRENGTHEN THE CONSERVATION OF MARINE BIODIVERSITY IN THE ABNJ OF THE CRD

I. The use of international law as a medium to organise the activities and relations of transnational players should be the primary goal of regional marine environmental law. Accordingly, Central American States and other actors should not maintain the weak structures for marine biodiversity protection in the CRD. Existing mechanisms therefore need to be strengthened as a priority and new regional arrangements need to be adopted forthwith. The *lex ferenda*

described in chapter 9 provides a coherent and innovative legal solution to ensure the conservation, sustainable use and restoration of marine biodiversity and ecosystems in the ABNJ of the CRD. One of its inherent strengths is that it is tailored to the reality of the Central American region.

II. The development of this hard law instrument could be proposed initially in the form of a Protocol of the UNEP Antigua Convention and both instruments could then be used to address comprehensively the conservation and sustainable use of biodiversity and the marine environment both within and beyond national jurisdiction.

III. The new CRD Agreement should build upon the various regulatory provisions and institutional arrangements that are already in place for the Eastern Central Pacific. The conclusion of MoUs or agreements between the institutional structure established through the CRD Agreement and other regional and global organisations will help establish a holistic, integral and cross-sectoral coordination and cooperation framework, and improve compliance with conservation and management measures.

IV. Irrespective of developments in the regulatory landscape, considerable efforts need to be made in strengthening marine scientific research and collaboration arrangements to improve capacity building, data collection and exchange, observer and monitoring programmes. This will undoubtedly help to close knowledge gaps and inform decision-making processes, such as marine spatial planning, and consequently improve conservation and management actions in the ABNJ of the CRD.

BIBLIOGRAPHY

Aguirre-Gómez, R.; Salmerón-García, O. (2012) 'Satellite observations of the effect of ENSO on the Tehuantepec and Papagayo upwellings,' *Revista de Ciencia y Tecnología de América,* Vol. 37(11).

Albert, M.; Ringbeck, B. *40 Years World Heritage Convention. Popularizing the Protection of Cultural and Natural Heritage* (Boston: De Gruyter, 2015).

Alexander, L. M. (1974) 'Regionalism and the Law of the Sea: The Case of Semi-enclosed Seas,' *Ocean Development and International Law*, Vol. 2(2).

Alexander, M.; Seo, H.; Xie, S.; Scott, J. (2012) 'ENSO's Impact on the gap wind regions of the Eastern Tropical Pacific Ocean,' *Journal of Climate*, Vol. 25(10).

Allen, C. (2009) 'Revisiting the Thames formula: The evolving role of the International Maritime Organisation and its Member States in implementing the 1982 Law of the Sea Convention,' *San Diego International Law Journal*, Vol. 10.

Ameer, A.; Linden, O., *Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures (*Malaga, Spain: IUCN Centre for Mediterranean Cooperation, 2008).

Amendment to the Convention on future Multilateral Cooperation in the Northwest Atlantic Fisheries. NAFO/GC Doc. 07/4.

Anda Montañez, J. A.; Martínez-Aguila, S.; Amador-Buenrostro, A.; Muhlia-Almazán, A. (2002) 'Spatial Analysis of the yellowfin tuna (*Thunnus albacares*) fishery, and its relation to El Niño and La Niña events in the Tropical Eastern Pacific,' *Investigaciones marinas*, Vol. 30(1).

Appiott, J. (2017) Unpublished paper. Presentation by the CBD Secretariat at the ATLAS side event. Third Session of the BBNJ Preparatory Committee. March 26 – April 7, United Nations Headquarters.

Antarctic and Southern Ocean Coalition (2013) 'Biological prospecting and the Antarctic environment,' *36th Antarctic Treaty Consultative Meeting*. Brussels, 20-29 May.

Antarctic and Southern Ocean Coalition (2014) *Incorporating climate change into CCAMLR's decision-making process*. Washington, DC: ASOC.

Antarctic Treaty Secretariat (2002) *Report of the Committee for Environmental Protection (CEP V)*. Buenos Aires: ATS Secretariat.

Antarctic Treaty. Recommendation IX-2. London, 1977.

Ardron, J.; Halpin, P.; Roberts, J.; Cleary, J.; Moftt, R.; Donnelly, B. (2011) *Where is the Sargasso Sea? A report submitted to the Sargasso Sea Alliance*. Washington, DC: Sargasso Sea Alliance.

Arnason, R.; Kelleher, K.; Willmann R. (2009) *The sunken billions, the economic justification for fisheries reform*. Washington DC: The World Bank.

ATLAS project (2017) 'Ocean-Scale Science for Effective Marine Governance: A New Approach to Managing Atlantic Ecosystems,' *Side event at the Third Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New Yor, March 26 – April 7.

Attard Gen, D. (ed.), *The IMLI Manual on International Maritime Law* Vols. 1-3 (Oxford: OUP, 2014-2016).

Attard, D.; Fitzmaurice, M.; Martinez, N.; Hamza, R. (eds.), *The IMLI Manual on International Maritime Law: Marine Environmental Law and International Maritime Security Law (*United Kingdom: Oxford University Press, 2016).

B. Zuleta, B. in Nordquist, M. (ed.), *United Nations Convention on the Law of the Sea 1982: A Commentary,* Vol. 1 (The Hague: Martinus Nijhoff ,1985).

Bache, S. (2003) 'Marine wildlife by-catch under the CMS: Progress and prospects,' *The International Journal of marine and coastal Law*. Vol 18(2).

Bailey, H. Mate, B.; Palacios, D.; Irvine, L.; Bograd, S.; Costa, D. (2009) 'Behavioural estimation of blue whale movements in the Northeast Pacific from state-space model analysis of satellite tracks', *Endangered Species Research,* Vol. 10.

Ballance, L.; Pitman, R.; Fiedler, P. (2006) 'Oceanographic influences on seabirds and cetaceans of the Eastern Tropical Pacific: A review,' *Progress in Oceanography*, Vol. 69(2–4).

Ban, N. C.; Bax, N.; Gjerde, K.; Devillers, R.; Dunn, D.; Dunstan, P.; Hobday, A.; Maxwell, S.; Kaplan, D.; Pressey, R.; Ardron, J.; Game, E.; Halpin, P. 'Systematic conservation planning: A better recipe for managing the High Seas for biodiversity conservation and sustainable use,' *Conservation Letters*. January/February 2014, 7(1).

Barbier, E.; Moreno Mateos, D.; Rogers, A.; Aronson, J.; Pendleton, L.; Danovaro, R.; Henry, L. A.; Morato, T.; Ardron, J.; Van Dover, C. (2011) 'Protect the deep sea,' *Nature*, Vol. 505.

Barnes, R. "Fisheries and marine biodiversity" in M. Fitzmaurice, D. Ong, P. Merkouris, *Research Handbook on International Environmental Law* (United Kingdom: Edward Elgar Publishing, 2010).

Barnes, R. (2016) 'The proposed LOSC Implementation Agreement on areas beyond national jurisdiction and its Impact on International Fisheries Law,*' The International Journal of Marine and Coastal Law*, Vol. 31.

Bell, S.; McGillivray, D.; Pedersen, O. *Environmental Law* (United Kingdom: Oxford University Press 2013).

Beltran, C. (2005) *East Central Pacific Ocean*. Rome: FAO.

Bernal, P.; Robles, F.; Rojas, O. (1990) 'Variabilidad física y biológica de la región meridional del sistema de corrientes Chile-Perú,' *Monografías Biol*ógicas, Pontificia Universidad Católica de Chile. Vol. 2.

Birnie, P; Boyle, A.; Redgwell, C. *International Law & the Environment* (Oxford: Oxford University Press, 2009) 3rd ed.

Boehlert, G. W. (1996) 'Biodiversity and the sustainability of marine fisheries;' *Oceanography*, Vol. 9.

Bowman, M. (2008) 'Normalizing the International Convention for the Regulation of Whaling' *Michigan Journal of International Law*, Vol. 29.

Bowman, M.; Davies, P.; Redgwell, C. 'The Convention on the Conservation of Migratory Species,' *Lyster's International Wildlife Law and Policy* (2010, 2nd ed.).

Brenes, C.; Lavin, M. F.; Mascarenhas, A. (2008) 'Geostrophic circulation between the Costa Rica Dome and Central America,' *Deep-Sea Research Part I Oceanographic Research Papers*, Vol. 55(5).

Bodansky, D. *The Art and Craft of International Environmental Law* (Cambridge: Harvard University Press, 2010)

Broenkow, W. (1965) 'The distribution of nutrients in the Costa Rica Dome,' *Limnology and Oceanography*, Vol. 10(1).

Burnett, D.; Beckman, B., Davenport, T. *Submarine Cables: The Handbook of Law and Policy* (Leiden/Boston: Brill/Nijhoff, 2015).

Burnett, D.; Freestone, D.; Davenport, T. (2015) *Submarine cables in the Sargasso Sea: legal and environmental issues in areas beyond national jurisdiction*. Washington, DC: ICPC/ Sargasso Sea Commission/ George Washington University Law School/ National University of Singapore.

Calder, D. (1995) 'Hydroid assemblages on holopelagic *Sargassum* from the Sargasso Sea at Bermuda,' *Bulletin of Marine Science*, Vol. 56.

Castellote, M.; Clark, C. W.; Lammers, M. O. (2010) *Potential negative effects in the reproduction and survival on fin whales (Balaenoptera physalus) by shipping and airgun noise, Report SC/62/E3*. United Kingdom: International Whaling Commission.

CBD Secretariat (2012) *Report on of the Wider Caribbean and Western Mid-Atlantic regional workshop to facilitate the description of ecologically or biologically significant marine areas*. Recife, Brazil: UNEP/CBD (U.N Doc. UNEP/CBD/SBSTTA/16/INF/7).

CBD Secretariat (2014) 'Ecologically or Biologically Significant Marine Areas (EBSAs): Special places in the world's oceans,' *CBD Wider Caribbean and Western Mid-Atlantic Regional Workshop*. Recife, Brazil, 28 February - 2 March 2012.

CBD. Jakarta Ministerial Statement on the Implementation of the Convention of Biological Diversity.

CCAD (2014) *Regional Environmental Strategy 2015-2020*. El Salvador: CCAD.

CCAMLR (2012) *Report of the 31st meeting of the Commission*. Hobart: CCAMLR.

CCAMLR Conservation Measure 91-04 (2011).

CCAMLR Review Panel (2008) *CCAMLR performance Report*. Australia: CCAMLR.

CCAMLR Scientific Committee (2004) *Report of the 23th meeting of the Scientific Committee*. Hobart: CCAMLR.

CCAMLR Scientific Committee (2008) *Report of the 27th meeting of the Scientific Committee*. Hobart: CCAMLR.

CCAMLR. Conservation measure 10-05 (2016).

CCAMLR. Conservation Measure 10-08 (2009).

CCAMLR. Conservation measure 21-03 (2016).

CCAMLR. Conservation Measure 22-04 (2010).

CCAMLR. Conservation Measure 22-05 (2008).

CCAMLR. Conservation Measure 22-06 (2015).

CCAMLR. Conservation measure 22-08 (2009).

CCAMLR. Conservation Measure 22-09 (2012).

CCAMLR. Conservation measure 23-06 (2012).

CCAMLR. Conservation measure 24-04 (2016).

CCAMLR. Conservation Measure 26-01 (2015).

CCAMLR. Conservation Measure 32-18 (2006).

CCAMLR. Conservation measure 41-01 (2016).

CCAMLR. Conservation measure 41-03 (2016).

CCAMLR. Conservation measure 51-02 (2008).

CCAMLR. Conservation measure 51-03 (2008).

CCAMLR. Conservation measure 51-04 (2016).

CCAMLR. Conservation measure 51-06 (2016).

CCAMLR. Conservation measure 51-07 (2016).

CCAMLR. Conservation Measure 91-01 (2004).

CCAMLR. Conservation Measure 91-02 (2012).

CCAMLR. Conservation Measure 91-03 (2009).

CCAMLR. Conservation Measure 91-04 (2011).

CCAMLR. Conservation Measure 91-05 (2016).

CCAMLR.Conservation measure 32-09 (2016).

Center for Ocean Solutions (2009). *Pacific Ocean Synthesis: Scientific Literature Review of coastal and ocean threats, impacts, and solutions*. The Woods Center for the Environment, Stanford University. California.

Centre for resource management and Environmental studies (2007) *Sub-Regional, Regional and International Stakeholder Assessment Report*. Jamaica: University of the West Indies.

Charney, J.; Smith, R. (eds.), *International Maritime Boundaries* (The Hague: Martinus Nijhoff Publishers, 2002) Vol. 4.

Chircop, A. 'The International Maritime Organisation,' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015).

Churchill, R. 'The LOSC regime for protection of the marine environment,' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing, 2015).

Churchill, R. 'The persisting problem of non-compliance with the Law of the Sea Convention: disorder in the oceans' in D. Freestone (ed.) *The 1982 Law of the Sea Convention at 30: Successes, Challenges and New Agendas* (The Hague: Martinus Nijhoff Publishers, 2013).

Clark, C. W.; Ellison, W.; Southall, B.; Hatch, L.; Van Parijs, S.; Frankel, A.; Ponirakis, D. (2009) 'Acoustic masking in marine ecosystems: intuitions, analysis, and implication,' *Marine Ecology Progress Series*, Vol. 395.

COCATRAM (2013) *Origen y destino de la carga en Centroamérica*. Nicaragua: COCATRAM.

COCATRAM (2014) *Central American Regional Maritime and Port Strategy*. Nicaragua: COCATRAM.

Committee for Environmental Protection (2007) *Procedures for intersessional CEP consideration of draft CEEs. CEP X*. Buenos Aires: ATS Secretariat.

Consejo de Representantes de Autoridades Científicas CITES de Costa Rica (CRACCITES - Costa Rica). 28 marzo, 2017. Dictamen de Extracción No Perjudicial (DENP) para el tiburón martillo común (*Sphyrna lewini*) y las dos especies semejantes (*S. zygaena* y *S.*

mokarran) de Costa Rica, incluidas bajo el Apéndice II de la Convención Sobre el Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestres (CITES). San José, Costa Rica.

