



UiT The Arctic University of Norway

Faculty of Law

The Role of RFMOs in the Conservation of Shortfin Mako Sharks in the Northern Atlantic Ocean

Anastasia Hohrjakova

Master's thesis in Law of the Sea JUR-3910-1 23V, September 2023

TABLE OF CONTENTS

- 1 INTRODUCTION..... 1
 - 1.1 Shark Conservation 1
 - 1.2 Purpose and Scope of the Thesis..... 4
 - 1.3 Methodology and Sources 5
 - 1.4 Structure of the Thesis..... 5
- 2 The International Legal Framework Governing RFMOs’ Operation 6
 - 2.1 Introduction 6
 - 2.2 The United Nations Law of the Sea Convention..... 7
 - 2.3 The United Nations Fish Stocks Agreement 10
 - 2.4 Other International Legal Instruments 13
 - 2.5 Regional Fisheries Management Organisations 15
 - 2.6 Concluding Remarks 18
- 3 RFMOs’ Role in Implementing and Operationalising Regulations 19
 - 3.1 Introduction 19
 - 3.2 The Conservation and Management Measures of Shortfin Makos 21
 - 3.2.1 ICCAT..... 21
 - 3.2.2 NAFO 28
 - 3.2.3 NEAFC..... 30
 - 3.3 Enforcement of Conservation and Management Measures..... 32
 - 3.4 Stakeholder Engagement and Cooperation 37
 - 3.5 Concluding Remarks 39
- 4 Challenges for RFMOs and Recommendations for Improving Shortfin Mako Conservation..... 41
 - 4.1 Introduction 41
 - 4.2 Lack of Cooperation and Collaboration 41
 - 4.3 Inadequate Conservation and Management Measures 45

4.4	Challenges in Compliance and Enforcement of Conservation and Management Measures.....	50
4.5	Concluding Remarks	52
5	Conclusion.....	54
	Works cited	56

LIST OF ABBREVIATIONS

CBD	Convention on Biological Diversity
CEM	Conservation and Enforcement Measures
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMM	Conservation and Management Measures
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CPC	Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organisation of the United Nations
ICCAT	The International Commission for the Conservation of Atlantic Tuna
ICES	International Council for the Exploration of the Sea
IPOA-Sharks	FAO-adopted International Plan of Action for the Conservation and Management of Sharks
ITLOS	International Tribunal for the Law of the Sea
IUU fishing	Illegal, Unreported and Unregulated Fishing
MCS	Monitoring, control and surveillance
MoU-Sharks	Memorandum of Understanding on the Conservation of Migratory Sharks
MSY	Maximum Sustainable Yield
NAFO	Northwest Atlantic Fisheries Organisation
NEAFC	Northern Atlantic Fisheries Commission
NPOA	National Plans of Action
OSPAR	Commission for the Protection of the Marine Environment in the North-East Atlantic
RFMO	Regional Fisheries Management Organisation
SCRS	Standing Committee on Research and Statistics
SRDCP	Shark Research and Data Collection Programme
TAC	Total Allowable Catch
UNCLOS	United Nations Law of the Sea Convention
UNFSA	United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks
VMS	Vessel monitoring systems

1 INTRODUCTION

1.1 Shark Conservation

Sharks have a vital ecological and economic function within global oceans, as both the health of marine ecosystems and the welfare of human communities rely upon their presence.¹ However, the populations of many shark species have declined by 71% since 1970 due to overfishing, bycatch, shark finning and other human activities.² The listed threats to shark populations are primarily driven by commercial fishing activities, which have intensified with the demand for shark products, particularly shark fins and the effects stemming from fishing activities for other targeted species.³ Further, the harvest level of different shark species is not considered sustainable, and creates harmful effects on the ecosystem that may likely happen if the degradation of shark stocks continues.⁴

Various species of migratory sharks are caught in the Northern Atlantic Ocean by industrial pelagic longline vessels of various nations, in both the exclusive economic zones (EEZ) and high seas and of coastal States, such as the vessels flying the flag of the US and different EU countries.⁵ The species included this research project are shortfin mako sharks (*Isurus oxyrinchus*). The particular species have been selected due to recent changes in international

¹ JE Techera and N Klein, *International Law of Sharks* (Brill | Nijhoff Leiden 2017) pp 3-4.

For detailed discussions about the significance to the ecosystem: Heithaus RM et al, 'Unraveling the Ecological Importance of Elasmobranchs' in Carrier CJ et al (ed), *Sharks and Their Relatives II: Biodiversity, Adaptive Physiology, and Conservation* (Taylor & Francis Group Florida 2019) pp 613-614, 619.

According to Heithaus and others, direct predation is the most studied mechanism of how shark populations affect the ecosystem. Direct predation is the consumption of prey, which may affect the populations of prey and competing species. When the shark populations decline, the prey populations can expand resulting in so-called cascading effects impacting the ecosystem as a whole.

For detailed discussions about the economic value: Bjørndal T et al, 'Social, Economic, and Regulatory Drivers of the Shark Fin Trade.' (2017) 22:3 *Marine Resource Economics*, pp 307 and 311. Sharks, particularly shark fins, were established as a part of Chinese cuisine from 1368-1644 AD; even before that, shark skin and bile were considered essential for medicinal purposes. Being luxurious seafood products, shark products play an important economic role in Asian countries (China and Hong Kong).

For detailed discussions about the social-economic value: Beuningen D et al, 'Fishing for survival: Importance of shark fisheries for the livelihoods of coastal communities in Western Ghana.' (2022) 246 *Fisheries Research*, p 2. Many coastal communities of developing countries depend on shark fishing as one of the main sources of income and nutrients.

² JE Techera and N Klein, n 1, p 3-4; Heidrich KN et al, 'Assessing progress in data reporting by tuna Regional Fisheries Management Organizations' (2022) 23:6 *Fish and Fisheries*, p 1265.

³ JE Techera and N Klein, n 1, p 1.

⁴ Field CI et al, 'Susceptibility of Sharks, Rays and Chimaeras to Global Extinction' (2009) 56 *Environmental Science*, p 279.

⁵ ICCAT, ICCAT Secretariat, Report for Biennial Period 2018–19, *Part I* (2019), available at https://www.iccat.int/Documents/BienRep/REP_EN_18-19_I-1.pdf, pp 231–32.

regulations,⁶ and the continuing development of conservation measures⁷ addressing the conservation of these sharks. Moreover, while shortfin makos are found worldwide, most are captured in the Northern Atlantic Ocean by EU vessels, particularly by vessels flying the flags of Spain and Portugal.⁸ Vessels capturing the shortfin makos primarily fish for other commercial species, while shortfin makos are considered ‘bycatch’ and retained due to their highly prized meat.⁹ The species are also one of the two main bycatch species caught by Spanish longline vessels targeting swordfish (*Xiphias gladius*).¹⁰ More importantly, according to the International Commission for the Conservation of Atlantic Tunas (ICCAT) assessment, the shortfin mako stocks were overfished by 32.5% in 2017,¹¹ and they will keep declining until 2035 unless the total catches are substantially decreased.¹² While overfishing continues to be the primary concern, the decline in the populations of shortfin makos might also be attributed to inadequate conservation and management measures (CMMs), alongside potential shortcomings in enforcing these measures by the flag States.

Given the migratory pattern of shortfin makos,¹³ the species are classified as part of the ‘highly migratory fish stocks category.’¹⁴ Consequently, the 1982 United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) is of relevance for the conservation of these species. UNFSA establishes the management of such fish stocks on the principles of the precautionary approach, and¹⁵ the ecosystem approach,¹⁶ as well as underlining the long-term conservation, the sustainable use of

⁶ Convention on International Trade in Endangered Species of Wild Fauna and Flora (adopted 3 March 1973, in force 1 July 1975) 993 UNTS 243, Appendix II.

⁷ See Chapter 3.2.1.

⁸ ICCAT, ICCAT Secretariat, Report for Biennial Period, n 5, p 231.

⁹ ICCAT, Fernández-Costa J et al, ‘Updated Standardized Catch Rates of Shortfin Mako (*Isurus Oxyrinchus*) Caught by the Spanish Surface Longline Fishery Targeting Swordfish in the Atlantic Ocean During the Period 1990–2015.’ (2017), available at https://www.iccat.int/Documents/CVSP/CV069_2013/n_4/CV069041657.pdf.

¹⁰ Dinkel MT and Sanchez-Lizas LJ, ‘Involving stakeholders in the evaluation of management strategies for shortfin mako (*Isurus oxyrinchus*) and blue shark (*Prionace glauca*) in the Spanish longline fisheries operating in the Atlantic Ocean.’ (2020) 120 *Marine Policy*, p 1.

¹¹ ICCAT, SCRS, Report – Panel 4. Swordfish. Billfishes. Sharks. Small tunas. *Presentation of the 2021* (2021), available at <https://www.iccat.int/Documents/SCRS/Presentation/2021/Panel4-2021.pptx>.

¹² ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting (2019) available at https://www.iccat.int/Documents/Meetings/Docs/2019/REPORTS/2019_SMA_SA_ENG.pdf, p 14.