Constable, A.; de la Mare, W.; Agnew, D.; Everson, I.; Miller, D. (2000) 'Managing fisheries to conserve the Antarctic marine ecosystem: Practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR),' *ICES Journal of Marine Science*. Vol. 57.

Cordes, E. (2014) 'Costa Rican Margin,' *Workshop on telepresence-enabled exploration of the Eastern Pacific Ocean*. California, 11-13 December.

Corley, J. (2016) 'OSPAR and the collective arrangement,' *Side event at the Second Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, 6 September.

Cormier, R.; Kelbe, C.; Anderson, R.; Allen, J.; Grehan, A.; Gregersen, O.; Link, J. (2017) 'Moving from ecosystem-based policy objectives to operational implementation of ecosystem-based management measures.' *ICES Journal of Marine Science*, Vol. 74 (1).

CPPS. Galápagos Commitment for the XXI Century. VIII Meeting of Ministers of Foreign Affairs. Galápagos, Ecuador, 17 August 2012.

Craik, N. *The International Law of Environmental Impact Assessment: Process, Substance and Integration* (Cambridge: University Press, 2010).

Cromwell, T. (1958) 'Thermocline topography, horizontal currents and ridging in the Eastern Tropical Pacific,' *Inter-American Tropical Tuna Commission Bulletin*, Vol. 3(3).

CSIRO (2017) 'The role of marine values,' *Side event at the Third Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, March 26 – April 7.

Cubero Pardo, P.; Martínez Cascante, D. A. (2013) *Análisis de la pesquería de atún en la zona económica exclusiva del Pacífico de Costa Rica*. Costa Rica: FECOP.

Davies, P. G.; Redgewell, C. (1996) 'The international legal regulation of straddling fish stocks,' *British Yearbook of International Law*, Vol. 6.

Delegation of Australia and New Zealand (2009) 'Regulation of biological prospecting under the Antarctic Treaty system,' *32nd Antarctic Treaty Consultative Meeting*. USA, 6-17 April.

Delegation of Ukraine (2013) 'On absence of legal ability to organize marine protected areas in the high seas of the World Ocean, including the Antarctic waters,' *Second special meeting of CCAMLR*. Germany, 31 May.

Di Carlo, G.; Lopez, A.; Staub, F. (2012) *Report: Capacity building strategy to enhance the management of MPAs in the Mediterranean Sea*. Commissioned by WWF MedPO/MedPAN/UNEP/MAP/RAC/SPA.

DiMasi, J. A.; Grabowski, H.; Hansen, R. (2016) 'Innovation in the pharmaceutical industry: new estimates of R&D costs,' *Journal of Health Economics*. Vol. 47.

Diz, D. (2016) 'The seamounts of the Sargasso Sea: Adequately protected?,' *The International Journal of Marine and Coastal Law*, Vol. 31.

Dossier, A.; Donguy, J. R. (1987) 'Modification of copepod population in relation to physical properties during the 1982-83 El Niño,' *AGU-IOC-WMO-CPPS Chapman Conference: An international symposium on "El Niño."* Ecuador, 27-31 October.

Douglas, L.; Beaver, D.; Turner, J.; Nicoll, R. (2016) *An identification of areas within the high seas of the Southern Ocean that would contribute to a representative system of MPAs*. Australia: CCAMLR. (WS-MPA-11/16).

Druel, E. (2013) *Environmental impact assessments in areas beyond national jurisdiction: identification of gaps and possible ways forward*. Paris: IDDRI. (Studies N°01/13).

Duarte, C. 'Marine Biological Diversity of Areas Beyond National Jurisdiction: Jurisdiction in relation to submarine cables' at the International Cable Protection Committee's 2017 Plenary Meeting, Montevideo, Uruguay, 21 April 2017. Unpublished paper.

Dunn, D.; Ardron, J.; Bax, N.; Bernal, P.; Cleary, J.; Cresswell, I.; Donnelly, B.; Dunstan, P.; Gjerde, K.; Johnson, D.; Kaschner, K.; Lascelles, B.; Rice, J.; Von Nordheim, H.; Wood, L.; Halpin, P. (2014) 'The Convention on Biological Diversity's Ecologically or Biologically Significant Areas: Origins, development, and current status', *Marine Policy*, Vol. 49, 137-145.

Dunn, D.; Ortuno Crespo, G.; Vierros, M.; Halpin, P. (2017) *Adjacency: How legal precedent, ecological connectivity and traditional knowledge inform our understanding of proximity*. Japan: Nippon Foundation - Nereus Programme.

Edeson, W. R. (1996) 'The Code of Conduct for Responsible Fisheries, an introduction,' *The International Journal of Marine and Coastal Law, Vol. 11(2)*.

Ehrhardt, N.; Fitchett, M. (2006) 'On the seasonal dynamic characteristics of the sailfish, *Istiophorus platypterus*, in the Eastern Pacific of Central America,' *Bulletin of Marine Science,* Vol. 79(3).

Eriksen, M.; Lebreton, L.; Carson, H.; Thiel, M.; Moore, C.; Borerro, J.; Galgani, F.; Ryan, P.; Reisser, J. (2014) 'Plastic pollution in the World's Oceans: More than 5 trillion plastic pieces weighing over 250,000 tons afloat at sea,' *PLoS ONE*, Vol. 9(12).

European Environment Agency, *Marine protected areas in Europe's seas: An overview and perspectives for the future* (Luxembourg: EEA, 2015).

European Union Council Regulation No. 1100/2007, 18 September 2007.

European Union Delegation (2011) *Antarctic krill and climate change*. Netherlands: CCAMLR. (CCAMLR-XXX/BG/03).

Evans, S. (1999) 'The Green Republic: A Conservation History of Costa Rica,' *Journal of Political Ecology: Case Studies in History and Society*. Vol. 6.

FAO (1996), *Precautionary approach to capture fisheries and species introductions*. FAO Technical Guidelines for Responsible Fisheries No. 2. FAO: Rome.

FAO (2001) *International Plan of Action to Deter, Prevent and Eliminate Illegal, Unreported and Unregulated Fishing. (IPOA IUU)*. Rome: FAO.

FAO (2009) *Deep-sea fisheries in the high seas: Ensuring sustainable use of marine resources and the protection of vulnerable marine ecosystems*. Rome: FAO.

FAO (2009*) International Guidelines for the Management of Deep-sea Fisheries in the High Seas*. Rome: FAO. Annex.

FAO (2009) *Report of the FAO/UNEP expert meeting on impacts of destructive fishing practices, unsustainable fishing, and illegal, unreported and unregulated (IUU) fishing on marine biodiversity and habitats*. Rome: FAO.

FAO (2012) *The State of World Fisheries and Aquaculture 2012*. Rome.

FAO (2014) *Contribución de la pesca y la acuicultura a la seguridad alimentaria y el ingreso familiar en Centroamérica*. Panama.

FAO. 2011. *Review of the state of world marine fishery resources*. Fisheries and Aquaculture Technical Paper No. 569, 177.

FAO. 2016. *The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all.* Rome.

Fernández-Álamo, M; Färber-Lorda, J. (2006) 'Zooplankton and the oceanography of the Eastern Tropical Pacific: A review.' *Progress in Oceanography*, Vol. 69(2).

Fiedler, P. (2002) 'The annual cycle and biological effects of the Costa Rica Dome,' *Deep Sea Research I*, Vol. 49.

Fiedler, P.; Talley, L. (2006) 'Hydrography of the Eastern Tropical Pacific: a review,' *Progress in Oceanography*, Vol. 69.

First Session of the Preparatory Committee. UN Headquarters, New York. 28 March to 8 April 2016.

Fisher, C.; Montagna, P.; Sutton, T. (2016) 'How did the Deep-water Horizon oil spill impact deep-sea ecosystems?,' *Oceanography*, Vol 29.

Fitzmaurice, M. *Whaling and International Law* (Cambridge: CUP, 2015).

Forcada, J.; Notarbartolo di Sciara, G. Fabbri, F. (1995) 'Abundance of fin whales and striped dolphins summering in the Corso-Ligurian Basin,' *Mammalia*, Vol. 59(1).

Francioni, F.; Lenzerini, F.*The 1972 World Heritage Convention: A commentary* (Oxford: Oxford University Press, 2008).

Franck, E. (1998) 'Regional Marine Environmental Protection Regimes in the context of UNCLOS,' *International Journal of Marine and Coastal Law*, Vol.13

Franck, E. (2000) '*Pacta Tertiis* and the Agreement for the implementation of the straddling and highly migratory fish stocks provisions of the United Nations Convention on the Law of the Sea,' *Tulane Journal of International and Comparative Law*, Vol. 8.

Freestone, D. (1999) 'Implementing precaution cautiously: The precautionary approach in the straddling and highly migratory fish stocks Agreement,' in E. Hey (ed.), *Developments in International Fisheries Law* (The Netherlands: Brill-Nijhoff, 1999).

Freestone, D. (2008) 'Principles applicable to modern Oceans Governance,' *International Journal of Coastal and Marine Law*, Vol. 23(3).

Freestone, D. (2011) 'Advisory Opinion of the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea,' *ASIL Insights*, Vol. 15.

Freestone, D. (2013) 'The final frontier: The Law of the Sea Convention and areas beyond national jurisdiction,' *U. C. Berkeley and the Korea Institute of Ocean Science and Technology Conference*. Korea, 21-24 May.

Freestone, D. (2014) 'Can existing institutions protect biodiversity in areas beyond national jurisdiction? Experiences from two on-going processes,' *Marine Policy*, Vol. 49.

Freestone, D. (2016) 'Governance of areas beyond national jurisdiction: An unfinished agenda,' in J. Barrett, R. Barnes (eds.), *Law of the Sea: UNCLOS as a Living Treaty* (London: BIICL, 2016).

Freestone, D.; Bulger, F. (2016) 'The Sargasso Sea Commission: An innovative approach to the conservation of areas beyond national jurisdiction,' *Ocean Yearbook Online*, Vol. 30.

Freestone, D.; Burnett, D.; de Juvigny, A. T. Davenport (2015) 'Submarine Telecommunication Cables in the Sargasso Sea,' *The International Journal of Marine and Coastal Law*, Vol. 30(2).

Freestone, D.; Johnson, D.; Ardron, J.; Morrison, K.; Unger, S. (2014) 'Can existing institutions protect biodiversity in areas beyond national jurisdiction? Experiences from two on-going processes,' *Marine Policy*, Vol. 49.

Freestone, D.; Laffoley, D.; Douvere, F.; Badman, T. (2016) *World Heritage in the High Seas: An Idea Whose Time Has Come*. Paris: UNESCO.

Freestone, D.; Morrison, K. (2012) 'The Sargasso Sea Alliance: Seeking to Protect the Sargasso Sea,' *The International Journal of Marine and Coastal Law*, Vol. 27.

Freestone, D.; Morrison, K. (2014) 'The signing of the Hamilton Declaration on collaboration for the conservation of the Sargasso Sea: A new paradigm for high seas conservation?,' *The International Journal of Marine and Coastal Law*, Vol. 29.

Freestone, D.; Varmer, O.; Bennett, M.; Wilhelm, T. A.; Beuttler, T. M.; Ardron, J.; Maxwell, S.; Morrison, K. (2014) 'Place-based dynamic management of large scale ocean places: Papahānaumokuākea and the Sargasso Sea,' *Stanford Environmental Law Journal*, Vol. 33(2).

French, D. (2011) 'From the Depths: Rich pickings of principles of sustainable development and general international law on the ocean floor – the Seabed Disputes Chamber's 2011 Advisory Opinion,' *International Journal of Marine and Coastal Law*, Vol. 26(4).

Friedrich, J. (2010) 'Legal challenges of non-binding Instruments: The case of the FAO Code of Conduct for Responsible Fisheries,' in A. von Bogdandy et. al. (eds.). *The exercise of public authority by International Institutions* (Heidelberg; New York: Springer, 2010).

Gabrié, C.; Lagabrielle, E.; Bissery, C.; Crochelet, E.; Meola, B.; Webster, C.; Claudet, J.; Chassanite, A.; Marinesque, S.; Robert, P.; Goutx, M.; Quod, C.*The Status of the Marine Protected Areas in the Mediterranean Sea* (France: MedPAN & RAC/SPA, 2012).

Garcia, S. 'Governance, science, and society: The ecosystem approach to fisheries,' in R. Grafton, et. al. (eds.) *Handbook of Marine Fisheries Conservation and Management* (Oxford: Oxford University Press, 2010).

GESAMP, 'Sources, Fate and Effects of Microplastics in the Marine Environment: Part 2 of a Global Assessment' (London: IMO, 2015).

Gianni, M.; Currie, D. (2016) 'Conservation of deep-sea biodiversity in areas beyond national jurisdiction: A ten year review of the implementation of the UNGA Resolutions on bottom fisheries,' *Side event at the Second Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, 26 August – 9 September.

Gillespie, A. (2001) 'Small Cetaceans, International law and the International Whaling Commission,' *Melbourne Journal of International Law*, Vol. 12(2).

Gillespie, A. *Whaling Diplomacy*: *Defining issues in International Environmental Law* (Cheltenham: Edgar Elgar, 2005).

Giorgi, F. (2006) 'Climate change hot spots,' *Geophysical Research Letter*s, Vol. 33.

Gjerde, K. 'High seas fisheries management under the Convention on the Law of the Sea' in R. Barnes, D. Freestone, D. Ong (ed.), *The Law of the Sea–Progress and Prospects* (Oxford: Oxford University Press, 2006).

Gjerde, K. (2008) *Regulatory and governance gaps in the International regime for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction*. Switzerland: IUCN.

Gjerde, K., 'High seas fisheries governance: Prospects and challenges in the 21st century' in D. Vidas, P. J. Schei (eds.), *The world ocean in globalisation: Challenges and responses* (The Netherlands: Martinus Nijhoff Publishers, 2011).

Gjerde, K. (2012) 'Challenges to protecting the marine environment beyond national jurisdiction,' *The International Journal of Marine and Coastal Law,* Vol. 27(4).

Gjerde, K. (2016) 'Beyond the Horizon: Overview of current environmental governance in marine areas beyond national jurisdiction,' *Informal meeting to consider the environmental elements of a new international instrument for the conservation and sustainable use of marine biodiversity beyond national jurisdiction*. Costa Rica, 16-18 February.

Glover, A.; Smith, C. (2003) 'The deep-sea floor ecosystem: current status and prospects of anthropogenic change by the year 2025,' *Environmental Conservation*, Vol. 30 (3).

Glowka, L. (2000) 'Complementarities between the CMS and CITES', *Journal of International Law and Policy*, Vol. 3.

Gollock, M. (2011) *European eel briefing note for Sargasso Sea Alliance*. Washington, DC: Sargasso Sea Alliance.

Gomez, C.; Lawson, J. W.; Wright, J. A.; Buren, A. D.; Tollit, D.; Lesage, V. (2016) 'A systematic review on the behavioural responses of wild marine mammals to noise: The disparity between science and policy,' *Canadian Journal of Zoology,* Vol. 94.

Gould, J.; Eichstedt, C. (2014) 'Revolution and Reaction in Central America,' *Oxford* Bibliographies in Latin American Studies.

Gregory, M. (2009) 'Environmental implications of plastic debris in marine settings-entanglement, ingestion, smothering, hangers-on, hitch-hiking and alien invasions,' *Philos Trans. R. Soc. Lond. B Biol. Sci.,* Vol. 364.

Guilfoyle, D. 'The High Seas' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: Oxford University Press, 2015).

Gutic, J. (1993) *Economic valuation of the Las Baulas de Guanacaste National Park: evaluation of the benefits received by the local users of their natural resources*. Unpublished Master of Science thesis. University for Peace. San José, Costa Rica.

Halfar, J.; Fujita, R. (2007) 'Danger of deep-sea mining,' *Science*, Vol. 316.
Hallett, J. (2011) *The importance of the Sargasso Sea and the offshore waters of the Bermudian Exclusive Economic Zone to Bermuda and its people*. Washington, DC: Sargasso Sea Alliance.

Halpern, B.; Walbridge, S., Selkoe, K. A.; Kappel, C.V.; Micheli, F.; D'Agrosa, C.; Bruno, J. F.; Casey, K. S.; Ebert, C.; Fox, H.E.; Fujita, R.; Heinemann, D.; Lenihan, H. S.; Madin, E.M.; Perry, M. T.; Selig, E. R.; Spalding, M.; Steneck, R.; Watson, R. (2008) 'A Global Map of Human Impact on Marine Ecosystems,' *Science,* Vol. 319.

Hardin, G. (1968) 'The tragedy of the global commons,' *Science*. Vol. 162

Heinze, C.; Meyer, S.; Anderson, L.; Goris, N.; Steinfeldt, R.; Chang, N.; Le Quéré, C.; Bakker, D. C. (2015) 'The ocean carbon sink - impacts, vulnerabilities and challenges,' *Earth Syst. Dynam*., Vol. 6.

Hemphill, A. (2005) 'Conservation on the high seas-drift algae habitat as an open ocean cornerstone. High seas marine protected areas,' *Parks*, Vol. 15(3).

Hey, E.; Ijlstra, T.; Nollkaemper, A. (1993) 'The 1992 Paris Convention for the protection of the marine environment of the North-East Atlantic: A critical analysis,' *International Journal of Marine and Coastal Law*, Vol. 8(1).

High Seas Alliance. Sectoral challenges in ABNJ. Internal working document. 2016.

High Seas Task Force (2006) *Closing the Net: Stopping illegal fishing on the high seas. Final report of the Ministerially-led Task Force on IUU Fishing on the High Seas*. United Kingdom: UK Department for Environment, Food and Rural Affairs.

Hoegh-Guldberg, O.; Bruno, J. F. (2010) 'The impact of climate change on the World's marine ecosystems,' *Science*, Vol. 28.

Hoop, J.; Vanderlaan, A.; Cole, T.; Henry, A.; Hall, L.; Mase-Guthrie, B.; Tonya Wimmer, T.; Moore, M. (2015) 'Vessel strikes to large whales before and after the 2008 ship strike rule,' *Conservation Letters*.

Hoydal, K.; Hole, A. H. 'Regional governance: the case of NEAFC and OSPAR,' in S. M. Garcia, J. Rice, A. Charles (eds.*) Governance for Fisheries and Marine Conservation: Interaction and co-evolution* (United Kingdom: Wiley-Blackwell, 2014).

Hoyt, E.; Iñíguez, M. (2008) *The State of Whale Watching in Latin America*, WDCS, Chippenham, UK; IFAW, East Falmouth, USA; and Global Ocean, London.

Hoyt, E.; Tetley, M. (2011) 'The Costa Rica Dome: Building a case for place-based management of blue whales on the high seas,' *Second Conference on marine mammal protected areas*, Martinique 7-11 November.

Hubert, A. 'Marine Scientific Research and the protection of the seas and oceans' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015).

IAC. Promotion of the conservation of sea turtles and its relation to the United Nations General Assembly Resolution 69/292. COP8-2017-Doc.3. CoP 8th Argentina 28-30 June, 2017.

ICCAT (2013) *Report for biennial period 2012-2013*. Madrid: ICAAT.

ICCAT (2016) *An assessment of the ecological importance of the Sargasso Sea to tuna and tuna-like species and ecologically associated species*. Canada: ICAAT, 2011.

Ichii, T.; Mahapatra, K.; Okada, Y. (2002) 'Occurrence of jumbo flying squid Dosidicus gigas aggregations associated with the countercurrent ridge off the Costa Rica Dome during 1997 El Niño and 1999 La Niña,' *Marine Ecology Progress Series,* Vol. 231.

ICWR. Schedule amended by the Commission at the 65th Meeting Portorož, Slovenia, September 2014.

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (97).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (98).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (99).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25(100).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (101).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (102).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (103).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (104).

IISD (2016) 'PrepCom 1 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (105).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (109).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (110).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (111).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (112).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (114).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (115).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (116).

IISD (2016) 'PrepCom 2 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (117).

IISD (2017) 'PrepCom 3 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (125).

IISD (2017) 'PrepCom 3 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (126).

IISD (2017) 'PrepCom 3 highlights,' *Earth Negotiations Bulletin*. Vol. 25 (127).

IISD (2016) 'PrepCom 1 highlights: Capacity Building,' *Earth Negotiations Bulletin*. Vol. 25(100).

IISD (2016) 'PrepCom 1 Highlights: EIAs,' *Earth Negotiations Bulletin*, Vol. 25(100).

IISD (2016) 'PrepCom 1 highlights: Marine Genetic Resources,' *Earth Negotiations Bulletin*. Vol. 25(99).

IISD (2016) 'PrepCom 1 highlights: Marine Genetic Resources,' *Earth Negotiations Bulletin*. Vol. 25(105)

IISD (2016) 'PrepCom 1 highlights: Technology Transfer,' *Earth Negotiations Bulletin*. Vol. 25(104).

IISD (2016) 'PrepCom 2 highlights: Marine Genetic Resources,' *Earth Negotiations Bulletin*. Vol. 25 (109).

IISD (2016) 'Summary of the first session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(106).

IISD (2016) 'Summary of the second session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25(118).

IISD (2017) 'PrepCom 3 highlights: Marine Genetic Resources,' *Earth Negotiations Bulletin*. Vol. 25 (120).

IISD (2017) 'Summary of the third session of the preparatory committee on marine biodiversity beyond areas of national jurisdiction,' *Earth Negotiations Bulletin*. Vol. 25 (129).

Inter-American Tropical Tuna Commission (2016) *Tunas, billfishes and other pelagic species in the Eastern Pacific Ocean*. Fishery Status Report No. 14.

Inter-American Convention for the Protection and Conservation of Sea Turtles (2014) 7th meeting of the Consultative Committee of Experts. CCE7-2014-Doc.3.

Inter-American Tropical Tuna Commission (2012) *Tunas and billfishes in the Eastern Pacific Ocean in 2012*.

Inter-American Tropical Tuna Commission (2013) *Tunas, billfishes and other pelagic species in the Eastern Pacific Ocean*, Fishery Status Report No. 11.

Inter-American Tropical Tuna Commission (2014) *Tunas and billfishes in the Eastern Pacific Ocean*. Fishery Status Report No. 12.

Intergovernmental Panel on Climate Change (2015) *Climate Change 2014: Synthesis Report*. Switzerland: IPCC.

IOC (2016) *IOC potential contribution to a new international instrument under UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction*. Paris: UNESCO. (IOC/INF-1338).

IPCCC (2005) *Special Report on carbon dioxide capture and storage*. Cambridge: Cambridge University Press Cambridge.

ISA (2015) *Developing a regulatory framework for mineral exploitation in the Area: A discussion paper on the development and implementation of a payment mechanism in the Area for consideration by members of the Authority and all stakeholders*. Kingston: ISA.

ISA. Document ISBA/21/A/INF/2, 26 May 2015.

ISA. Environmental management Plan for the Clarion-Clipperton Zone. ISBA/17/LTC/7.

IUCN (2016) *The IUCN Red List of Threatened Species. Version 2016-3*.

IWC (1983) *Thirty-Third Report of the International Whaling Commission*. Cambridge, UK: IWC.

IWC (1990) *Fortieth Report of the International Whaling Commission*. Cambridge, UK: IWC.

IWC (1992) *Forty-Second Report of the International Whaling Commission*. Cambridge, UK: IWC.

IWC (1993) *Forty-Third Report of the International Whaling Commission*. Cambridge, UK: IWC.

IWC (1994) *Forty-Fourth Report of the International Whaling Commission*. Cambridge, UK: IWC.

IWC (1996) *Forty-Sixth Report of the International Whaling Commission*. Cambridge, UK: IWC.

IWC (2016) *Report of the 65th Meeting of the International Whaling Commission*. Cambridge, UK: IWC.

Jaeckel, L. *The International Seabed Authority and the Precautionary Principle* (Boston: Brill Nijhoff, 2017).

Jaspar, M. (2016) 'Bioprospecting from marine genetic resources from areas beyond national jurisdiction,' *All day workshop on marine genetic resources in Areas Beyond National Jurisdiction*. New York University Law School, 27 August 2016. Unpublished presentation.

Jiménez, J. A. *The Thermal Dome of Costa Rica: An oasis of productivity off the Pacific coast of Central America* (San José, Costa Rica: MarViva, 2017).

Johnson, D. (2008) 'Environmental indicators: Their utility in meeting the OSPAR Convention's regulatory needs,' *ICES Journal of Marine Science*, Vol. 65.

Johnson, D.; Ardron, J.; Billet, D.; Corcoran, E. (2014) 'When is a marine protected area network ecologically coherent? A case study from the North-east Atlantic,' *Aquatic Conservation: Mar. Fresh W. Ecosyst*, Vol. 24.

Jorda, M.; Mosqueira, I.; Freire, J.; Dulvy, N. (2013) 'The conservation and management of tunas and their relatives: Setting life history research priorities,' *Plos One*. Vol. 8.

Kahru, M.; Fiedler, P.; Gille, S.; Manzano, M.; Mitchel, G. (2007) 'Sea level anomalies control phytoplankton biomass in the Costa Rica Dome area,' *Geophysical Research Letters*, Vol. 34(22).

Kayes, S. (2016) 'Technology and Maritime Enforcement: Is International Law Ready for the Future?,' *Legal Order in the World's Oceans: UN Convention on the Law of the Sea. 40th Annual Conference of the Center for Oceans Law and Policy*. United Nations Headquarters, New York. June 27.

Kelly, S.; Erin L. LaCasella, E.; Roden, S.; Jensen, M.; Stokes, L.; Epperly, S.; Dutton, P. (2016) 'Nesting population origins of leatherback turtles caught as by-catch in the U.S. pelagic long-line fishery,' *Ecosphere*, Vol. 7(3).

Kerr, R. A. (2014) 'The coming copper peak,' *Science*, Vol. 343.

Kessler, W. (2006) 'The circulation of the Eastern Tropical Pacific: A review,' *Progress in Oceanography*, Vol. 69.

Khee-Jin Tan, A. *Vessel source marine pollution: The law and politics of international regulation* (Cambridge: Cambridge University Press, 2006).

Klein, N.; Mossop, J.; Rothwell, D. *Maritime Security: International Law and Policy Perspectives from Australia* (London: Routledge, 2010), 314; and D. Rothwell (2012) 'Polar Ocean Governance in the 21st Century,' *Ocean Yearbook*, Vol. 26.

Knowlton, A. R.; Kraus, S. D. (2001) 'Mortality and serious injury of northern right whales (*Eubalaena glacialis*) in the western North Atlantic Ocean,' *Journal of Cetacean Research and Management*.

Kobayashi, M.; Arnason, R. (2016) *The Sunken Billions Revisited. Progress and challenges in global marine fisheries*. Washington, DC: The Wolrd Bank.

Kovats, R. S.; Bouwer, L M.; Georgopoulou, E.; Jacob, D.; Martin, E.; Rounsevell, M.; Soussana, J. F. (2014) 'Europe' in *Climate Change 2014: Impacts, adaptation, and vulnerability. Part B: Regional aspects. Contribution of working group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, (United Kingdom and New York: Cambridge University Press, 2014).

Lacoue-Labarthe, T.; Nunes, P.; Ziveri, P.; Cinar, M.; Gazeau, F.; Hall-Spencer, J. M.; Hilmi, N.; Moschell, P.; Sauzada, D.; Turtle, C. 'Impacts of ocean acidification in a warming Mediterranean Sea: An overview,' *Regional Studies in Marine Science*, Vol. 5.