¹³ *Ibid*, p 2.

¹⁴ See Chapter 2.2.

¹⁵ UNFSA, Articles 5(c) and 6.

¹⁶ UNFSA, Art 5(e).

fish stocks,¹⁷ and the protection of biodiversity.¹⁸ Moreover, the global community sees the UNFSA as a clear recognition that Regional Fisheries Management Organisations (RFMO) are the central bodies responsible for regulating regional fisheries¹⁹ and therefore, the aforementioned principles are essential in managing and conserving various fish stocks in the areas falling under the jurisdictions of RFMOs.

RFMOs are the main actors regulating fisheries in the areas beyond the territorial seas of coastal States, primarily in the high seas.²⁰ The RFMOs operating in the Northern Atlantic Ocean encompass the previously mentioned ICCAT, the Northern Atlantic Fisheries Commission (NEAFC), and the Northwest Atlantic Fisheries Organisation (NAFO). The responsibilities of these RFMOs include collecting and analysing scientific information on sharks and implementing binding measures to address shark conservation and management.²¹ Therefore, the role of the RFMOs in the conservation of sharks in the Northern Atlantic Ocean is assumed to be significant.

Shortfin makos are listed in Appendix II of the Convention on International Trade in Endangered Species (CITES),²² restricting their trade to “avoid utilisation incompatible with their survival.”²³ They are also subject to other international regulations, such as the Convention on Biological Diversity (CBD)²⁴ and the Convention on the Conservation of Migratory Species of Wild Animals (CMS).²⁵ Other significant non-binding regulations are contributing to the conservation of the shortfin makos in the Northern Atlantic Ocean, which are also taken into account in the research.²⁶

The issue of shark conservation in the Northern Atlantic Ocean is of significant concern due to the ecological importance of sharks. Even changes in the stocks of specific shark species, such

¹⁷ UNFSA, Preamble.

¹⁸ UNFSA, Art 5(g).

¹⁹ EJ Molenaar, ‘Regional Fisheries Management Organizations’ in Ribeiro CM et al (eds), *Global Challenges and the Law of the Sea* (Springer Nature Switzerland 2020) p 83.

²⁰ UNFSA, Art 3(1).

²¹ JE Techera and N Klein, n 1, p 165.

²² Convention on International Trade in Endangered Species of Wild Fauna and Flora (adopted 3 March 1973, in force 1 July 1975) 993 UNTS 243.

²³ CITES, Art II(2).

²⁴ United Nations Convention on Biological Diversity (adopted 5 June 1992, in force 29 December 1993) 1760 UNTS 69

²⁵ Convention on the Conservation of Migratory Species of Wild Animals (adopted 23 July 1979, in force 1 November 1983) 1651 UNTS 333.

²⁶ See Chapter 2.4.

as shortfin makos, can lead to imbalances in the marine ecosystem, negatively impacting global fisheries and other maritime industries.²⁷ Studying applicable conservation measures adopted by the RFMOs, and identifying the challenges they face in the operationalisation of these measures is crucial for shaping conservation policies and achieving the relevant conservation objectives.²⁸

1.2 Purpose and Scope of the Thesis

The thesis seeks to research the role of the RFMOs in addressing shortfin mako shark conservation and management in the Northern Atlantic Ocean. The primary objective is to examine the measures adopted by RFMOs with respect to the conservation of shortfin makos. In the scope of the examination, the thesis aims to assess the operationalisation of these measures and analyse their shortcomings. Furthermore, the thesis endeavours to offer suggestions to tackle any identified shortcomings.

While the thesis specifically focuses on the conservation of shortfin makos in the Northern Atlantic, the research findings and adopted conservation measures can potentially have broader implications. First, the conservation strategies, legal framework analysis, and recommendations developed in this thesis may also be relevant with respect to other shark populations in the Northern Atlantic. Second, they may extend to various shark species in other regions as shark populations in other regions face similar challenges.²⁹

The thesis does not delve into broader marine conservation issues or research other shark species beyond the Northern Atlantic Ocean.³⁰ Moreover, an assessment of the national legislation of coastal States, interacting with the relevant RFMOs, is also beyond the scope of the research project. Instead, the emphasis is put on how international regulations adopted by RFMOs impact shark conservation efforts in the management frameworks of these organisations.

²⁷ Boggs C et al, 'The Role of Sharks and Longline Fisheries in a Pelagic Ecosystem of the Central Pacific' (2002) 5 *Ecosystems*, p 202.

²⁸ UNFSA Art. 5.

²⁹ See, In particular NOAA. Bigelow K, Rice J and Carvalho F, 'Future Stock Projections of Oceanic Whitetip Sharks in the Western and Central Pacific Ocean' *PIFSC data report* (2022), p 3; Huang H et al, 'Blue Shark (*Prionace glauca*) Distribution in the Pacific Ocean: A Look at Continuity and Size Differences' (2023) 15 *Water*.

³⁰ While the main focus is on the conservation of shortfin mako sharks, it is worth noting that the broader framework governing sharks, in general, may also have relevance in the conservation efforts for this particular species. Therefore, an assessment of the broader framework is conducted to establish the legal regime specifically for the shortfin makos.

1.3 Methodology and Sources

The legal research in this thesis will involve a doctrinal analysis of the international legal framework for shark conservation, including relevant treaties, conventions, and soft-law instruments, as well as the conservation measures adopted by RFMOs operating in the Northern Atlantic Ocean. By examining the adopted measures of RFMOs, the thesis will develop a comprehensive understanding of their legal obligations, approaches, and practices concerning shortfin mako conservation.

The use of sources is determined in accordance with international law, precisely according to Article 38 of the Statutes of the International Court of Justice.³¹ International conventions, such as The 1994 United Nations Convention on the Law of the Sea (UNCLOS), provide a basis for analysing and interpreting other regulations. The soft-law instruments such as the FAO Code of Conduct for Responsible Fisheries (FAO Code of Conduct),³² FAO-adopted International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks)³³ and RFMOs' reports are used to provide more detailed insight. Secondary sources, legal literature, are reviewed and incorporated into the argumentation and overview contained in different chapters.

1.4 Structure of the Thesis

The thesis consists of five chapters that address different aspects of the conservation of shortfin makos in the Northern Atlantic Ocean. Chapter 2 provides an overview of the existing legal framework for the conservation of shortfin makos and discusses the main framework agreements such as UNCLOS, UNFSA and CITES, together with soft-law regulations that are relevant to shark conservation. Chapter 3 analyses the role of the RFMOs in implementing and enforcing the conservation measures. Chapter 4 addresses the identified challenges for the RFMOs in relation to the conservation and management of shortfin makos, addressing any potential gaps and shortcomings in current conservation measures. Further, the chapter aims to provide recommendations for RFMOs for improving shortfin mako conservation in the Northern Atlantic Ocean. Chapter 5 concludes the thesis by summarising the key findings from the previous chapters. It highlights the significance of the research and its implications for

³¹ Statute of the International Court of Justice (adopted 26 June 1945, in force 24 October 1945) USTS 993.

³² Food and Agricultural Organization of United Nations, Code of Conduct for Responsible Fisheries (adopted on 31 October 1995) ISBN 92-5-103834.

³³ Food and Agricultural Organization of United Nations, Technical Guidelines for Responsible Fisheries (2000) ISSN 1020-5292.

future shark conservation efforts in the Northern Atlantic. This structured approach provides a comprehensive understanding of the legal framework, RFMOs' roles, and recommendations for effective shortfin mako conservation in the Northern Atlantic Ocean.

2 The International Legal Framework Governing RFMOs' Operation

2.1 Introduction

The conservation of sharks is governed by global legal instruments establishing a framework of regulations aimed at the conservation and preservation of marine living resources and by specific measures implemented by RFMOs. These global instruments include primarily UNCLOS, UNFSA, CBD, CITES, Memorandum of Understanding on the Conservation of Migratory Sharks (MoU-Sharks),³⁴ the FAO Code of Conduct, and the IPOA-Sharks, which will be discussed in the next sub-chapters. Lastly, the RFMOs such as ICCAT, NEAFC and NAFO involved in shark conservation will be introduced. The global instruments are crucial for the initial examination of the broader legal framework applicable to shortfin makos, incorporating significant legal principles of international environmental law and including rights and obligations of coastal and flag States.³⁵ In addition, non-binding legal instruments are equally instrumental in the conservation of shortfin makos.

The assessment begins with an introduction and examination of the mandate of RFMOs alongside the relevant provisions of the UNCLOS and UNFSA, which serve as foundational instruments for RFMO operations. UNCLOS was adopted in 1982 and is a comprehensive legal framework governing the oceans. It is the most important legal instrument in the law of the sea, providing general definitions³⁶ and dividing the ocean into five categories: internal waters, territorial sea, exclusive economic zone, and high seas.³⁷ While the division of the maritime areas is a crucial aspect for establishing general legal rights and obligations for States in the various maritime zones,³⁸ the last parts of UNCLOS are devoted to more specific issues, such

³⁴ CMS, Memorandum of Understanding on the Conservation of Migratory Sharks (1 March 2010) IUCN TRE-154630.