Laffoley, D. (2011) *The protection and management of the Sargasso Sea: The golden floating rainforest of the Atlantic Ocean. Summary Science and Supporting Evidence Case*. Washington, DC: Sargasso Sea Alliance.

Laffoley, D.; Langley, J. (eds.) (2010) *The Bahrain Action Plan for Marine World Heritage. Identifying priorities for marine World Heritage and enhancing the role of the World Heritage Convention in the IUCN WCPA Marine Global Plan of Action for MPAs in our Oceans and Seas*. Switzerland: IUCN.

Laist, D. W.; Knowlton, A. R.; Mead, J. G.; Collet, A. S.; Podesta, M. (2001) 'Collisions between ships and whales,' *Marine Mammal Science*, Vol. 17 (1).

Langlet, D.; Mahmoudi, S., *EU environmental Law and Policy* (Oxford: OUP, 2016), 39-40.

Law, K.; Morét-Ferguson, K.; Maximenko, N.; Proskurowski, G.; Peacock, E.; Hafner, J.; Reddy, C. (2010) 'Plastic accumulation in the North Atlantic Subtropical Gyre,' Science, Vol. 329.

Law, K.; Morét-Ferguson, S.; Goodwin, D.; Zettler, E.; DeForce, E.; Kukulka, T.; Proskurowski, G. (2014) 'Distribution of surface plastic debris in the Eastern Pacific Ocean from an 11-year dataset,' *Environ. Sci. Technol.,* Vol. 48.

Le, T.; Levin, L.; Carson, R. (2016) 'Incorporating ecosystem services into environmental management of deep-seabed mining,' *Deep Sea Research Part II: Topical Studies in Oceanography*, Vol. 141.

Letter from the Co-Chairs of the Ad Hoc Open-ended Informal Working Group to the President of the General Assembly, UN Doc. A/66/119, 30 June 2011, Annex para. 1(a).

Lodge, M. 'Protecting the marine environment of the deep seabed' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015).

Lodge, M. 'The deep seabed' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015).

Lodge, M. (2011) 'Some legal and policy considerations relating to the establishment of a representative network of protected areas in the Clarion-Clipperton Zone,' *International Journal on Marine and Coastal Law*, Vol. 26.

Lodge, M.; Johnson, D.; Le Gurun, G.; Wngler, M.; Weaver, P.; Gunn, V. (2014) 'Seabed mining: International Seabed Authority environmental management plan for the Clarion–Clipperton Zone: a partnership approach,' *Marine Policy*, Vol. 29.

Lomas, M.; Bates, N.; Buck, K.; Knap, A. (eds.) (2011) *Oceanography of the Sargasso Sea: Overview of Scientific Studies*. Washington, DC: Sargasso Sea Alliance.

Long, R. 'North-East Atlantic and the North Sea' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015).

Long, R. 'Principles and normative trends in European Union ocean governance' in C. Schofield, S. Lee, M. Kwon (eds.), *The Limits Of Maritime Jurisdiction* (Boston/Leiden: Brill/Nijhoff Publishers, 2014).

Long, R. 'The Anthropocene, autopoiesis and the disingenuousness of the genuine link: Addressing enforcement gaps in the legal regime for areas beyond national jurisdiction' (Commentary on Rosemary Rayfuse) in A. Oude Elferink, E. J. Molenaar (eds.), *The international legal regime of areas beyond national jurisdiction: Current and future developments* (The Hague: Martinus Nijhoff, 2009).

Long, R. (2006) 'Review of the legal framework applicable to marine protected areas as a tool for ecosystem conservation and fisheries management.' Copenhagen: DIFRES.

Long, R. *Marine Resource Law* (Dublin: Thomas Round Hall, 2007).

Long, R. (2016) 'Opportunity for paradigm change: Establishing a normative basis for marine ecological restoration in ABNJ,' *Stress testing the Law of the Sea: Dispute resolution, disasters and new challenges*. London: Kings College/LOSI Berkeley, 1 October 2016.

Long, R.; Grehan, A. (2002) 'Marine habitat protection in sea areas under the jurisdiction of a coastal member state of the European Union: the case of deep-water coral conservation in Ireland,' *The International Journal of Marine and Coastal Law*, Vol. 17(2

Long, R.; Rodriguez Chaves, M. (2016) 'Anatomy of a new international instrument for biodiversity beyond national jurisdiction: First impressions of the preparatory process,' *Environmental Liability: Law, Policy and Practice Journal*, Vol. 25(2).

Lowe, V. *International Law: A Very Short Introduction* (Oxford: Oxford University Press, 2007).

Luckhurst, B.; Arocha, F. (2015) *Evidence of spawning in the southern Sargasso Sea of fish species managed by ICCAT albacore tuna, swordfish and white marlin*. Bermuda: ICAAT.

Luschi, P. (2003) 'A review of long-distance movements by marine turtles and the possible role of ocean currents,' *OIKOS*, Vol. 103.

Lyster, S. (1989) 'The Convention on the Conservation of Migratory Species of Wild Animals', *Natural Resources Journal*, Vol. 29.

Marika, C.; Fagnani, S.; Swan, J.; Tamada, K.; Watanabe, H. (2012) *Performance reviews by Regional Fishery Bodies: Introduction, summaries, synthesis and best practices*. Rome: FAO. Fisheries and Aquaculture Circular Volume I (No. 1072).

Marine Resources Assessment Group Ltd (2005) *IUU fishing on the high seas: Impacts on Ecosystems and Future Science Needs*. London: Marine Resources Assessment Group Ltd.

McDonald, E. (1948) 'Toward a World Maritime Organisation: A half-century of developments in ocean shipping,' *Department of State Bulletin*, Vol. 1.

McDougal, M.; Burke, W. T. *The Public Order of the Oceans*: *A Contemporary International Law of the Sea* (New Haven: New Haven Press/Martinus Nijhoff, 1962, 1985, 1987).

McGrath, C. 'The role played by policy objectives in environmental law,' in D. Fisher (ed.) *Research Handbook on fundamental concepts of Environmental Law* (Cheltenham, UK: Edward Elgar Publishing, 2016).

Meere, F.; Geen, G.; Hanich, Q.; Lack, M.; Sant, G.; Tsamenyi, M. (2008) 'CITES introduction from the sea, a practical way forward,' *TRAFFIC Bulletin* Vol. 21(3).

Mengerink, K.; Van Dover, C.; Ardron, J.; Baker, M.; Escobar-Briones, E.; Gjerde, K.; Koslow, J. A.; Ramirez-Llodra, E.; Lara-Lopez, A.; Squire, D.; Sutton, T.; Sutton, T.; Levin, L. (2014) 'A call for deep-ocean stewardship,' *Science*, Vol. 344.

Molenar, E.; Oude Elferink, A. (2009) 'Marine Protected Areas in areas beyond national jurisdiction: The pioneering efforts under the OSPAR Convention,' *Utrecht Law Review*, Vol. 5(1).

Mooney-Seus, A. Rosenberg, *Best practices for high seas fisheries management: Lessons learned* (London: Royal Institute of International Affairs, 2007).

Moore, G. 'The Code of Conduct for Responsible Fisheries', in E. Hey (ed.), *Developments in International Fisheries Law* (The Netherlands: Brill-Nijhoff, 1999).

Morgera, E. (2004) 'Whale Sanctuaries: An evolving concept within the International Whaling Commission,' *Ocean Development and International Law*, Vol. 35.

Mossop, J. 'Reconciling activities on the extended continental shelf with protection of the marine environment' in R. Rayfuse (ed.), *Research Handbook on Marine Environmental Law* (Cheltenham: Edward Elgar, 2015).

Mossop, J. (2007) 'Protecting biodiversity on the continental shelf beyond 200 nautical miles,' *Ocean Development and International Law,* Vol. 38.

Mossop, J. *The Continental Shelf Beyond 200 Nautical Miles. Rights and Responsibilities* (Oxford: Oxford University Press, 2017).

Mrosovsky, N.; Ryan, G.; James, M. (2009) 'Leatherback turtles: The menace of plastic,' *Marine Pollution Bulletin*, Vol. 58(2).

NAFO. Conservation and Enforcement Measures 2015. FC Doc. 15/1.

NAFO. Conservation and Enforcement Measures 2017. FC Doc. 17-01.

NAFO. Scientific Council Meeting. 23-27 September 2013, 311.

National University of Singapore Centre for International Law (2017) 'New Activity: Geoengineering,' *International Conference on High Seas Governance: Gaps and Challenges*. Singapore, 24-25 April, 12-13.

NEAFC and OSPAR Commission (2015) *The Process of Forming a Cooperative Mechanism Between NEAFC and OSPAR*. London: OSPAR.

Norbartolo di Sciara, G.; Hyrenbach, D.; Agardy, T. (2008) 'The Pelagos sanctuary for Mediterranean marine mammals case study,' *Lessons in Conservation*, Vol. 2.

Norbartolo di Sciara, G.; Hyrenbach, D.; Agardy, T., Scovazzi, T.; Van Klaveren, P. (2007) 'The Pelagos Sanctuary for Mediterranean marine mammals,' *Aquatic Conservation: Marine and Freshwater Ecosystems*, Vol. 18.

Nordquis, M. H.; Nandan, S; Shabtai, R. (eds.), Unite*d Nations Convention on the Law of the Sea 1982 – A Commentary* (The Hague: Martinus Nijhoff Publishers, 1995) Volume III.

Nordquist, M.; Nandan, S.; Rosenne, S. (eds.), *United Nations Convention on the Law of the Sea 1982: A Commentary*, Vols. 1-7, (Leiden/Boston: Brill, 1986-2011).

Notarbartolo di Sciara, G. (2009) *The Pelagos Sanctuary for the conservation of Mediterranean marine mammals: An iconic high seas MPA in dire straits*. Italy: Tethys Research Institute.

O'Leary, B. C.; Brown, R. L.; Jonhson, D.; Callum, R. (2012) 'The first network of marine protected areas in the high seas: The process, the challenges and where next,' *Marine Policy*, Vol. 36.

O'Leary, B.; Marit Winther-Janson, M.; Bainbridge, J.; Aitken, J.; Hawkins, J.; Roberts, C. (2016) 'Effective coverage targets for ocean protection,' *Conservation Letters*, Vol. 5.

Oka, A.; Tajika, E.; Abe-Ouchi, A.; Kubota, K. (2011) 'Role of the ocean in controlling atmospheric CO2 concentration in the course of global glaciations,' *Climate Dynamics*, Vol. 37.

Olsen, E. *Achieving ecologically coherent MPA networks in Europe: Science needs and priorities* (Ostend: European Marine Board, 2013).

Oral, N. 'Forty years of the UNEP Regional Seas Programme: From past to future' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015).

Oral, N. *Regional cooperation and protection of the marine environment under international law: The Black Sea* (The Netherlands: Koninklijke Brill NV, 2013).

Organización Latinoamericana de Desarrollo Pesquero (2011) *Evaluación de las estrategias aplicadas por los países de la Región para la lucha contra la pesca ilegal, no declarada y no reglamentada*. Peru: OLDEPESCA.

Ortíz Wolford, J.; Cabrera Arreola, A.; Corona Figueroa, M.; Gudiel Coron, V. M. (2012) *Cetáceos del Pacífico oeste de Guatemala, y su importancia en el desarrollo socio-económico y ambiental del Pacífico Guatemalteco*. Guatemala: Centro de Estudios Conservacionistas, Universidad de San Carlos de Guatemala.

OSPAR Commission (2010) *Quality Status Report 2010*. London: OSPAR.

OSPAR Commission (2014) *Status Report on the OSPAR Network of Marine Protected Areas*. London: OSPAR.

OSPAR Commission (2015) *Annual Report 2014/2015*. London: OSPAR.

OSPAR Commission (2015) *Status Report on the OSPAR network of marine protected areas*. London: OSPAR.

OSPAR Commission. Agreement 2003/18. Guidelines for the management of MPAs in the OSPAR maritime area.

OSPAR Commission. Agreement 2008/1. Code of Conduct for Responsible Marine Research in the Deep-Seas and High Seas of the OSPAR Maritime Area.

OSPAR Commission. Agreement 2008/6.

OSPAR Commission. Agreement 2013-02-Rules of Procedure.

OSPAR Commission. Agreement 2014/09. Collective Arrangement between competent international organisations on cooperation and coordination regarding selected areas in ABNJ in the North-East Atlantic.

OSPAR Commission. Recommendation 2003/17. Guidelines for the Identification and selection of MPAs in the OSPAR Maritime Area, Appendix I.

OSPAR Commission. Recommendation 2003/3 amended by Recommendation 2010/2.

OSPAR Commission. Recommendation 2010/5. Assessments of environmental impacts in relation to threatened and/ or declining species and habitats.

OSPAR Commission. Statement on the Ecosystem Approach to the Management of Human Activities. First joint Ministerial meeting of the Helsinki and OSPAR Commissions. Bremen, Germany. June, 2003.

Oude Elferink, A. G. (2007) 'The regime of the area: delineating the scope of application of the common heritage principle and freedom of the high seas,' *International Journal of Marine and Coastal. Law*, Vol. 22.

Oude Elferink, A. 'MPAs adjacent to or adjoining areas under national jurisdiction: Legal and practical challenges.' Unpublished paper presented at the *Workshop on an ILBI on ABNJ, Government of Portugal and the High Seas Alliance*. Lisbon, 2-3 March 2017.

Panigada, S.; Pesante, G., Zanardelli, M.; Capoulade, F.; Gannier, A.; Weinrich, M. (2006) 'Mediterranean fin whales at risk from fatal ship strikes,' *Marine Pollution Bulletin*, Vol. 52.

Papanicolopulu, I. 'The Mediterranean Sea' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015).

Parson, L.; Edwards, R. (2011) '*The Geology of the Sargasso Sea Alliance study area, potential non-living marine resources and an overview of the current territorial claims and coastal States interests*. Washington, DC: Sargasso Sea Alliance.

Parsons, T. R. (1991) 'Impact of fish harvesting on ocean ecology,' *Marine Pollution Bulletin*, Vol. 22.

Pauly, D.; R. Watson, R.; Alder, J. (2005) 'Global trends in world fisheries: Impacts on marine ecosystems and food security,' *Philosophical transactions of the Royal Society B*, Vol. 360.

Pavasovic, A; Cebrian, D.; Limam, A.; Ben Haj, S.; Garcia Charton, J.A. (2009) *Synthesis of national overviews on vulnerability and impacts of climate change on marine and coastal biological diversity in the Mediterranean region*. Tunis: UNEP-MAP RAC/SPA.

Pendleton, L.; Krowicki, F.; Strosser, P.; Hallett-Murdoch, J. (2014) *The value of marine and coastal ecosystem services in the Sargasso Sea, Working Paper EE 14*. North Carolina: Duke University.

Pennington, T.; Mahoney, K.; Kuwahara, V.; Kolber, D.; Calienes, R., Chavez, F. (2006) 'Primary productivity in the Eastern Tropical Pacific,' *Progress in Oceanography*, Vol. 69(2).

Peña, M. (2015) *The Principle of no regression of Environmental Law in Ibero-America*. Costa Rica: IUCN.

Porras, I.; Barton, D. N.; Miranda, M.; Chacón Cascante, A. *Learning from 20 years of Payments for Ecosystem Services in Costa Rica* (London: International Institute for Environment and Development, 2013).

Pörtner, O.; Karl, D. M. (2014) Ocean systems in: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. United Kingdom/United States of America: Cambridge University Press.

Post, A. M., *Deepsea Mining and the Law of the Sea* (The Hague: Nijhoff, 1983).

Proelss, A.; Houghton, K. 'Protecting marine species' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015).

RAC/SPA (2004) Strategic Action Programme for the Conservation of Biological Diversity in the Mediterranean. Tunis: UNEP-MAP-RAC/SPA.

Ratner, B.; Åsgård, B.; Allison, E. (2014) 'Fishing for justice: Human rights, development, and fisheries sector reform,' *Global Environmental Change*, Vol. 27.

Rakhyun, K. (2017) 'Should deep seabed mining be allowed?,' *Marine Policy*, Vol. 82.

Rayfuse, R. (2011) 'Differentiating the common? The responsibilities and obligations of States sponsoring deep seabed mining activities in the Area' (2011) *German Yearbook of International Law*, Vol. 54.

Reilly, S.; Thayer, V. (1990) 'Blue whale (*Balaenoptera musculus*) distribution in the Eastern Tropical Pacific,' *Marine Mammal Science* 6(4).

Reisman, W. M.; Wiessner S.; Willard, A. R. (2007) 'The New Haven School: A Brief Introduction,' *Faculty Scholarship Series*. Paper 959. See also: H. H. Koh, (2007) 'Is There a "New" New Haven School of International Law?,' *Yale J. Int'l L.*, Vol. 32.

Review Conference on the Agreement for the Implementation of the provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks. Report of the Review Conference, 136, U.N. Doc. A/CONF.210/2006/15, July 3 2006.

Rhein, M.; Aoki, S.; Campos, E.; Chambers, D.; Feely, R. A.; Gulev, S.; Johnson, G. C.; Josey, S. A.; Kostianoy, A.; Mauritzen, C.; Roemmich, D.; Talley, L. D.; Wang, F. (2013) 'Observations: Ocean,' in: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. United Kingdom/USA: Cambridge University Press.

Richardson W. J.; Greene, C. R.; Malme C. I.; Thomson, D. H. (eds.), *Marine Mammals and Noise* (San Diego, California: Academic Press, 1995).

Ringbom, H.; Henriksen T. (2017) *Governance challenges, gaps and management opportunities in Areas Beyond National Jurisdiction*. Washington: Global Environment Facility.

Roach, A. (2014) 'Today's Customary International Law of the Sea,' *Ocean Development and International Law*, Vol. 45(3).

Roberts, J. (2011) *Maritime traffic in the Sargasso Sea: An analysis of international shipping activities and their potential environmental Impacts*. Hampshire, UK: Sargasso Sea Alliance.

Rochette, J.; Unger, S.; Herr, D.; Jihnson, D.; Nakamura, T.; Packeiser, T.; Proelss, A.; Visbeck, M.; Wright, A.; Cebrian, D.(2014) 'The Regional Approach to the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction,' *Marine Policy* Vol. 49.

Rochette, J.; Wright, G.; Gjerde, K.; Greiber, T.; Unger, S.; Spadone, A. (2015) *A new chapter for the high seas? Historic decision to negotiate an international legally-binding instrument on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction*. Paris: IDDRI (Issue Brief 2/15).

Rodgers, A.; Woodall, L.; Stewart, C. (2017) *Function of the high seas and anthropogenic impacts***:** *Science update 2012 – 2017*. Oxford: Oxford University.

Rodriguez, J.; Fischel, A. (2007) *Impacto socioeconómico del turismo de observación de cetáceos en Costa Rica (Periodo 2006/2007)*. Costa Rica: Fundación PROMAR.

Roe, J.H.; Morreale, S.J.; Paladino, FV, Shillinger, G.L.; Benson, S.R.; Eckert, S.A.; Bailey, H.; Tomillo, P.S.; Bograd, S.J.; Eguchi, T.; Dutton, P.H.; Seminoff, J.A.; Block, B.A.; Spotila, J.R. (2014) 'Predicting bycatch hotspots for endangered leatherback turtles on longlines in the Pacific Ocean,' *Proceedings of the Royal Society Biological Sciences*.

Rogers, A. D.; Laffoley, D. A. (2011) *International Earth system expert Workshop on ocean stresses and impacts. Summary Report*. Oxford: IPSO.

Rogers, A.; Woodall, L. (2017) *Function of the high seas, a growing understanding. A synthesis of significant, published marine findings since 2012*. United Kingdom: Oxford University.

Rothwell, D.; Oude Elferink, A.; Scott, K.; Stephens, T. *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015).

Rothwell, D.; Stephens, T. *The International Law of the Sea*, 2 ed., (Oxford and Portland Oregon: Hart Publishing, 2016).

Ruckelshaus, M.; Klinger, T.; Knowlton, N.; de Master, D. (2008) 'Marine ecosystem-based management in practice: Scientific and governance challenges,' *BioScience*, Vol. 58.

Ruwa, R.; Simconck, A. (2017) *Technical abstract of the first global integrated marine assessment on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*. New York: United Nations.

Salas, E.; Ross, E.; Arias, A. (eds.), *Diagnóstico de áreas marinas protegidas y áreas marinas para la pesca responsable en el Pacífico costarricense* (Costa Rica: Fundación MarViva, 2012).

Salas, S., Chuenpagdee, R.; Charles, A.; Seijo, J. C. (eds.), 'Coastal fisheries of Latin America and the Caribbean,' *FAO Fisheries and Aquaculture Technical Paper*. No. 544. Rome, FAO. 2011.

Sand, P. H. (1987) 'The rise of regional Agreements for marine environment protection,' *The Law and the Sea: Essays in memory of Jean Carroz*.

Sands, P.; Peel, J. *Principles of International Environmental Law* (Cambridge: Cambridge University Press, 2012) 3rd ed.

Sands, P.; Peel, J. *Principles of International Environmental Law* (United Kingdom: Cambridge University Press, 2012).

Sargasso Sea Commission (2016) *Lessons from the Sargasso Sea: Challenges to the conservation and sustainable use of biodiversity beyond national jurisdiction*. Washington, DC: Sargasso Sea Commission.

Sargasso Sea Commission (2017) *Sargasso Sea Stewardship Plan, Executive Summary*. Washington, DC: Sargasso Sea Commission.

Schwartz, F. (1988) 'Aggregations of young hatchling loggerhead sea turtles in the Sargassum off North Carolina,' *Marine Turtle News*, Vol. 42(9).

Scott, K. 'Integrated Oceans Management: A new frontier in marine environmental protection,' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015).

Scovazzi, T. 'The deep seabed. Legal and political challenge,' in H. Smith, J. Suárez de Vivero, T. Agardy (eds.), *Routledge Handbook of ocean resources and management* (New York: Routledge, 2015).

Scovazzi, T. (1998) 'The enforcement in the Mediterranean of United Nations resolutions on large-scale driftnet fishing,' in J. A. Frowein and R. Wolfrum (eds.), *Max Planck Yearbook of United Nations Law*, Vol. 2.

Scovazzi, T. (2004) 'Marine Protected Areas on the high seas: Some legal and policy considerations,' *International Journal of Marine and Coastal Law* Vol. 19(1).

Scovazzi, T. (2009) 'The Mediterranean Guidelines for the determination of environmental liability and compensation: The negotiations for the instrument and the question of damage that can be compensated,' in A. von Bogdandy and R. Wolfrum (eds.), *Max Planck Yearbook of United Nations Law,* Vol. 13.

Scovazzi, T. (ed.) (2011) *Note on the establishment of marine protected areas beyond national jurisdiction or in areas where the limits of national sovereignty or jurisdiction have not yet been defined in the Mediterranean Sea*. Tunis: UNEP-MAP-RAC/SPA.

Sea Education Association (2015) *A marine management proposal for the Sargasso Sea*. Massachusetts, USA: Sea Education Association.

Seascape Consultants (2014) *Review of implementation of the Environmental Management Plan for the Clarion-Clipperton Zone. Report to the International Seabed Authority*. Kingston: ISA.

Secretary General Report to the Economic and Social Council, Document E/2016/75, 5 July 2016.

Seta¨la¨, O.; Fleming-Lehtinen, C.; Lehtiniemi, M. (2014) 'Ingestion and transfer of microplastics in the planktonic food web,' *Environ. Pollut.,* Vol. 185.

Shang-Ping, X.; Haiming, X.; Kessler, W.; Nonaka, M. (2005) 'Air–Sea Interaction over the Eastern Pacific Warm Pool: Gap Winds, Thermocline Dome, and Atmospheric Convection,' *Journal of Climate,* Vol. 18(1).

Shillinger, G., Swithenbank, A.; Bograd, S.; Bailey, H.; Spotila, J.; Piedra, R. (2010) 'Identification of high-use interesting habitats for Eastern Pacific leatherback turtles: role of the environment and implications for conservation,' *Endangered Species Research*, Vol. 10.

Sielen, A. (2009) 'The new international rules on ocean dumping: Promise and performance,' *Geo International Environmental Law Review*, Vol. 21.

Sistema Nacional de Áreas de Conservación (2014) *Estado de la Conservación de la Biodiversidad en Costa Rica: Primer Informe Técnico del Programa de Monitoreo Ecológico de las Áreas Protegidas y Corredores Biológicos de Costa Rica*. Costa Rica: SINAC-PROMEC.

Soons, A. (1977) 'The International Legal Regime for MSR,' *Netherlands International Law Review*, Vol. 24.

Soto Jiménez, M.; Yong, M.; Chacón, Aa; Gutiérrez, C.; Fernández, L.; Lücke, R.; Rojas, F.; González, G. (2010) *Un análisis de la contribución económica de la pesca deportiva y comercial a la economía de Costa Rica*. Costa Rica: Universidad de Costa Rica.

Southwick, R.; Russell, N.; Lachman, R. (2013) *Sport-fishing in Panama: Size, Economic Impacts and Market Potential*. United States of America: The Billfish Foundation.

Spear, L.; Ainley, D.; Ribic, C. (1995) 'Incidence of plastic in seabirds from the Tropical Pacific, 1984–1991: Relation with distribution of species, sex, age, season, year and body weight,' *Marine Environmental Research*, Vol. 40(2).

Spijkers, O.; Elferink, A. O. (2016) 'Potential for a new CMS Agreement on the European eel,' *First Range State Workshop on the European Eel*. Galway, Ireland: UNEP/CMS.

Spotila, J. R. (2000) 'Pacific leatherback turtles face extinction,' *Nature*, Vol. 405.

Stephens, T. 'Ocean acidification' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing. 2015).

Stevenson, A. (2011) *Humpback Whale Research Project, Bermuda*. Washington, DC: Sargasso Sea Alliance.

Suárez, M.; Gasca, S. R. (1989) 'Epiplanktonic calanoid copepods from the Costa Rica Dome (July- August, 1982),' *Ciencias Marinas*, Vol. 15(1).

Sumaila, U.; Vats, V.; Swartz, W. (2013) *Values from the resources of the Sargasso Sea*. Washington, DC: Sargasso Sea Alliance.

Summer, M.; Ballance, L.; Groves, T. (2016) 'An ecosystem services perspective for the oceanic Eastern Tropical Pacific: Commercial fisheries, carbon storage, recreational fishing, and biodiversity,' *Frontiers in Marine Science*, Vol. 3.

Swedish National Board of Fisheries (1995) *Technical consultation on the precautionary approach to capture fisheries and species introductions*, Rome: FAO.

Takei, Y. *Filling Regulatory Gaps in High Seas Fisheries: Discrete High Seas Fish Stocks, Deep-sea Fisheries and Vulnerable Marine Ecosystems* (Leiden: Nijhoff, 2013).

Tan, A. *Vessel Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge: Cambridge University Press, 2006).

Tanaka, Y. (2009) 'Reflections on reporting systems in Treaties concerning the protection of the marine environment,' *Ocean Development and International Law*, Vol. 40.

Tanaka, Y. (2012) 'Reflections on High Seas marine protected Areas: A comparative analysis of the Mediterranean and the North-East Atlantic Models, *Nordic Journal of International Law*, Vol. 81.

Tanaka, Y. *A Dual Approach to Ocean Governance: The cases of the zonal and integrated management in international law of the sea* (Farnham: Ashgate, 2008).

Tanaka, Y. *The International Law of the Sea,* 2 ed., (Cambridge: CUP, 2015).

The Royal Society (2017) *Future ocean resources: Metal-rich minerals and genetics – evidence pack.* United Kingdom: The Royal Society.