³⁵ See UNCLOS.

³⁶ E.g. 'migratory species' in Articles 63 and 64 of UNCLOS.

³⁷ Tanaka Y, *The International Law of the Sea 2nd edition* (Cambridge University Press Cambridge 2019), pp 38 and 48.

³⁸ See UNCLOS Articles 17-21; 38-35; 52-54; 87-94.

as the protection and preservation of the marine environment.³⁹ UNFSA is the implementation agreement UNCLOS with the main goal ‘to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks through effective implementation of the relevant provisions of the Convention.’⁴⁰

2.2 The United Nations Law of the Sea Convention

Regional Fisheries Management Organisations are specific institutional mechanisms ensuring the effective fulfilment of the duty to cooperate and manage marine living resources introduced under UNFSA and UNCLOS.⁴¹ The duty to cooperate is established in the UNCLOS Articles 117, 118 and 119, acting as a foundation for the cooperation of the States and, thus, the establishment of RFMOs.⁴² Article 117 of UNCLOS encompasses regulations relevant to the conservation and management of living resources on the high seas and stipulates that ‘all States have the duty to take, or to cooperate with other States in taking, such measures for their respective nationals as may be necessary for the conservation of the living resources of the high seas.’ The provision accentuates the overarching duty of flag and non-flag States to protect and preserve the marine environment and take measures to conserve the living resources found within these areas.⁴³ Moreover, it serves as a basis for soft-law cooperation arrangements such as the IPOA-Sharks.⁴⁴ It further emphasises the significance of cooperation among States, whether through direct collaboration or appropriate international organisations such as RFMOs, to ensure these resources' conservation and sustainable utilisation.⁴⁵

Article 118 of UNCLOS plays a pivotal role in providing the legal basis for establishing RFMOs. This article recognises the rights and obligations of coastal States to establish or participate in RFMOs to manage, conserve, and exploit living resources within the high seas.⁴⁶ Article 119 further elaborates on the mandate of RFMOs, outlining the specific functions and responsibilities of RFMOs as custodians of fishery resources within their respective regions. It

³⁹ Tanaka Y, n 34, p 38.

The protection and preservation of the marine environment is the research topic of this thesis, and hence, a more detailed analysis of this issue is provided in subsequent sections.

⁴⁰ UNFSA, Art 2.

⁴¹ Rayfuse R ‘Article 118’ in Proelss (ed), *United Nation Convention on the Law of the Sea. A Commentary* (Verlag C. H. Beck oHG München 2017), p 820, par. 6.

⁴² Rayfuse R, ‘Regional Fisheries Management Organizations’ in Elfering AGO et al (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press Oxford 2015), pp 439-462.

⁴³ *Ibid*

⁴⁴ Rayfuse R ‘Article 117’ in Proelss (ed), n 38, p 813, par. 24.

⁴⁵ *Ibid*, p 813, par. 2-3.

⁴⁶ Rayfuse R ‘Article 118’ in Proelss (ed), n 38, p 827, par. 25.

empowers RFMOs to develop and implement CMMs for fishery resources. The recognition of the obligation to cooperate in establishing RFMOs under articles 116-119 of UNCLOS is further emphasised in UNFSA, which can be seen ‘as an operationalisation of the duty to cooperate.’⁴⁷ UNFSA Article 8 reaffirms the duty to cooperate in managing straddling and highly migratory fish stocks, stipulating that the cooperation should be facilitated through regional or subregional fisheries organisations or arrangements. In addition to imposing a legal basis for the establishment of RFMOs, both global instruments play an essential role in providing a framework for the conservation of sharks, including the shortfin makos. Thus, UNCLOS assigns distinct roles to coastal States, flag States, and port States regarding their obligations to protect the marine environment and living resources.⁴⁸

UNCLOS Articles 61 and 62 provide the rights of the coastal States to regulate fisheries in the EEZ. While RFMOs primarily have jurisdiction over the high seas,⁴⁹ the connection between the regulations of EEZ and the high seas is essential for comprehensive conservation efforts of shortfin makos. By cooperating with coastal States and regulating activities on the high seas, RFMOs can ensure that species like shortfin makos are safeguarded throughout their migrations through different jurisdictions. Article 61 highlights the obligation of coastal States to promote the conservation and management of living resources⁵⁰ and provides the concept of maximum sustainable yield (MSY).⁵¹ This articles gives the coastal States the authority and obligation to determine the allowable catch, adopt measures to ensure sustainable exploitation of living resources and establish regulations regarding minimum size limits, fishing seasons, and effort limitations. Articles 56, 61, and 62 acknowledge the role of coastal States in implementing measures to prevent overfishing and ensure the long-term sustainability of living resources.⁵²

Article 62 focuses on the rights and duties of coastal States in the conservation of highly migratory species, including certain shark species that may fall under this category. In the course of the UNCLOS III negotiations, an important decision was made to incorporate highly migratory species within the regulations of the EEZ. This decision was driven by recognising

⁴⁷ *Ibid*, n 38, p 824, par. 16.

⁴⁸ See Articles 94 and 192 of UNCLOS.

⁴⁹ UNFSA, Art 3(1).

⁵⁰ *The North Atlantic Coast Fisheries Case (Award) (Great Britain v United States of America)* [1910] PCA RIAA XI 167, p 14.

⁵¹ Harrison J, Morgera E, ‘Article 61’ in Proelss (ed), n 38, p 484.

⁵² Rothwell RD, Stephens T, *The International Law of the Sea. Second Edition* (Hart Publishing London 2016), p 91

the significant economic value associated with these species.⁵³ Annex I to the UNCLOS clarifies that the highly migratory species tuna, merlin, swordfish, sharks and some other species of marine mammals.’ Hence, shortfin makos, belonging to the *Isurida* family of oceanic sharks, are classified as highly migratory species and subject to specific ‘highly-migratory species’ regulations in UNCLOS. The inclusion of sharks in Annex I demonstrates the recognition of the significance of these species by States and the necessity to adopt a regulatory framework for their protection due to their ‘close stock-recruitment relationship, long recovery times in response to over-fishing and complex spatial structures (size/sex segregation and seasonal migration).’⁵⁴ In light of the subsequent decline in shark populations due to human activities driven by economic reasons, this inclusion can now be viewed as a critical decision in the global protection of sharks.

Under the same article, the coastal States are encouraged to cooperate with other States directly or through appropriate international organisations to ensure the conservation and management of highly migratory species.⁵⁵ In the context of regional fisheries management, RFMOs serve as the relevant international organisations established under the auspices of coastal States. Consequently, the duties and interests of coastal States under articles 63-67 of UNCLOS are emphasised in Article 117 essentially requiring them to ‘agree on the measures for the EEZ and the high seas in respect of [migratory species].’⁵⁶

On the high seas, States have, among other rights, the right to engage in fishing, subject to the due regard obligation in respect of other States’ freedoms.⁵⁷ While the exploitation of marine living resources within the exclusive economic zone (EEZ) and territorial sea falls under the jurisdiction of the coastal state, a different approach is adopted for the high seas. On the high seas, regulating the conduct of vessels is achieved by assigning exclusive jurisdiction to the flag state, as stated in Article 92(1).⁵⁸ The flag States are required to ‘effectively exercise its [their] jurisdiction and control’ over their vessels⁵⁹ by applying due diligence to ensure that their vessels follow the conservation and management measures.⁶⁰ The obligation is further

⁵³ Harrison J, Morgera E, ‘Article 64’ in Proelss (ed), n 38, p 515, par. 4.

⁵⁴ Harrison J, Morgera E, ‘Article 64’ in Proelss (ed), n 38, p 518, par. 13

⁵⁵ UNCLOS, Art 62.

⁵⁶ Rayfuse R ‘Article 117’ in Proelss (ed), n 38, p 806, par. 4.

⁵⁷ UNCLOS, Art 87(1)(e).

⁵⁸ Rayfuse R ‘Article 117’ in Proelss (ed), n 38, p 805, par. 2.

⁵⁹ UNCLOS, Art 93.

⁶⁰ *Request for an advisory opinion submitted by the Sub-Regional Fisheries Commission (SRFC) (Great Britain v United States of America)* (Advisory Opinion) ITLOS Rep. 21, par. 129.

recognised in UNFSA Articles 18 and 19, which are, first of all, necessary with respect to the enforcement of species-specific CMMs concerning sharks and the regulation of Illegal, Unreported and Unregulated Fishing (IUU fishing).⁶¹ Moreover, Article 18(2) of UNFSA mandates the States to abstain from permitting their vessels to engage in high seas fisheries unless they can effectively exercise their flag state jurisdiction.

Securing the effective management of shortfin makos and the sustainable utilisation of their stocks requires adherence to and enforcement of the measures adopted by RFMOs. Hence, the provisions envisaged in both UNFSA and UNCLOS are essential in providing a basis for flag state compliance with RFMO measures. Alongside flag state enforcement measures, port state enforcement⁶² in the context of RFMOs is another critical aspect as it may enforce the CMMs of RFMOs concerning IUU fishing of sharks. The dependence on the port state enforcement has increased due to insufficient efforts of flag States in effectively monitoring and regulating their fishing vessels.⁶³ However, on the high seas, enforcement of conservation and management measures for living resources is typically the responsibility of the flag State and is governed by relevant international agreements and organisations such as RFMOs. Hence, UNCLOS does not explicitly address port state enforcement in relation to living resources on the high seas. The port state enforcement is discussed in the next chapter.

2.3 The United Nations Fish Stocks Agreement

UNFSA is an unarguably relevant legal instrument in relation to the RFMOs as it outlines specific details regarding the matters that require regulation by RFMOs and arrangements responsible for highly migratory fish stocks. Moreover, it contains several general customary international obligations, such as the precautionary approach contained in UNCLOS.⁶⁴

According to Article 3(1) of UNFSA, its application extends primarily beyond areas under national jurisdiction, encompassing the EEZ and high seas, where RFMOs are engaging in the conservation and management of fisheries. UNFSA incorporates fundamental principles of international environmental law outlined in the Rio Declaration on Environment and

⁶¹ JE Techera and N Klein, n 1, p 188; Guilfoyle D 'Article 92' in Proelss (ed), p 702, par. 8.

⁶² UNFSA Art. 23.

⁶³ JE Techera and N Klein, n 1, p 191.

⁶⁴ Harrison J, Morgera E, 'Article 63' in Proelss (ed), n 38, p 511, par. 9.

Development of 1992,⁶⁵ with particular emphasis on sustainable development⁶⁶ and the precautionary and ecosystem approaches.⁶⁷

Article 5 of UNFSA encompasses general principles for the conservation and management of fisheries on the high seas, imposing specific obligations on coastal States with respect to their duty to cooperate. Article 5(a) of the UNFSA elaborates on sustainable development, requiring States to adopt conservation measures to ensure long-term sustainability and promote optimum utilisation. The concept of sustainable development is endorsed in the Rio Declaration, and in simpler terms, the principle dictates that living resources should not be exploited beyond their regeneration capacity.⁶⁸ This provision is particularly relevant to the conservation of shortfin makos, as it is a species with low reproductive rates and faces challenges due to being caught by specific fishing gear.⁶⁹ Sustainable fishing practices and conservation efforts are essential to prevent overexploitation and depletion of the shortfin mako population in the Northern Atlantic.

The ecosystem approach is incorporated in Article 119(b) of the UNCLOS stipulating the allowable catch limits and further developed in Article 5 of UNFSA.⁷⁰ The latest requires the States to ‘assess the impacts of fishing, other human activities and environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks.’⁷¹ Moreover, States have an obligation to ‘minimize pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species.’⁷² Hence, many RFMOs position shortfin makos as non-targeted species.⁷³ This approach considers the interactions between the shortfin makos and its broader ecosystem, including its prey species and habitat. Notably, the regulation obliges the States to reduce the capture of non-target species, an

⁶⁵ UNCED, The Rio Declaration on the Environment and Development (1992) ILM 31, 874.

⁶⁶ UNFSA, Preamble, Art 5(a).

⁶⁷ UNFSA, Art 5(d)-(l).

⁶⁸ The Rio Declaration on the Environment and Development, Principle 1; See also UNGA Res 37/7 (1982), Art. 10(a);

⁶⁹ Arocha F et al, ‘Ecological risk assessment of pelagic sharks caught in Atlantic pelagic longline fisheries’ (2010) 21 *Aquatic Living Resources*, p 32.

⁷⁰ Rayfuse R ‘Article 117’ in Proelss (ed), p 837, par. 15.

⁷¹ UNFSA, Art 5(e).

⁷² UNFSA, Art 7(e).

⁷³ See Chapter 3.2.

important consideration given that shortfin mako sharks are mainly classified as non-target species commonly captured incidentally together with swordfish and tuna.⁷⁴

Further, UNFSA States an obligation on coastal States to ‘apply the precautionary approach to the conservation, management and exploitation of highly migratory fish stocks’ found within their EEZ and on the high seas.⁷⁵ Among other things, under the precautionary approach, the States shall improve decision-making for fishery-resource conservation and management,⁷⁶ develop data collection and research programmes,⁷⁷ and apply the approach according to the further guidelines stated in Annex II. Annex II guides the States on the application of the precautionary approach by the identification of precautionary reference points – ‘conservation’ or ‘limit’ reference points and ‘management’ or ‘target’ reference points.⁷⁸ The first reference points establish a safe biological threshold within which the stock can sustainably produce its MSY. The management/target reference points are set to reflect specific management objectives, and both apply to target and non-target species.⁷⁹ In the context of conservation of sharks, the precautionary approach shall be applied due to the low productivity of shark stocks and their slow recovering from overfishing.

Additionally, UNFSA establishes an obligation that the CMMs implemented on the high seas and those applied to areas under national jurisdiction must be harmonised to guarantee the comprehensive protection and sustainable management of straddling fish stocks and highly migratory fish stocks (compatibility principle).⁸⁰ This corresponds with the previously underlined stipulation that the connection between the regulations of EEZ and the high seas is essential for comprehensive conservation efforts of shortfin makos. Lastly, articles 8-13 of the UNFSA establish regulations for the establishment, functioning and strengthening of sub-regional and regional fisheries management organisations.⁸¹

⁷⁴ Belhabib D, Rosello M, and Vilata J, ‘Atlantic Shortfin Mako: Chronicle of a death foretold?’ (2021) 10 *Laws*, p 1

⁷⁵ UNFSA, Art 6(f).

⁷⁶ UNFSA, Art 6(3)(a).

⁷⁷ UNFSA, Art 3(d).

⁷⁸ UNFSA, Annex II.

⁷⁹ FAO Code of Conduct Art. 7.5.2.

⁸⁰ UNFSA, Art 7

⁸¹ In particular, UNFSA Art. 12(1) establishes the requirement for transparency; UNFSA Art 11 provides guidance for determining the participation rights in the RFMOs.

In addition to the duties of the flag States to ensure compliance with the CMMs by flag States under Articles 18 and 19, UNFSA has a separate section tackling enforcement by port States under Article 23. The provision enables the port States to apply measures when fishing vessels enter the port and verify catch, fishing gear and documents to ensure the effective implementation of CMM measures.⁸² The port state enforcement is essential, for instance, in the enforcement of finning bans and different CMM measures specific to shortfin makos.

2.4 Other International Legal Instruments

The international legal framework governing fisheries comprises various global legally binding instruments, with particular relevance to the thesis topic found in the Convention on International Trade in Endangered Species of Wild Fauna and Flora and the Convention on Biological Diversity. CBD primarily focuses on the conservation and sustainable use of biodiversity globally.⁸³ While the CBD does not explicitly regulate the protection and conservation of sharks, it does play a role in addressing the broader issues related to marine biodiversity and the conservation of marine species, including sharks.⁸⁴ CBD's objectives may indirectly influence the protection and management of sharks through its efforts to safeguard marine ecosystems and the broader diversity of marine life.⁸⁵

CITES, on the other hand, directly addresses the conservation of sharks. The convention serves as an international legal instrument that safeguards certain species from over-exploitation caused by international trade.⁸⁶ It accomplishes this by determining the threatened status of species and implementing appropriate trade measures to protect them.⁸⁷ Shortfin makos, among other shark species, have been listed in the CITES Appendix II as an endangered species since 2019, meaning that the States need to apply specific rules to their export, re-export and import.⁸⁸

Perhaps the most significant role in shark conservation through collaboration with RFMOs is found in legally non-binding instruments adopted under the auspices of international conventions, particularly the MoU-Sharks, the FAO Code of Conduct and IPOA-Sharks. The

⁸² JE Techera and N Klein, n 1, p 191

⁸³ CBD, Preamble.

⁸⁴ CBD, Art 2.

⁸⁵ CBD, Art 22(2); Boyle A in Elfering AGO et al (eds), n 39, pp 139-140.

⁸⁶ CITES, Preamble.

⁸⁷ CITES, Articles III-V. In particular, species under Annex I shall require the prior grant and presentation of an export permit under CITES, Art III(2).

⁸⁸ CITES, Art IV.

MoU-Sharks was founded under CMS and aims ‘to improve the conservation status of migratory sharks /.../ through concerted and coordinated action, including compliance and enforcement efforts.’⁸⁹ The shortfin makos are recognised as priority species listed in Annex 1 to the MoU-Sharks. Therefore, they are subject to the specific conservation plan and other regulations in the instrument. The conservation plan entails several objectives⁹⁰ that should be implemented through, *inter alia*, already existing RFMOs and through establishing new regional and sub-regional arrangements where necessary.⁹¹ The MoU-Sharks could potentially influence the adoption of CMMs within RFMOs, thereby collectively enhancing endeavours for the more effective and comprehensive conservation of shortfin makos.