Tladi, D. 'Ocean Governance: A fragmented regulatory regime' in P. Jacquest, R.K. Pachauri, L. Tubiana (eds.), *Oceans: The New Frontier* (TERI Press: Delhi, 2011).

Tournadre, J. (2014) 'Anthropogenic pressure on the open ocean: The growth of ship traffic revealed by altimeter data analysis,' *Geophysical Research Letters*, Vol. 41(22).

Troëng, S.; Drews, C. (2004) *Money Talks: Economic Aspects of Marine Turtle Use and Conservation*, WWF - International, Gland, Switzerland.

Trutanich, P. (2005) 'Eastern Tropical Pacific tuna fisheries,' *INFOFISH International*, Vol. (4).

Turner, J. (2016) *Antarctic climate change and the environment 2016 update.* Chile: Antarctic Treaty Consultative Meeting.

Turner, J.; Barrand, N.; Bracegirdle, T.; Convey, P.; Hodgson, D. A.; Jarvis, M.; Jenkins, A.; Marshall, G.; Meredith, M.; Roscoe, H.; Shanklin, J.; French, J.; Goosse, H.; Guglielmin, M.; Gutt, J.; Jacobs, S.; Kennicutt, M.; Masson-Delmotte, V.; Mayewski, P.; Navarro, F.; Robinson, S.; Scambos, T.; Sparrow, M.; Summerhayes, C.; Speer, K.; Klepikov, A. (2014) 'Antarctic climate change and the environment: An update,' 50 *Polar Record*, Vol. 50.

UN Doc. 64 A/59/62/Add.1.

UN Doc. A/42/521-S/19085, 31 August 1987.

UN Doc. A/66/70/Add.1, 11 April 2011.

UN Doc. A/CONF.199/20, 4 September 2002.

UN Doc. A/RES/66/288, 11 September 2012.

UN Doc. UNEP/CBD/COP/DEC/X/1, 12 October 2014.

UN Doc. UNEP/CBD/COP/10/27 Annex.

UNEP (1975) *Report on the Intergovernmental meeting on the protection of the Mediterranean*. Barcelona: UNEP/WG.2/5. Annex.

UNEP (1995) Report of the 9th ordinary meeting of Contracting Parties to the Barcelona Convention. Athens: UNEP(OCA)/MED IG.5/16.

UNEP (1997) *Report on the 1st meeting of Government-designated legal and technical experts on the preparation of appropriate rules and procedures for the determination of*

liability and compensation for damage resulting from pollution of the marine environment in the Mediterranean Sea area. Athens: UNEP.

UNEP (2009) *Regional Working Programme for the Coastal and Marine Protected Areas in the Mediterranean Sea including the High Seas*. Tunis: UNEP-MAP RAC/SPA.

UNEP (2010) *Latin America and the Caribbean Environment Outlook: GEO LAC 3*. UNEP, Panama.

UNEP/CMS/COP11/Doc.24.1.18 Rev.1, 12 September 2014.

UNEP/CMS/StC42/Doc.6.1 . Cooperation between CMS and CITES.

UNEP/CMS/StC44/4.1. 3.

UNEP/EC (2015) 'Cooperation between UNEP MAP-Barcelona Convention and FAO-GFCM,' *Workshop on regional ocean governance*. Belgium, 9–10 November.

UNESCO (2017) *Global Ocean Science Report: The Current Status of Ocean Science around the World – Executive Summary*. Paris: UNESCO.

UNESCO. Global Strategy for a representative, balanced and credible World Heritage List. (1994-2004).

UNESCO. Intergovernmental Committee for the protection of the World Cultural and Natural Heritage. Operational Guidelines for the Implementation of the World Heritage Convention. 2012.

Unger, S. (2016) 'Partnership for Regional Ocean Governance and its support for the regional seas programmes in relation to ABNJ. Regional Seas Programmes and Biodiversity in ABNJ.' *Side event at the Second Session of the BBNJ Preparatory Committee*. United Nations Headquarters, New York, 6 September.

United Nations Division for Ocean Affairs and the Law of the Sea (1996) 'Competent or relevant International Organisations under the United Nations Convention on the Law of the Sea', *Law of the Sea Bulletin*, Vol. 31.

United Nations Division for Ocean Affairs and the Law of the Sea (2010) *Marine Scientific Research: A revised guide to the implementation of the relevant provisions of the United Nations Convention on the Law of the Sea*. New York: United Nations.

United Nations Division for Ocean Affairs and the Law of the Sea (ed.) (2017) *The First Global Integrated Marine Assessment: World Ocean Assessment I. Chapter 36. The Southern Ocean*. Cambridge: Cambridge University Press.

Unpublished Report of the International Conference on High Seas Governance Gaps and Challenges, 24-25 NUS Centre for International Law, Singapore.

Van Dover, C. (2011) 'Tighten regulations on deep-sea mining,' *Nature*, Vol. 470.

Van Dover, C.; Aronson, J.; Pendleton, L.; Smith, S.; Arnaud-Haond, S.; Moreno Mateos, D.; Barbier, E.; Billet, D.; Bowers, K.; Danovaro, R.; Edwards, A.; Kellert, S.;

Morato, T.; Pollard, E.; Rogers, A.; Warner, R. (2014) 'Ecological restoration in the deep sea: Desiderata,' *Marine Policy*, Vol. 44.

Verlaan, P. 'Marine Scientific Research: Its potential contribution to achieving responsible High Seas Governance,' *The International Journal of Marine and Coastal Law*, Vol. 27(4) (2012).

Verne, J. *Twenty thousand leagues under the seas: An underwater tour of the world* (France: Pierre-Jules Hetzel, 1870).

Victor, D.; Raustiala, K.; Skolnikoff, E. (eds.), *The implementation and effectiveness of international environmental commitments: Theory and practice*. (Cambridge: MIT Press, 1998).

Vierros, M.; Jiménez, J. A.; Shillinger, G.; Hoyt, E. (2014) *Protection and management of the Costa Rica Dome: An oceanic oasis for marine conservation and sustainable fisheries*. Costa Rica, MarViva Foundation.

Vierros, M.; Suttle, C.; Harden-Davies, H.; Burton, G. (2016) 'Who owns the ocean? Policy issues surrounding marine genetic resources,' *Limnology and Oceanography Bulletin*. Vol. 29.

Vigni, P. 'Antarctic Maritime Claims: Frozen Sovereignty and the Law of the Sea' in A. Oude Elferink, E. Rothwell (eds.), *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction* (Martinus Nijoff: The Hague, 2001).

Vilchis, I. (2010) *A retrospective study of ecosystem effects of the 1976/77 regime shift in the Eastern Pacific warm pool*. Unpublished Oceanography PhD thesis. University of California, San Diego.

Von Nordheim, H.; Packeiser, T. (2011) ' Designation and management of OSPAR MPAs beyond national jurisdiction in the North-East Atlantic,' *IUCN Seminar on the conservation and sustainable use of marine biodiversity beyond national jurisdiction*. Bonn, Germany, 3–6 December.

Vousden, D. 'Large marine ecosystems and associated new approaches to regional, transboundary and high seas management' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing. 2015).

Waluda, C.; Rodhouse, P. (2006) 'Remotely sensed mesoscale oceanography of the Central Eastern Pacific and recruitment variability in *Dosidicus gigas,' Marine Ecology Progress Series* Vol. 310.

Warner, R. 'Conserving marine biodiversity in areas beyond national jurisdiction: Co-evolution and interaction with the Law of the Sea' in D. Rothwell, A. Oude Elferink, K. Scott, T. Stephens, *The Oxford Handbook of the Law of the Sea* (Oxford: OUP, 2015).

Warner, R. 'Environmental assessment in marine areas beyond national jurisdiction' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law* (Cheltenham, UK: Edward Elgar Publishing, 2015).

Warner, R. 'Marine Biodersity in Areas Beyond National Jurisdiction' in D. Rothwell et. al., *Oxford Handbook of International Law* (Oxford: Oxford University Press, 2015).

Warner, R. (2017) 'The connected legal seascape of areas within and beyond national jurisdictions,' *Side event at the Third Session of the BBNJ Preparatory Committee*. March 26 – April 7, United Nations Headquarters.

WHC-11/35.COM/INF.9A. Paris, 27 May 2011.

White, C.; Costello, C. (2014) 'Close the high seas to fishing?,' *PLoS Biology*, Vol. 12.

Whitmash, D. *Economic management of marine living resources: a practical introduction* (London: Earthscan, 2011).

Willis-Norton, E.; Hazen, E.; Fossette, S.; Shillinger, G.; Rykaczewski, R.; Foley, D.; Dunne, J.; Bograd, S. (2014) 'Climate change impacts on leatherback turtle pelagic habitat in the Southeast Pacific,' Deep-Sea Research II Topical Studies in Oceanography.

Wolfrum, R. (1983) *The principle of the common heritage of mankind*. Munich: Max Planck Institute for Foreign Public Law and International Law.

World Bank. 2017. *The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries*. Washington, DC: World Bank. Environment and Sustainable Development series.

Wright, G; Rochette, J.; Druel, E. 'Marine protected areas in areas beyond national jurisdiction' in R. Rayfuse (ed.), *Research Handbook on International Marine Environmental Law*. (Cheltenham, UK: Edward Elgar Publishing, 2015).

Wright, G., Schmidt, S., Rochette, J., Shackeroff, J., Unger, S., Waweru, Y., Müller, A. (2017) *Partnering for a Sustainable Ocean: The Role of Regional Ocean Governance in Implementing SDG14*. PROG: IDDRI, IASS, TMG, UN Environment.

Wright, G.; Rochette, J.; Druel, E.; Gjerde, K. (2015) *The long and winding road continues: towards a new agreement on high seas governance*. Paris: IDDRI. (Study No. 01/16).

Written submission of the EU and its Member States. SN 3757/16, 25 July 2016. Preparatory Committee for the development of an international legally binding instrument under the United Nations Convention on the Law of the Sea (UNCLOS) on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction.

Wyrtki, K. (1964) 'Upwelling in the Costa Rica Dome,' *Fishery Bulletin*, Vol. 63(2).

Zacharias, M.; Gerber, L.; Hyrenbach, K. (2006) 'Review of the Southern Ocean Sanctuary: Marine Protected Areas in the context of the International Whaling Commission Sanctuary Programme.' *J. CETACEAN RES. MANAGE, Vol.* 8(1).

INTERNATIONAL CONVENTIONS AND PROTOCOLS

1958 High Seas Convention. 450 UNTS 11. Entered into force 30 September 1962.

1959 Antarctic Treaty. 402 UNTS 71. Entered into force 23 June 1961.

1994 Agreement Relating to the Implementation of Part XI of the UNCLOS of 10 December 1982. 1836 UNTS 42. Entered into force July 28 1996.

Abidjan Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region. 1316 UNTS 205. Entered into force 5 August 1984.

Barcelona Convention. Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean.

Barcelona Convention. Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft.

Barcelona Convention. Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-based Sources and Activities.

Barcelona Convention. Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal.

Barcelona Convention. Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil.

Barcelona Convention. Protocol on Integrated Coastal Zone Management in the Mediterranean.

Central American Convention on Climate Change. Signed 29 October 1993.

Code of Conduct for Responsible Fisheries. Adopted 31 October 1995.
Convention Concerning the Protection of the World Cultural and Natural Heritage. 1037 UNTS 151. Entered into force 17 December 1975.

Convention Establishing the Central American Commission on Environment and Development. Signed 12 December 1989.

Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific. Adopted 18 February 2002.

Convention for the Conservation of the Biodiversity and the Protection of Wilderness Areas in Central America. Entered into force 20 December 1994.

Convention for the Establishment of the Inter-American Tropical Tuna Commission. 80 UNTS 3. Entered into force 3 March 1950.

Convention for the Prevention of Pollution from Ships. 1340 UNTS 184. Adopted 2 November 1973.

Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. 1506 UNTS 157. Entered into force 11 October 1986.

Convention for the Protection of the Marine Environment of the North-East Atlantic. 2354 UNTS 67. Entered into force 25 March 1998.

Convention on Biological Diversity. 1760 UNTS 79. Entered into force 29 December 1993.

Convention on Environmental Impact Assessment in a Trans-boundary Context 1989. UNTS 310. Entered into force 10 September 1997 and complementary Protocol on Strategic Environmental Assessment. 2685 UNTS. Entered into force 11 July 2010.

Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries. 1135 UNTS 369. Entered into force 1 January 1979.

Convention on International Trade in Endangered Species of Wild Flora and Fauna. 993 UNTS 243. Entered into force 1 July 1975.

Convention on Migratory Species. 1651 UNTS 333. Entered into force 1 November 1983.

Convention on the conservation of Antarctic marine living resources. UNTS 1329. Entered into force 7 April 1982.

Convention on the Prevention of Marine Pollution by Dumping of Wastes and other matter. 1046 UNTS 120. Entered into force 30 August 1975.

Convention on the Protection of the Mediterranean Sea against Pollution. 1102 UNTS 27. Entered into force 12 February 1978.

Convention on the Protection of the Underwater Cultural Heritage. 2562 UNTS 3. Entered into force 2 January 2009.

FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas. 2221 UNTS 91. Entered into force 24 April 2003.

Formalization of the Organisation for Fisheries and Aquaculture Sector of the Central American Isthmus (OSPESCA). San Salvador Act. Entered into force 18 December 1995.

Hamilton Declaration. Adopted in Bermuda 11 March 2014.

Inter-American Convention for the Protection and Conservation of Sea Turtles. 2164 UNTS 31. Entered into force 2 May 2001.

International Agreement on the Creation of a Marine Mammal Sanctuary. 2176 UNTS 247. Entered into force 21 February 2002.

International Convention for the Conservation of Atlantic Tunas. 673 UNTS 63. Entered into force 21 March 1969.

International Convention for the Regulation of Whaling. 161 UNTS 72. Entered into force 10 November 1948.

International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties. UNTS 970. Entered into force 6 May 1975.

International Treaty on Plant Genetic Resources for Food and Agriculture. 2400 UNTS 303. Entered into force 29 June 2004.

Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their Utilization to the Convention on Biological Diversity, UN Doc. UNEP/CBD/COP/DEC/X1. Entered into force 12 October 2014.

Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol). 30 ILM 1455. Entered into force 14 January 1998.

Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other than Oil. UNTS 1313. Entered into force 30 March 1983.

Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. 36 ILM 1. Entered into force 24 March 2006.

Special Agreement of the Ministers responsible for Maritime Transportation in Central America. COCATRAM Statutes. Entered into force 11 July 1991.
Tegucigalpa Protocol to the Charter of the Organisation of Central American States. 1695 UNTS 382. Entered into force 23 July 1992.

United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. 2167 UNTS 88. Entered into force 11 December 2001.

United Nations on the Law of the Sea. 1833 UNTS. 3/21 ILM 1261 (1982). Entered into force 16 November 1994.

RESOLUTIONS

Antarctic Treaty Resolution 6 (2013).
Antarctic Treaty Resolution 7 (2005).
Antarctic Treaty Resolution 9 (2009).
Antarctic Treaty. Resolution 1 (2016).
CCAMLR Resolution 15/XXII (2003).
CCAMLR Resolution 30/XXVIII (2009).
CCAMLR. Resolution 31/XXVIII (2009).
CMS. UNEP/CMS/Resolution 10.24, 20-25 November 2011.
CMS. UNEP/CMS/Resolution 9.19, 1-5 December 2008.
COMITRAN. Resolution 01-2014, 11 November 2014.
FAO Resolution 4/61 (1973), amended by Resolution 3/74 (1978), and Resolution 1/131 (2006).
FAO Resolution 18/97, 17 November 1997.
IATTC Resolution A-04-08, 20 October 2004.

IATTC Resolution C-00-06, 15 June 2000.
IATTC Resolution C-04-07, 14 June 2004.
IATTC Resolution C-05-03, 24 June 2005.
IATTC Resolution C-11-08, 8 July 2011.
IATTC Resolution C-14-02, 18 July 2014.
IATTC Resolution C-14-03, 18 July 2014.
IATTC Resolution C-15-01, 3 July 2015.
IATTC Resolution C-15-04, 3 July 2015.
IATTC Resolution C-16-04, 1st July 2016.
IATTC Resolution C-16-06, 1st July 2016.
IATTC Resolution C-11-02, 8 July 2011.
IATTC Resolution C-13-01, 14 June 2013.
ICCAT Resolution 05-11 (2005).
ICCAT Resolution 12-12 (2012).
IMO Assembly Resolution A.982 (24).
IMO Assembly Resolution, 1 December 2005.
IMO Resolution A.1024(26), December 2009.
IMO Resolution A.982 (24), January 2006.
IMO Resolution A.999 (25), November 2007.
IMO Resolution LP.4 (8), October 2013.
IMO Resolution MEPC.189 (60), March 2010.
Interamerican Convention on the Protection and Conservation of Sea Turtles, Resolution CIT-COP7-2015-R3.
Meeting of Ministers responsible for the Central American economic integration. Resolution 5-80, 15 July 1980.
OSPESCA Resolution No. 10, 1st July 2015.
UNEP Resolution UNEP/EA.2/Res.11, 23 May 2016.
UNEP/CMS/Resolution 11.25, November 2014.
UNGA Resolution 61/106, 8 December 2006.
UNGA Resolution A/59/24, 4 February 2005.
UNGA Resolution A/59/62/Add.1, 18 August 2004.
UNGA Resolution A/66/189, 27 July 2011.
UNGA Resolution A/RES/56/12, 13 December 2001.
UNGA Resolution A/RES/66/288, 11 September 2012.
UNGA Resolution A/RES/67/78, December 11 2012.
UNGA Resolution A/RES/69/292, 6 July 2015.
UNGA Resolution A/RES/69/292, 6 July 2015.
UNGA Resolution A/RES/70/1, 21 October 2015.
UNGA Resolution A/RES/71/257, 20 February 2017.
UNGA Resolutions 59/25, 17 January 2005.
UNGA Resolutions 61/105, 6 March 2007.
UNGA Resolutions 64/72, 19 March 2010.
UNGA Resolutions 66/68, 28 March 2012.

DECISIONS

CBD Decision UNEP/CBD/COP/DEC/XI/17. 5, December 2012.
CBD. Decision XI/20, October 2012.
International Seabed Authority, Decision ISBA/18/C/22.
International Seabed Authority, Decision ISBA/19/C/17.
ISA Assembly Decision ISBA/16/C/WP.2.
ISA Assembly Decision ISBA/18/A/11.

ISA Assembly Decision ISBA/19/A/12.
ISA Assembly Decision ISBA/19/A/9.
ISA Council Decision ISBA/19/C/17.
ISA Assembly Decision ISBA/16/A/12/Rev.
UNEP Decision IG.17/6.
UNEP Decision IG.20/4.
UNEP Decision IG.21/3.
UNEP Decision IG.22/6.
UNEP Decision IG.22/7.
UNEP/CBD/COP/DEC/X/29.
UNEP/CBD/COP/DEC/XII/22.

JURISPRUDENCE

Certain activities carried out by Nicaragua in the border area (Costa Rica v. Nicaragua) and Construction of a road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica). Judgement, I.C.J. Reports 2015.

Definition of the minimum access conditions and exploitation of fisheries resources within the maritime zones under the jurisdiction of Sub-Regional Fisheries Commission (SRFC) Member States. Advisory Opinion. ITLOS Case No. 21, 2015.

Dispute concerning delimitation of the maritime boundary between Bangladesh and Myanmar in the Bay of Bengal (Bangladesh/Myanmar), Judgment, ITLOS Case No. 16, 14 March 2012.

Anklagemyndigheden (Public Prosecutor) v. *P.M. Poulsen and Diva Navigation*, European Court of Justice Case C-286/90, with annotation by P.J. Slot. ECJ 453.

Fisheries Jurisdiction Case (United Kingdom v. Iceland), Judgment, I.C.J. Reports 1974.

Gabčíkovo -Nagymaros Project (*Hungary v Slovakia*), Judgment, I.C.J. Reports 1997.

Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996.
MOX Plant Case (Ireland v United Kingdom), Provisional Measures Order 2001/5, ITLOS Case No. 10, 2001.
Pulp Mills on the River Uruguay (Argentina v. *Uruguay),* Judgment, I.C.J. Reports 2010.

Responsibilities and Obligations of State Sponsoring Persons and Entities with Respect to Activities in the Area, Advisory Opinion, ITLOS Seabed Disputes Chamber, Case No. 17, 2011.

South China Sea Arbitration (The Republic of Philippines v. The People's Republic of China), Permanent Court of Arbitration Case No. 2013-19 (Inter-State arbitration), 2016.

Southern Bluefin Tuna Case (New Zealand-Japan, Australia-Japan), Advisory Opinion, ITLOS Case No. 3, 2000.

Whaling in the Antarctic Case (*Australia v Japan: New Zealand intervening*), Judgment, I.C.J. Reports 2014.

WEBSITES

Addis Ababa Action Agenda of the Third International Conference on Financing for Development. Available at: http://www.un.org/esa/ffd/ffd3/wp-content/uploads/sites/2/2015/07/Addis-Ababa-Action-Agenda-Draft-Outcome-Document-7-July-2015.pdf

Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction, available at: http://www.un.org/depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm

Agreement of cooperation between the International Maritime Organisation and the OSPAR Commission for the protection of the marine environment in the North East Atlantic. Available at: http://www.ospar.org/site/assets/files/1357/imo_oneils_letter_30_nov_1999_and_attachments_from_imo.pdf

Antarctic Treaty System. *Guidelines for implementation of the framework for protected areas set forth in Article 3, Annex V of the Environmental Protocol*. Available at: https://www.ats.aq/documents/recatt/Att081_e.pdf

Appendices I and II of the Convention on the Conservation of Migratory Species of Wild Animals. Effective: 8 February 2015. Available at: http://www.cms.int/sites/default/files/document/Appendices_COP11_E_version5June2015.pdf

Arrangement between the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean and the Commission for the Conservation of Antarctic Marine Living Resources. Available at: https://www.ccamlr.org/en/system/files/WCPFC-CCAMLR%20Agreement%20%282014%29.pdf

Arrangement between the Commission for the Conservation of Southern Bluefin Tuna and the Commission for the Conservation of Antarctic Marine Living Resources. Available at: https://www.ccamlr.org/en/system/files/CCSBT.pdf

Arrangement between the South Pacific Regional Fisheries Management Organisation and the Commission for the Conservation of Antarctic Marine Living Resources. Available at: https://www.ccamlr.org/en/system/files/SPRFMO.pdf

ATLAS project factsheet. Available at: http://www.eu-atlas.org/work-package.html

ATLAS project. Available at: http://www.eu-atlas.org/work-package.html

Bay of Bengal Maritime Boundary Arbitration between Bangladesh and India. Award of 7 July 2014, para. 476. Available at: https://www.pcacases.com/web/sendAttach/383

Bosello, F.; Delpiazzo, E.; Eboli, F. (2015) 'Acidification in the Mediterranean Sea: impacts and adaptation strategies,' *Review of Environment, Energy and Economics*. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2585459##

Cabrera, E. (2014) *International Whaling Commission: Why the Whales Lost*. Centro de Conservación Cetácea. Available at: http://www.ccc-chile.org/articulo-48-1146-100614_international_whaling_commission_2014_why_the_whales_lost.html

Castellana, D. (2017) 'Costa Rica Thermal Dome Expedition: Scientific research on the high seas,' *Mission Blue*, 10th April. Available at: https://www.mission-blue.org/2017/04/costa-rica-thermal-dome-expedition-hard-science-on-the-high-seas/

CBD (2017) *Aichi Biodiversity Targets*. Available at: http://www.cbd.int/sp/targets/

CCAD (2010) *Regional Strategy on Climate Change*. Available at: http://www.sica.int/busqueda/secciones.aspx?IdItem=55544&IdCat=48&IdEnt=879

CCAMLR Commission. *History*. Available at: http://www.ccamlr.org/en/organisation/history

CCAMLR. *CCAMLR Scheme of International Scientific Observation*. Available at: https://www.ccamlr.org/en/science/ccamlr-scheme-international-scientific-observation-siso

CCAMLR. *Policy to enhance cooperation between its members and non-contracting Parties*. Available at: http://archive.ccamlr.org/pu/e/e_pubs/cm/06-07/coop.pdf

Chair's compilation of issues raised during the first session of the Preparatory Committee. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/PrepCom_1_Chair's_Overview.pdf

CITES Resolution Conf. 14.6 (Rev. CoP16). Available at: https://cites.org/eng/res/14/14-06R16.php

CMS. Factsheet: Migratory Marine Species in areas beyond the limits of national jurisdiction. Available at: http://www.cms.int/es/node/7413.

CMS. *The Strategic Plan for Migratory Species 2015-2023*. Available at: http://www.cms.int/sites/default/files/document/Res_11_02_Strategic_Plan_for_MS_2015_2023_E_0.pdf

Costa Rica and Monaco joint submission on marine protected areas in ABNJ. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_Monaco_BBNJ_Submission_MPAs.pdf

Costa Rica submission on area based management tools in ABNJ. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/streamlined/Costa_Rica.pdf

Costa Rica submission on working concepts. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_BBNJ_Submission_GP2.pdf

Costa Rica's submission on overarching principles for the Preparatory Committee on BBNJ. Available at: http://www.un.org/depts/los/biodiversity/prepcom_files/Costa_Rica_BBNJ_Submission_GP.pdf

Costa Rican Executive Decree Nº 34327-MINAE-MAG. Available at: http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=62657&nValor3=71665&strTipM=TC

DOALOS (2017) *Report of the Preparatory Committee established by General Assembly resolution 69/292. Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction. Advance, unedited version.* Available at http://www.un.org/depts/los/biodiversity/prepcom_files/Procedural_report_of_BBNJ_PrepCom.pdf

European Project Mediterranean Sea Acidification in a changing climate (MedSeA). *10 Facts on ocean acidification and warming of the Mediterranean Sea*. Available at: http://medsea-project.eu/wp-content/uploads/2015/02/10FACTS-short-final.pdf

FAO (2013) Fishery Statistical Collections: Consumption of Fish and Fishery Products in Central American countries. Available at: http://www.fao.org/fishery/statistics/global-consumption/en

FAO (2017) 'Database on Port State measures: Guatemala.' Available at: http://www.fao.org/fi/website/FISearchAction.do

FAO (2017) 'Parties to the Compliance Agreement.' Available at: http://www.fao.org/fileadmin/user_upload/legal/docs/012s-e.pdf

FAO (2017) 'Vulnerable Marine Ecosystems Database. A global inventory of fisheries measures to protect vulnerable marine ecosystems in areas beyond national jurisdiction.' Available at: http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/

FAO (2017) *Margarita Lizárraga Medal Award*. Available at: http://www.fao.org/fao-awards/conference-awards/margarita-lizarraga/en/

FAO (2017). 'Database on Port State measures: El Salvador.' Available at: http://www.fao.org/fi/website/FISearchAction.do

FAO International Guidelines for the Management of Deep Sea Fisheries in the High Seas. Available at: http://www.fao.org/docrep/011/i0816t/i0816t00.HTM

First session of the BBNJ Preparatory Committee at the United Nations. 28 March – 8 April 2016. Statement by Indonesia. Monday, March 28, 2016. Available at http://statements.unmeetings.org/media2/7656866/indonesia.pdf

Grynspan, R. (2017) 'Costa Rica a case of success,' El País, 7th May. Available at: http://economia.elpais.com/economia/2017/05/04/actualidad/1493916865_123722.html

High Seas Alliance (2016) *Ten Governance Principles for an International Legally Binding Instrument on Marine Biodiversity in Areas Beyond National Jurisdiction*. Available at: http://highseasalliance.org/sites/highseasalliance.org/files/HSA_10%20principles_English_web.pdf

IAC (2017) *Party countries*. Available at: http://www.iacseaturtle.org/paises-eng.htm

IATTC (2017) *Agreement on the International Dolphin Conservation Programme*. Available at: http://www.iattc.org/AIDCPdocumentationENG.htm

IATTC (2017) *Antigua Convention*. Available at: https://www.iattc.org/IATTCdocumentationENG.htm

ICRW (2017) Membership and Contracting Governments. Available at: https://iwc.int/members

IMO (2017) *Member States, IGOs and NGOs*. Available at: http://www.imo.org/en/About/Membership/Pages/Default.aspx

IMO (2017) Ocean Fertilization under the London Convention and London Protocol. Available at: http://www.imo.org/en/OurWork/Environment/LCLP/EmergingIssues/geoengineering/OceanFertilizationDocumentRepository/OceanFertilization/Pages/default.aspx

IMO (2017) *Structure of IMO*. Available at: http://www.imo.org/en/About/Pages/Structure.aspx

Inter-American Tropical Tuna Commission (2017) Vessel database: Active purse-seine vessels. Available at: https://www.iattc.org/VesselRegister/VesselList.aspx?List=AcPS&Lang=ENG

Interamerican Association for Environmental Defense (2015) *Comments of international law on the environmental impact of the Don Diego Project on marine dredging for the extraction of phosphate sands*. Available at: http://www.aida-americas.org/sites/default/files/press_releases/comentarios_a_la_mia_del_proyecto_don_diego.pdf,

Intergovernmental Oceanographic Commission, 'Criteria and Guidelines on the Transfer of Marine Technology,' (Paris: UNESCO, 2005). Available at: http://unesdoc.unesco.org/images/0013/001391/139193m.pdf

International Chamber of Shipping (2017) *Shipping and World trade*. Available at: http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade

International Hydrographic Organisation (2017) *Considering Alternatives for Managing Ship Traffic*. Available at: http://www.iho-machc.org/documents/ecctg1_doc.html#A, 28, 29.