Another essential but non-binding legal instrument is the FAO Code of Conduct for Responsible Fisheries, which establishes a framework for the sustainable exploitation of living resources and provides principles and standards focused on the conservation, management, and development of all fisheries.⁹² The Code of Conduct encourages concerned States to cooperate ‘where appropriate, through establishing a bilateral, subregional or regional fisheries organization or arrangement’ in managing straddling stocks.⁹³ More notably, in 1999, the FAO adopted the IPOA-Sharks, aimed at ensuring the long-term sustainable use of sharks. It urges States to implement, develop and monitor national plans for shark conservation. In cases where multiple States exploit shared, migratory, or high-seas shark stocks, the regulation stipulates that States should collaborate on regional or sub-regional plans for effective conservation of these stocks, underlining the importance of RFMOs in the conservation of sharks.⁹⁴ As an example of the relevant IPOA-Sharks’ impact on the RFMOs, the General Assembly of FAO has urged RFMOs to implement precautionary CMMs for sharks captured in fisheries as bycatch. It is worth noting that certain States and RFMOs have implemented legislative measures to prohibit shark finning as a result of IPOA-Sharks’ impact (refer to Chapter 3.2.).⁹⁵

⁸⁹ MoU, Preamble.

⁹⁰ See MoU, Annex 3. The objectives include: ‘Improving understanding of migratory shark populations through research, monitoring and information exchange,’ ‘Ensuring to the extent practicable the protection of critical habitats and migratory corridors and critical life stages of sharks,’ ‘Increasing public awareness of threats to sharks and their habitats, and enhance public participation in conservation activities,’ ‘Ensuring that directed and non-directed fisheries for sharks are sustainable,’ ‘Enhancing national, regional and international cooperation.’

⁹¹ MoU, Annex 3(III).

⁹² FAO Code of Conduct for Responsible Fisheries, Preface.

⁹³ *Ibid*, Art 7.1.3.

⁹⁴ Harrison J, Morgera E, ‘Article 66’ in Proelss (ed), n 38, p 519, par. 14.

⁹⁵ *Ibid*, n 38, p 519, par. 14; ICCAT Recommendation 04-10, BYC; NAFO Conservation and Enforcement Measures (2023) N7368, Art 12(1)(b)

Indeed, the role of RFMO in the conservation efforts toward shortfin makos is strengthened and complemented by various non-binding legal instruments, such as the MoU-Sharks and the IPOA-Sharks. By aligning their efforts with non-binding legal instruments, RFMOs can strengthen their conservation initiatives and ensure more comprehensive protection for shortfin mako sharks and other migratory species.

2.5 Regional Fisheries Management Organisations

The next part focuses on the introduction of the International Commission for the Conservation of Atlantic Tunas, the North East Atlantic Fisheries Commission, and the Northwest Atlantic Fisheries Organisation. NAFO, NEAFC and ICCAT all cover some or all parts of the Northern Atlantic Ocean. The ICCAT's jurisdiction encompasses both the Southern and Northern areas of the Atlantic Ocean, with overlapping jurisdictions of NAFO and NEAFC in the Northern part.⁹⁶ While NAFO and ICCAT are entitled to manage the resources in the EEZs of coastal States,⁹⁷ NEAFC's jurisdiction covers only the high seas adjacent to the Western part of Europe and the Arctic.⁹⁸ The organisations primarily establish their foundational principles and operational frameworks through conventions, which serve as the cornerstone documents of these organisations.⁹⁹

NAFO was established in 1979 with the primary objective of conserving and managing fisheries resources in the Northwest Atlantic Ocean.¹⁰⁰ The NAFO Convention applies to 'all fishery resources,' except for tuna, marlin, salmon and cetaceans.¹⁰¹ NAFO took the lead in shark conservation and management by establishing a shark catch limit in 2004 for a targeted fishery.¹⁰² Other implemented shark-specific CMMs include the requirement for sharks to be landed with fins attached to prevent wasteful practices.¹⁰³ In the scope of the organisation's mandate, NAFO has specifically included shortfin makos and monitors their reported catches,

⁹⁶ Meltzer E, 'Global Overview of Straddling and Highly Migratory Fish Stocks: Maps and Charts Detailing RFMO Coverage and Implementation' (2005) 20 *The International Journal of Marine and Coastal Law*, pp 577 and 575.

⁹⁷ NAFO Convention area covers Canada, Greenland, St. Pierre et Miquelon and the US. See more 'NAFO Convention Area,' available at: <https://www.nafo.int/About-us/Maps> (accessed 29.08.2023).

⁹⁸ 'NEAFC Convention Area,' available at: https://www.neafc.org/system/files/neafc-conv-and-ra_0.jpg (accessed on 29.08.2023)

⁹⁹ See Convention on Cooperation in the Northwest Atlantic Fisheries (NAFO Convention) (2017).

¹⁰⁰ NAFO Convention.

¹⁰¹ NAFO Convention, Art 1(4).

¹⁰² JE Techera and N Klein, n 1, p 14.

¹⁰³ JE Techera and N Klein, n 1, p 14.

providing compliance review with a total catches and retentions of shortfin makos and their percentage among other shark species.¹⁰⁴

ICCAT stands out as one the most active RFMOs in the conservation of shortfin makos in the Northern Atlantic as it directly addresses the named species and actively engages with other relevant stakeholders.¹⁰⁵ The core foundation text for ICCAT's operations and responsibilities is the ICCAT Convention.¹⁰⁶ The objective of the organisation, according to the convention, is to conserve the 'resources of tuna and tuna-like fishes of the Atlantic Ocean and its adjacent waters.'¹⁰⁷ The convention outlines the responsibilities of the organisation, extending to fisheries such as tuna, tuna-like fishes, and 'other species of fish exploited in tuna.'¹⁰⁸ Although the text of the ICCAT Convention does not explicitly reference sharks, the second part of Article IV(5) ('such other species of fishes exploited in tuna fishing') broadens the organisation's mandate to encompass certain species, thus including sharks. Therefore, some species of sharks are monitored and studied by ICCAT as well, including, but not limited to, shortfin makos.¹⁰⁹ These sharks are categorised as a non-targeted species 'associated with or dependent upon the major target stocks' (tuna and tuna-like) within ICCAT.¹¹⁰

The ICCAT plays a critical role in the study of fisheries within its jurisdiction. The studies of fisheries involve collecting and analysing statistical information on the current status and trends of resources,¹¹¹ evaluating various measures and methods to maintain the fish populations at sustainable levels, and ensuring effective exploitation aligned with these catch levels.¹¹² The organisation also recommends studies and investigations to the contracting parties and disseminates reports containing its findings and scientific information relevant to the tuna fisheries in its jurisdiction.¹¹³

¹⁰⁴ NAFO Annual Fisheries and Compliance Review (2020) NAFO/COM Doc. 20-17, p 9.

¹⁰⁵ See Chapters 3.2-3.4.

¹⁰⁶ International Convention for the Conservation of Atlantic Tunas (ICCAT Convention) (1972) 7th Revision.

¹⁰⁷ *Ibid*, Preamble.

¹⁰⁸ *Ibid*, Art IV(2). In particular 'the Commission shall be responsible for the study of the populations of tuna and tuna-like fishes /.../ and such other species of fishes exploited in tuna fishing /.../.'

¹⁰⁹ ICCAT, 'Compendium Management Recommendations and Resolutions Adopted by ICCAT for the Conservation of Atlantic Tunas and Tuna-Like Species' (2023), p 211.

¹¹⁰ ICCAT, Report of the Independent Performance Review of ICCAT (2016), available at: https://www.iccat.int/documents/other/0-2nd_performance_review_tri.pdf, p 16;

¹¹¹ International Convention for the Conservation of Atlantic Tunas, art IV.

¹¹² *Ibid*.

¹¹³ ICCAT Convention, art IV.

Moreover, the contracting parties, together with the European Commission, have been in the process of amending the ICCAT Convention since 2019.¹¹⁴ The revised text of the ICCAT Convention has an essential impact on shortfin makos and sharks in general, as the covered species, according to the text, will include ‘elasmobranchs¹¹⁵ that are oceanic, pelagic, and highly migratory,’¹¹⁶ while in the current version, the covered species do not refer to elasmobranchs or sharks as specified above.¹¹⁷ It means that sharks are now included as targeted species in the new text of the ICCAT Convention and are not limited to bycatch species. By explicitly including elasmobranchs in the covered species, the new ICCAT Convention recognises the unique conservation needs of the highly migratory sharks and enhances the effectiveness of its measures. This ensures that specific attention and measures are devoted to protecting their populations and provides a particular basis for developing conservation measures.

NEAFC strives ‘to ensure the long-term conservation and optimum utilisation of the fishery resources in the convention area, providing sustainable economic, environmental and social benefits.’¹¹⁸ The organisation adopts measures for the Atlantic and Arctic Oceans down to the south of Spain, excluding the Baltic and Mediterranean Seas.¹¹⁹ It has issued species-specific recommendations with respect to the conservation of porbeagles,¹²⁰ basking sharks,¹²¹ and other specific deep-sea sharks.¹²² However, NEAFC has not implemented shortfin mako-specific measures. Instead, they have issued a general ‘Recommendation on Conservation of Sharks Caught in Association with Fisheries Managed by the North-East Atlantic Fisheries Commission.’¹²³ The mandate to regulate sharks is given to the organisation under Article 5 of the NEAFC Convention, stipulating that it ‘shall seek to ensure consistency between /.../ any recommendation that would have an effect through species inter-relationships on a stock or group of stocks occurring in whole or in part within an area under the jurisdiction of a

¹¹⁴ Draft Protocol to Amend the International Convention for the Conservation of Atlantic Tunas (2019) PLE_108.

¹¹⁵ Encyclopedia Britannica, ‘Sharks, rays, and skates,’ available online: <https://www.britannica.com/animal/chondrichthian> (accessed on 12.07.2023)

¹¹⁶ Draft Protocol to Amend the International Convention for the Conservation of Atlantic Tunas, Art 4.

¹¹⁷ International Convention for the Conservation of Atlantic Tunas, art IV.

¹¹⁸ Convention on Future Multilateral Cooperation in North-East Atlantic Fisheries (NEAFC Convention) (adopted on 18 November 1980, in force from 1982), Art 2.

¹¹⁹ NEAFC Convention, Art 1(a).

¹²⁰ NEAFC Recommendation 7:2020.

¹²¹ NEAFC Recommendation 8:2020.

¹²² NEAFC Recommendation 9:2020.

¹²³ NEAFC Recommendation 10:2015.

Contracting Party.¹²⁴ Moreover, NEAFC is essentially entitled to manage shortfin makos as the definition ‘fishery resources’ referred to under the NEAFC Convention¹²⁵ includes the highly migratory species listed in Annex I of UNCLOS.

2.6 Concluding Remarks

The conservation of shortfin makos in the Northern Atlantic Ocean represents a complex interplay of international legal instruments and the operations of RFMOs. The global instruments, such as UNCLOS, UNFSA, CBD, and CITES, encompass principles of cooperation, sustainability, and precaution, which guide the actions of both States and RFMOs in their conservation efforts. Furthermore, UNCLOS and UNFSA set out rights and obligations upon coastal, flag, and port States, serving as a critical foundation for the implementation and enforcement of CMMs.

The RFMOs under the study play a crucial role in operationalising the principles and obligations of Member States to the UNFSA. ICCAT, primarily focused on tuna conservation in the Atlantic Ocean, has included shark conservation in the scope of its mandate. Notably, ICCAT is the only RFMO that has implemented species-specific CMMs addressing the management and conservation of shortfin makos. NAFO and NEAFC, on the other hand, are engaged in the protection of other shark species and enact general measures.

In conjunction with legally binding frameworks, non-binding accords such as MoU-Sharks, FAO Code of Conduct, and IPOA-Sharks enhance collaborative endeavours. These agreements, while lacking legally binding force, play a pivotal role in amplifying the cooperation among States and international organisations.

¹²⁴ NEAFC Convention, Art 5(2)(a).

¹²⁵ NEAFC, Art 1(b).

3 RFMOs' Role in Implementing and Operationalising Regulations

3.1 Introduction

This chapter aims to research the role of the RFMOs in implementing and operationalising regulations in respect of shortfin makos by delving into the CMMs adopted by the RFMOs, as well as into their monitoring and compliance efforts. The primary emphasis is on studying ICCAT, NAFO and NEAFC, which are actively participating in the conservation of shortfin makos in the Northern Atlantic Ocean. ICCAT is at the centre of the analysis because it has adopted the most extensive package of measures dedicated to the conservation of shortfin makos and has been active in engagement with essential stakeholders. The measures are essentially established by RFMOs both as legally binding and non-legally binding resolutions or recommendations and are designed to promote specific behaviours of the contracting parties.¹²⁶

Sharks are often classified as non-targeted, bycatch or associated species, as seen in Chapter 2.5. This classification reflects the incidental nature of their capture rather than being the primary focus of fishing efforts. In response to this concern and in line with the precautionary approach, the FAO Code of Conduct addresses the requirement of minimising the catch of non-target species by implementing appropriate measures.¹²⁷ It is important to mention that the CMM measures could be adopted as species-specific or general. Species-specific measures are adopted to provide special protection to shark stocks, which are biologically more vulnerable, as provided in IPOA-Sharks.¹²⁸ In respect of selected shark species, RFMOs have implemented species-based measures to minimise bycatch.¹²⁹

The main CMMs adopted by RFMOs include stock assessment, management of fishing efforts, allocation of fishing opportunities, compliance and enforcement, and protection of the wider marine environment.¹³⁰ Firstly, the stock assessment measures provide RFMOs with the information to set catch limits and allocate rights. The assessment is carried out based on data reporting rules encompassing effort, catches, and discards in fisheries, which is often a

¹²⁶ JE Techera and N Klein, n 1, p 152.

¹²⁷ FAO Code of Conduct for Responsible Fisheries, Art 7.5.2.

¹²⁸ IPOA-Sharks, 1.3.

¹²⁹ E.g. ICCAT Recommendation 17-08, BYC; NAFO Conservation and Management Measures Art. 12(1)(d).

¹³⁰ Rayfuse R in Elfering AGO et al (eds), n 39, p 450.

compulsory requirement for States whose vessels are engaged in fishing for particular species.¹³¹ The recordings are needed as they provide information on the removal of sharks from the ecosystem and the biological implications of discarded sharks.¹³² The requirement for data reporting has grown more complex and detailed over time, now requiring more extensive and accurate data, suggesting that the scientific uncertainty around fisheries is still somewhat considerable.¹³³

The fishing effort measures are often of restrictive character, including fishing gear restrictions, seasonal and area disclosures, catch quotas and other effort restrictions. These measures are implemented to protect primarily newborn juvenile sharks and to ensure sustainable fishery practices.¹³⁴ Other standard fishing measures include catch limits or total allowable catches (TACs), promoting responsible fisheries and ensuring that sharks are not overfished.¹³⁵ Moreover, the RFMOs under the study divide TAC for shortfin makos into national quotas per state.¹³⁶ Quota assignments among contracting parties are generally based on historical catch and capacity, considering scientific advice on stock status. For example, ICCAT has set specific retention quotas for each state engaged with shortfin mako fisheries to be calculated based on a predetermined method (refer to Chapter 3.2).

The fishing efforts also involve implementing gear measures, which could be used to reduce the fishing mortality of sharks and their catchability.¹³⁷ An equally significant tool for the conservation of sharks comprises spatial or area-based measures. The spatial and area-based measures are specific designated protected areas where adopted regulations and rules governing particular activities within the protected area contribute to the protection of shark mating, pupping and nursery areas.¹³⁸

¹³¹ See more in Cortés E, ‘Incorporating Uncertainty into Demographic Modeling: Application to Shark Populations and Their Conservation.’ (2002) 16 *Conservation Biology*, pp 1058-1059. ‘Management efforts targeted at juveniles or adults are likely to be most effective for the recovery’ of fish stocks. In addition, minimum size limits of individuals could be effective measures to enhance the reproduction of species.

¹³² IPOA-Sharks, Art. 5.6.1.

¹³³ Rayfuse R in Elfering AGO et al (eds), n 39, p 451. For comparison, see ICCAT Recommendation 19-06, BYC and ICCAT Recommendation 21-09, BYC.

¹³⁴ IPOA-Sharks, Art. 6.2.1.

¹³⁵ Rayfuse R in Elfering AGO et al (eds), n 39, p 452; Sharks-IPOA 6.2.1.

¹³⁶ Ibid, pp 452-453. For reference, see also ICCAT Recommendation 21-09.

¹³⁷ JE Techera and N Klein, n 1, pp 102-103; IPOA-Sharks, Art. 6.2.2.

¹³⁸ JE Techera and N Klein, n 1, p 114; IPOA-Sharks, Art. 5.8.

Compliance and enforcement of CMMs might be the most challenging part for the RFMOs, discouraging the effective implementation of shortfin mako-specific measures (see Chapter 4.4). While flag States are responsible for adhering to CMMs, RFMOs continue to serve as the central authorities tasked with ensuring the measures are adhered to by the fishing vessels of flag States. In the context of enforcement, the RFMOs are required to ensure that vessels comply with CMMs by implementing measures such as observer programmes, inspection, and vessel monitoring.¹³⁹ Observers gather direct measurements, interviews, and surveys using questionnaires on vessels and landing sites. They collect catch, effort, biological, bycatch, and environmental data, along with value and trade information. At-sea observers record catch, effort, gear, and biological data, cross-referencing with vessel logbooks. Observers at landing sites collect landing data, carcass specifics, and biological details.¹⁴⁰

The following chapter reveals that ICCAT, NEAFC and NAFO have the potential to enforce measures that are advocated in non-binding legal instruments such as the IPOA-Sharks.¹⁴¹ Furthermore, it is crucial to recognise that RFMOs hold significant roles in collaborative efforts alongside global stakeholders and nations.¹⁴²

3.2 The Conservation and Management Measures of Shortfin Makos

This chapter delves into the CMMs established under ICCAT, NEAFC and NAFO and analyses the initial aspect of RFMOs' role in the conservation of shortfin makos in the Northern Atlantic Ocean. It explores species-specific measures established for the conservation of shortfin makos and general measures addressed to the conservation of sharks and, therefore, biodiversity as a whole.¹⁴³ The chapter is divided between ICCAT, NAFO and NEAFC to create a better overview of the CMMs adopted by each organisation.