ISA (2016) *Deep seabed minerals contractors*. Available at: https://www.isa.org.jm/deep-seabed-minerals-contractors

ISA. *Deep seabed minerals contractors*. *Polymetallic sulphides*. Available at: https://www.isa.org.jm/deep-seabed-minerals-contractors?qt-contractors_tabs_alt=1#qt-contractors_tabs_alt

IUCN (2008) *10 IUCN Principles for High Seas Governance*. Available at: (https://cmsdata.iucn.org/downloads/10_principles_for_high_seas_governance___final.pdf

M. Corgan (2008) 'Small State Diplomacy,' *E-International Relations*, August 12th. Available at: http://www.e-ir.info/2008/08/12/small-state-diplomacy

Long, T. (2017) '8-Country commitment shows Central America is serious about ending illegal fishing,' *The Pew Charitable Trust, Compass Points Blog*, 15 February. Available at: http://www.pewtrusts.org/en/research-and-analysis/blogs/compass-points/2017/02/15/8-country-commitment-shows-central-america-is-serious-about-ending-illegal-fishing.

Marine Conservation Institute (2016) *MPAtlas*. Available at: www.mpatlas.org

MarViva Foundation (2017) The Costa Rica Dome. Available at: http://crdome.marviva.net/?lang=en

MedSeA (2011) *Tipping the balance: CO2 and the Mediterranean Sea*. Available at: http://medsea-project.eu/wp-content/uploads/2011/08/MRUG-leaflet_lowresolut_def.pdf

Mehta, S. (2016) 'Victory: Mexico Seabed Mining Project Scrapped,' Earthworks. 13th May. Available at: https://www.earthworksaction.org/earthblog/detail/victory_mexico_seabed_mining_project_scrapped#.WRscllLMz3A

Memoradum of Understanding between the Regional Advisory Council for the Mediterranean Sea (RAC/MED) and the Food and Agriculture Organisation of the United Nations on behalf of the General Fisheries Commission for the Mediterranean. Available at: http://en.med-ac.eu/files/events_other/148_cgpm_mou.pdf

Memorandum of Understanding between CCAD and OSPESCA. Available at: http://www.sica.int/busqueda/Centro%20de%20Documentaci%C3%B3n.aspx?IDItem=74729&IdCat=25&IdEnt=47&Idm=1&IdmStyle=1

Memorandum of Understanding between IATTC and OSPESCA. Available at: http://www.sica.int/busqueda/Centro%20de%20Documentaci%C3%B3n.aspx?IDItem=79671&IdCat=25&IdEnt=47&Idm=1&IdmStyle=1

Memorandum of Understanding between OSPAR Commission and the International Seabed Authority. Available at: http://www.ospar.org/site/assets/files/1357/mou_isa.pdf.

Memorandum of Understanding between the Commission for the Conservation of Antarctic Marine Living Resources and the Secretariat for the Agreement on the Conservation of Albatrosses and Petrels. Available at: https://www.ccamlr.org/en/system/files/MoU%20ACAP.pdf

Memorandum of Understanding between the North Atlantic salmon conservation organisation and the OSPAR Commission. 2013. Available at: http://www.ospar.org/site/assets/files/1357/nasco_mou.pdf

Memorandum of Understanding between the North East Atlantic Fisheries Commission (NEAFC) and the OSPAR Commission. Available at: http://www.ospar.org/site/assets/files/1357/mou_neafc_ospar.pdf

Memorandum of Understanding between the OSPAR Commission and the International Council for the Exploration of the Sea. Available at: http://www.ospar.org/site/assets/files/1357/mou_ices_ospar.pdf

Memorandum of Understanding between the OSPAR Commission and the European Environment Agency. Available at: http://www.ospar.org/site/assets/files/1357/mou_eea_ospar.pdf

Memorandum of Understanding on the Conservation of Migratory Sharks. Signatories and Range States. Available at: http://www.cms.int/sharks/en/signatories-range-states

Mission Blue. *Hope Spots*. Available at: https://www.mission-blue.org/hope-spots/)

Moguel, S. (2016) 'Mexico protects loggerhead turtles from the Don Diego Mine,' *AIDA*, 25th April. Available at: http://www.aida-americas.org/release/mexico-protects-loggerhead-turtles-don-diego-mine

National Oceanic and Atmospheric Administration. National Centres of Environmental Information. Available at: https://www.ncei.noaa.gov

Non-binding instruments include the Convention on Biological Diversity Voluntary Guidelines for the consideration of Biodiversity in EIAs and SEAs in marine and coastal areas. Available at: https://www.cbd.int/doc/publications/imp-bio-eia-andseapdf

Organisation of Eastern Caribbean States. Public Resources Center. Available at: http://www.oecs.org/public-resources-centre/oecs-library

OSPAR Commission (2010) *Strategy of the OSPAR Commission for the protection of the marine environment of the North-East Atlantic 2010-2020*. Available at: http://www.ospar.org/site/assets/files/1413/10-03e_nea_environment_strategy.pdf

OSPAR Commission (2017) *International Cooperation*. Available at: http://www.ospar.org/about/international-cooperation/abidjan-convention

OSPAR Commission (2017) Observers. Available at: http://www.ospar.org/organisation/observers

OSPAR Commission (2017). OSPAR *Organisation*. Available at: http://www.ospar.org/organisation

OSPAR Commission and Sargasso Sea Alliance (2012) Collaboration arrangement between the Secretariats of OSPAR Commission and the Sargasso Sea Alliance. Available at: https://www.ospar.org/documents?v=32924.

Practical Arrangements between the International Atomic Energy Agency and the OSPAR Commission on sharing data on concentrations of radioactive substances in the OSPAR Maritime Area. Available at: http://www.ospar.org/about/international-cooperation/memoranda-of-understanding

Preliminary information indicative of the outer limits of the continental shelf beyond 200 nautical miles submitted by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/cri2009informacion_preliminar.pdf and the reservation note made by Nicaragua in relation to the preliminary information by Costa Rica. Available at: http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/nic_re_cri_2010_en.pdf

Regional Activity Centre for Specially Protected Areas (2017) *Specially Protected Areas of Mediterranean Importance*. Available at: http://www.rac-spa.org/sites/default/files/doc_spamis/liste_aspim_2016.pdf

Reilly, S. (2008) The IUCN Red List of Threatened Species. *Balaenoptera musculus*. Available at: http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T2477A9447146.en

Report of the 65th Meeting of the International Whaling Commission and associated meetings and workshops. Available at: https://archive.iwc.int/pages/search.php?search=%21collection24440&k

Sargasso Sea Commission. About the Commission. Available at: http://www.sargassoseacommission.org/about-the-commission/hamilton-declaration

Schuckman, D. (2017) 'Renewables' deep-sea mining conundrum,' BBC Science, 11th April. Available at: http://www.bbc.com/news/science-environment-39347620?S

SDG 14. Target 14.2. Available at: https://sustainabledevelopment.un.org/sdg14

Second session of the BBNJ Prepatory Committee at the United Nations. 26 August – 9 September 2016. Statement by the United States. Monday, March 28, 2016. Available at: http://statements.unmeetings.org/media2/7656861/united-states.pdf. Statement by the Russian Federation. Monday, March 28, 2016. Available at: http://statements.unmeetings.org/media2/7656834/russian-federation.pdf. Statement by Japan. Monday, March 28, 2016. Available at: http://statements.unmeetings.org/media2/7656879/japan.pdf. Statement by the European Union. Thursday, March 31, 2016. Available at: http://statements.unmeetings.org/media2/7658026/eu-statement-7-cbtmt-as-delivered-on-31-03-2016-.pdf

Secretaría de Agricultura y Ganadería de la República de Honduras (2016) 'Delegados de Pesca de Centroamérica conocen Acuerdo para eliminar la pesca illegal,' 6 Abril.

Available at: http://www.sag.gob.hn/sala-de-prensa/noticias/ano-2016/abril-2016/delegados-de-pesca-de-ca-conocen-acuerdo-para-eliminar-la-pesca-ilegal/

SICA (2017) *Member States and observers*. Available at: http://www.sica.int/miembros/miembros.aspx

South Atlantic Fishery Management Council (2002) *Fishery management plan for pelagic Sargassum habitat of the south Atlantic Region including a final environmental impact statement, initial regulatory flexibility analysis, regulatory impact review, and social impact assessment/fishery impact statement*. Available at: http://www.gc.noaa.gov/documents/gcil_safmc_fmp.pdf

TeleGeography (2017) *Submarine Cable Map*. Available at: http://submarinecablemap.com/#/submarine-cable/pan-american-crossing-pac.

Third Session of the BBNJ Preparatory Committee. March 26 – April 7, 2017. Statement of CBD. Wednesday, March 29, 2017. Available at http://statements.unmeetings.org/media2/14683376/-scbd-bbnj-29-mar-2017-.pdf

Torres, E. (2014) 'Centroamérica, el próximo nodo logístico mundial,' Forbes. 14 October. Available at: https://www.forbes.com.mx/centroamerica-el-proximo-nodo-logistico-mundial/

UNEP (2017) *Regional Seas Action Plans*. Available at: http://www.unep.org/regionalseas/who-we-are/regional-seas-action-plans

UNEP (2017) *Regional Seas Programme. North East Pacific Action Plan*. Available at: http://drustage.unep.org/regionalseas/north-east-pacific#

UNEP. *First Intergovernmental meeting of the Plan of Action of the Convention for cooperation in the protection and sustainable development of the marine and coastal environment of the North-East Pacific. Guatemala, 19-22 February 2002*. Available at: http://drustage.unep.org/regionalseas/sites/unep.org.regionalseas/files/documents/nep_IGM1_EN.pdf

UNEP. Plan of Action for the North-East Pacific Regional Seas Programme. Available at: http://wedocs.unep.org/bitstream/handle/20.500.11822/11137/nep_action_plan_en.pdf?sequence=1&isAllowed=y

UNESCO (2002) *IOC-Ocean Biogeographic Information System*. Available at: http://www.iobis.org

UNESCO (2003) *IOC Criteria and Guidelines on the Transfer of Marine Technology*. Available at: http://www.scor-int.org/SCOR_CB/CB-Bremen/IOC_Tech_Transfer.pdf

UNESCO World Heritage Center (2017) *Success stories*. Available at: http://whc.unesco.org/en/107/

UNESCO World Heritage Marine Programme (2017) *World Heritage Sites*. Available at: http://whc.unesco.org/en/marine-programme/

UNESCO- Intergovernmental Oceanographic Commission. Ocean Biogeographic Information System (OBIS). Available at: http://www.iobis.org/mapper/

UNESCO- World Heritage Centre List. Available at: http://whc.unesco.org/en/list/554

UNFCCC (2017) *Paris Agreement status of ratifications*. Available at: http://unfccc.int/paris_agreement/items/9444.php

United Nations Development Programme (2008) Capacity Development Practice Note, 6. Available at: http://www.adaptationundp.org/sites/default/files/downloads/pn_capacity_development1.pdf

United Nations Division for Ocean Affairs and the Law of the Sea. *A Regular Process for global reporting and assessment of the State of the marine environment, including socioeconomic aspects. Preliminary inventory of existing opportunities and arrangements for capacity building for assessments*. Available at: http://www.un.org/depts/los/global_reporting/consolidated_version_240613.pdf

United Nations Sustainable Development Agenda. Available at: http://www.un.org/sustainabledevelopment/development-agenda/

United Nations Sustainable Development Goals. Goal 14, Target 14. 4. Available at: https://sustainabledevelopment.un.org/sdg14

Watts, J. (2010) 'Costa Rica recognized for biodiversity protection,' The Guardian, 25th October. Available at: https://www.theguardian.com/environment/2010/oct/25/costa-rica-biodiversity

Wickström, H. Non-detriment Findings for the European eel - the Swedish Case. Available at: https://cites.org/sites/default/files/ndf_material/WG8-CS2-S.pdf

World Bank (2017) *Precautionary Management of Deep Sea Mining potential in Pacific Island countries*. Available at: http://pubdocs.worldbank.org/en/125321460949939983/Pacific-Possible-Deep-Sea-Mining.pdf