3.2.1 ICCAT

The conservation measures and efforts adopted by the organisation can be found primarily in documents named recommendations and resolutions. The recommendations implemented by ICCAT are binding to its contracting parties.¹⁴⁴ In respect to species-specific measures

¹³⁹ FAO Code of Conduct 7.7.3.

¹⁴⁰ IPOA-Sharks, Art. 5.7.2

¹⁴¹ See Chapter 3.4.

¹⁴² See Chapter 3.3.

¹⁴³ IPOA-Sharks, Art 1.3.

¹⁴⁴ ICCAT Resolution 02-29.

concerning the shortfin makos, the ICCAT has adopted various recommendations starting from 2007 based on the data collected by Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities (CPCs) and compiled into shortfin mako stock assessment reports by Standing Committee on Research and Statistics (SCRS).¹⁴⁵ The CPCs generally collect data on biological and fishing figures, e.g. the number of hooked sharks, their body length, sex, condition, maturity, weight, fishing effort, number of discards, live releases and retains.¹⁴⁶ The guidelines for shark stock assessments are further outlined in IPOA-Sharks.¹⁴⁷

A noteworthy recommendation was adopted by ICCAT in 2004, serving as the world's first international prohibition on shark finning (more in Chapters 2.4. and 3.2.1).¹⁴⁸ The prohibition of shark finning can be implemented through various approaches, such as 'fin to carcass ratios' or enforcing a complete ban that requires sharks to be landed with their 'fins naturally attached.'¹⁴⁹ The first method is applied by ICCAT, stipulating in its recommendation that 'CPCs shall require their vessels not to have onboard fins that total more than 5% of the weight of sharks onboard, up to the first point of landing.'¹⁵⁰ The negative aspects of this regulation are further elaborated in Chapter 4.3. Moreover, a year prior to the shark finning regulation, ICCAT made a resolution strengthening the implementation of IPOA-Sharks and requiring contracting parties to develop and implement National Plans of Action (NPOA)¹⁵¹ regarding their shark stocks.¹⁵² The recommendation banning shark finning and requiring the CPCs to adopt NPOAs represents significant milestones in global shark conservation efforts. By requiring the implementation of NPOAs, ICCAT strengthened its governance framework, ensuring that nations take concrete steps in the conservation of shark species within their jurisdictions. The recommendations of ICCAT with general CMMs encouraging the management of sharks are followed by recommendations entailing species-specific measures.

¹⁴⁵ See ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12.

¹⁴⁶ ICCAT Recommendation 19-06, BYC.

¹⁴⁷ IPOA-Sharks 5.10.

¹⁴⁸ ICCAT Recommendation 04-10, BYC; JE Techera and N Klein, n 1, p 168.

The first one to implement fins-attached-policy was actually NEAFC. See Scientific, Technical and Economic Committee for Fisheries, Alvaro JA et al 'Review of the implementation of the shark finning regulation and assessment of the impact of the 2009 European Community Action Plan for the Conservation and Management of Sharks' (2019) STECF-19-17.

¹⁴⁹ Hammerschlag N, Shiffman SD, 'Shark conservation and management policy: a review and primer for non-specialists' (2016) 19 *Animal Conservation*, p 5.

¹⁵⁰ ICCAT Recommendation 04-10, BYC.

¹⁵¹ NPOAs contribute to the efficient management of sharks within different jurisdictions, enhancing international cooperation and coordination of shark management plans. See IPOA-Sharks Annex I, Art 5.

¹⁵² ICCAT Resolution 03:10, BYC.

Assumingly, ICCAT recognised the vulnerability of shortfin makos and the negative impacts of fishing.

The initial shortfin mako-specific recommendation introduced by ICCAT had a general focus, encouraging CPCs to decrease shortfin mako mortality while gathering scientific data.¹⁵³ The provision in the recommendation stipulates that ‘CPCs shall take appropriate measures to reduce fishing mortality in fisheries targeting /.../ North Atlantic shortfin mako sharks (*Isurus oxyrinchus*).’¹⁵⁴ The adoption of this recommendation by ICCAT can be viewed as a significant step towards advancing the conservation efforts targeted at safeguarding the shortfin makos. However, these recommendations lacked specific actions to be taken by CPCs in order to reduce shortfin mako mortality effectively.¹⁵⁵

Moving to the following species-specific recommendations from 2017 and 2019, it becomes evident that they share identical objectives and measures. Both recommendations address the prompt release of shortfin makos with the purpose of reducing their mortality, which is the first step in developing a rebuilding program of shortfin mako stocks.¹⁵⁶ The recommendations provide that CPCs ‘shall require vessels flying their flag to promptly release North Atlantic shortfin mako in a manner that causes the least harm while giving due consideration to the safety of crew members.’¹⁵⁷ According to the shortfin mako stock assessment report, the release can be a potentially effective measure to reduce the mortality of stocks due to the post-release survival of individuals with a probability of 70%.¹⁵⁸ The measure requiring to reduce mortality of shortfin makos, therefore, contributes to the precautionary principle by attempting to keep the stocks within sustainable levels¹⁵⁹ and aligns with the requirement to restore depleted populations according to the UNCLOS and the FAO Code of Conduct.¹⁶⁰ Additionally, the

¹⁵³ ICCAT Recommendation 07-06, BYC.

¹⁵⁴ *Ibid*

¹⁵⁵ *Ibid*; ICCAT Recommendation 10-06, BYC; ICCAT Recommendation 13-10, BYC; ICCAT Recommendation 14-06, BYC;

¹⁵⁶ ICCAT Recommendation 19-06, BYC; ICCAT Recommendation 17-08, BYC.

¹⁵⁷ *Ibid*.

¹⁵⁸ ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12, p 12; ICCAT/SRDGP, Report of the Shark Research and Data Collection Programme. *Activity report for the period October 2021 - September 2022* (2022), available at: https://www.iccat.int/Documents/Meetings/Docs/2022/REPORTS/2022_SCRS_ENG.pdf, Appendix 9, p 276.

¹⁵⁹ IPOA-Sharks, Art. 1.2.

¹⁶⁰ IPOA-Sharks, Art. 5.5.

recommendations entail specific requirements for reporting biological data on the individual dead shortfin makos as well as on discards and live releases.¹⁶¹

However, the requirement of prompt release included in the recommendations under the view is not absolute and is subject to CPCs domestic laws – the capture, retention on board, transshipment, or landing of shortfin makos is contingent upon fulfilling specific length criteria for individual sharks (180 cm fork length for males and 210 cm fork length for females).¹⁶² This means retaining the shortfin makos is only allowed if they are a certain size. Importantly, this approach recognises that the sharks' size matters for its management, and releasing juvenile sharks is considered a priority measure within the RFMO. Further, any bycatches of dead sharks may be landed ‘provided that the fishermen may not draw any profit from such fish.’¹⁶³ This requirement can be interpreted as a reinforcement of ICCAT’s dedication to sustainable fishing practices and an attempt to restrict trade.

In its most recent recommendation as of 2021 concerning the conservation of shortfin makos and the ongoing endeavours within the stock rebuilding program, the fundamental rule on releasing incidental catches of shortfin makos remains consistent.¹⁶⁴ Nonetheless, this recommendation introduces a heightened level of specificity, delineating more stringent regulations concerning the retention of shortfin mako sharks caught in association with ICCAT fisheries in 2022 and 2023 and stating that ‘CPCs shall implement a prohibition on retaining on board, transshipping and landing, whole or in part, North Atlantic shortfin mako caught in association with ICCAT fisheries in 2022 and 2023 as a first step in rebuilding the stock.’¹⁶⁵

The stocks rebuilding programme objective is ‘to support maximum sustainable yield (MSY) by 2070 with a probability of a range of between 60 and 70% at least’ and to maintain the mortality of stocks at sustainable levels. The objective is to be reached by the first step in rebuilding the stock, entailing that the ‘the total fishing mortality for North Atlantic shortfin mako shall be no more than 250 tonnes until new SCRS advice is provided to the Commission.’ The requirement aligns with the management recommendation in IPOA-Sharks, stating that

¹⁶¹ ICCAT Recommendation 19-06, BYC.

¹⁶² The fork length (size) of the sharks affects the post-release mortality – larger sharks are assumed to have lower post-release mortality rates. See ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12, p 1.

¹⁶³ ICCAT Recommendation 19-06, BYC.

¹⁶⁴ ICCAT Recommendation 21-09, BYC.

¹⁶⁵ *Ibid.*

‘managing shark resources for sustainable use involves controlling fishing mortality through limiting fishing effort and/or catch.’¹⁶⁶ Fishing mortality refers to the proportion of the fish available to be removed by fishing in a small unit of time.¹⁶⁷ The definition ‘total fishing mortality’ has not been used in the previous recommendations or in the 2019 stock assessment by the shark species group, which essentially recommended establishing a TAC with less than 300 t for achieving the shortfin mako stock recovery by the year 2070 with a 60%.¹⁶⁸ Hence, the recommendation sets forth that the bycatch (not including released living fish) of shortfin makos by fishing vessels is limited to a weight of up to 250 t in 2021 and 2022.

The recommendation also outlines that the potential for future permissible retention of shortfin makos will be evaluated throughout 2022 and 2023. Already for 2023 and on an annual basis thereafter, the CPCs are entitled to retain shortfin makos pursuant to the designated calculation method provided in Annex 1 to the recommendation (catch quotas allocation, but only if the dead bycatch retention allowance is greater than zero).¹⁶⁹ The retention allowance is calculated pursuant to the following formula:

‘Individual CPC retention allowance (t) = (CPC average annual catches from 2013-2016) x (Retention Allowance) / Average total ICCAT catches from 2013-2016.’¹⁷⁰

This recommendation, therefore, provides room for retention of shortfin makos starting from 2023. However, it also sets out additional requirements for the retention allowance. Specifically, only fish dead on haulback could be retained with a limit of no more than one specimen for any fishing trip on vessels of 12 meters or less. However, there are no limitations on the retention of shortfin makos to bigger vessels. Moreover, the limitation does not apply to the full extent to Norway and Iceland, provided that these States have adopted domestic laws prohibiting direct fishing, finning and gaining commercial value from sharks caught dead on haulback.¹⁷¹ This approach reflects ICCAT's attempt to balance conservation goals with practical fisheries management considerations. Moreover, the recommendations show the

¹⁶⁶ IPOA-Sharks, Art 3.

¹⁶⁷ FAO. Glossary. Fishing Mortality. Available at: <http://www.fao.org/fi/glossary/default.asp> (accessed on 28.08.2023).

¹⁶⁸ ICCAT, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting: Madrid, Spain 20-24 May 2019 (2019), n 12.

¹⁶⁹ ICCAT Recommendation 21-09, BYC.

¹⁷⁰ *Ibid.*

¹⁷¹ *Ibid.*

organisation's dedication to sustainable fisheries while acknowledging the different laws and situations that affect how these measures are applied. This is also supported by the statement prohibiting the transshipment of shortfin makos in whole or in part, enhancing conservation efforts included in CITES Annex II (refer to Chapter 2.4).

The potential concern arises from the fact that allowing retention from 2023 onwards could potentially lead to increased fishing pressure on the shortfin mako population. If CPCs are granted the ability to retain shortfin makos starting in 2023, it undermines the retention ban and might encourage higher harvesting of shortfin makos, which could counteract the conservation efforts made during the preceding years. This situation could hamper the intended goal of rebuilding the shortfin mako stock and might not lead to the desired recovery outcomes.

In order to ensure the safety and survivability of shortfin makos, CPCs are additionally required to adopt 'the minimum standards for safe handling and release procedures of shortfin makos caught as bycatch.'¹⁷² For instance, the minimum standards require the fishing vessel crew to 'not lift sharks from the water using the branchline, especially if hooked unless it is necessary to lift sharks for species identification.'¹⁷³

ICCAT is also encouraging CPCs to contribute to the knowledge base of scientific data by collecting the biological data and samples of shortfin makos dead at haulback, research on *inter alia* mating pupping and nursery grounds, as well as at-vessel and post-release mortality of shortfin makos incorporating tagging measures.¹⁷⁴ Further, CPCs are required to launch a pilot project on data loggers to understand better the effect 'of the soaking time, fishing depths and environmental characteristics underpinning higher incidental catches of' shortfin makos.¹⁷⁵ These regulations underscore ICCAT's commitment to refining its measures over time and fostering a dynamic regulatory framework to ensure the sustainable management of shortfin mako populations. The growing concerns and efficiency of the ICCAT are further underlined by the fact that the SCRS has an obligation to provide updated advice in 2024 on 'mitigation

¹⁷² ICCAT Recommendation 21-09, BYC.

¹⁷³ *Ibid.*

¹⁷⁴ *Ibid.*

¹⁷⁵ *Ibid.*

measures to reduce shortfin mako mortality.’¹⁷⁶ Benchmark stock assessment shall be conducted by the SCRS by 2024.¹⁷⁷

In addition to the bycatch mitigation measures regulating the size limits and catch-quotas, finning, monitoring and reporting, and specific handling measures, the ICCAT has been evaluating measures concerning fishing gear. For instance, using circle hooks instead of J hooks to reduce the mortality of shortfin makos.¹⁷⁸ However, the evaluation revealed that the conclusions on using specific gear types were inconclusive,¹⁷⁹ which is essentially the reason for not adopting measures concerning the gear type. It is worth mentioning that ICCAT has also suggested that CPCs should implement time and area closures.¹⁸⁰ However, it is important to emphasise that ICCAT has not directly enforced specific area restrictions. Instead, it has recommended that CPCs take on the responsibility of implementing these restrictions within their respective jurisdictions. However, relying on CPCs to implement these measures could lead to delays or inadequate action, mainly if there is a lack of political will or conflicting interests within certain jurisdictions.¹⁸¹

Based on the recommendations adopted by ICCAT, it becomes evident that the organisation has enhanced and refined its measures to govern the conservation and management of shortfin makos over time. The first shortfin mako-specific recommendation contained requirements only on data reporting,¹⁸² while the latest established stricter regulation on no-retention.¹⁸³ In conclusion, the CMMs implemented by ICCAT, which can possibly positively affect the population of shortfin makos, include mainly measures minimising bycatch. Nonetheless, the effectiveness of these measures remains uncertain at the time of writing of this thesis, and their impact on shortfin makos will become evident in forthcoming scientific evaluations of the stocks.

¹⁷⁶ ICCAT Recommendation 21-09, BYC.

¹⁷⁷ *Ibid.*

¹⁷⁸ ICCAT Recommendation 17-08, BYC; ICCAT, ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12, p 14.

¹⁷⁹ ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12, p 10.

¹⁸⁰ ICCAT Recommendation 21-09, BYC.

¹⁸¹ Harrison J, ‘Key Challenges Relating to the Governance of Regional Fisheries’ in Caddell R and Molenaar EJ (eds.) *Strengthening International Fisheries Law on an Era of Changing Oceans* (Hart Publishing Oxford 2019), pp 86-87 and 98.

¹⁸² ICCAT Recommendation 14-06, BYC.

¹⁸³ ICCAT Recommendation 21-09, BYC.

3.2.2 NAFO

The North Atlantic Fisheries Organisation (NAFO) was the first to address shark conservation and management by adopting a catch limit in 2004.¹⁸⁴ The CMMs adopted by NAFO are outlined in a single publication known as the ‘Conservation and Enforcement Measures’ (CEM), which is revised by NAFO on an annual basis.¹⁸⁵ As the title suggests, the CEM establishes both conservation and enforcement measures, entailing general and species-specific measures, such as annual catch quotas, fish sizes and allocation schemes, protection of vulnerable marine ecosystems, vessel requirements, monitoring, and inspection.¹⁸⁶ The measures detailing the requirements for contracting parties in respect of shark conservation are stipulated under Article 12 of the CEM. This provision is equally applicable to shortfin makos, given that they are species within the jurisdiction of the NAFO Convention area together with other highly migratory species listed in Annex I of UNCLOS.¹⁸⁷

Firstly, the contracting parties are required to report data on sharks in accordance with relevant procedures set out in Article 28. Similarly to ICCAT, the regulations also prohibit the removal of shark fins,¹⁸⁸ supplemented by a provision prohibiting ‘the retention on/board, transshipment and landing of shark fins fully detached from a carcass.’¹⁸⁹ However, NAFO has adopted the ‘fins naturally attached’ approach, eliminating the need for determining a ‘fin to carcass’ ratio and thereby enhancing the efficiency of the regulation.¹⁹⁰ The prompt release of living sharks is encouraged under Article 12(4), stating that ‘in fisheries that are not directed at sharks, each Contracting Party shall encourage every vessel entitled to fly its flag to release sharks alive, and especially juveniles, that are not intended for use as food or subsistence.’ The particular provision lacks robustness, as it is open to interpretation by flag States and does not offer strong protection for shortfin makos, especially considering that their fins are commonly used for food. Lastly, CEM requires contracting parties to conduct research on fishing gear and on ‘key biological and ecological parameters, life-history, behavioural traits and migration patterns, as well as on the identification of potential mapping, pupping and nursery grounds of key shark

¹⁸⁴ JE Techera and N Klein, n 1, p 14.

¹⁸⁵ NAFO Conservation and Enforcement Measures.

¹⁸⁶ *Ibid.*

¹⁸⁷ NAFO Convention Art I(f)(ii).

¹⁸⁸ NAFO Conservation and Enforcement Measures, Art 12(1)(b).

¹⁸⁹ NAFO Conservation and Enforcement Measures, Art 12(1)(c).

¹⁹⁰ Hammerschlag N, Shiffman SD, n 144, p 5.

species.¹⁹¹ Hence, the life-history parameters can be identified by researching the ecological and biological parameters of sharks.¹⁹²

Noteworthy is that CEM places particular emphasis on Greenland sharks, prohibiting its targeted fishery and requiring the vessels flying the flags of contracting parties 'to undertake all reasonable efforts to minimise incidental catch and mortality and, where alive, release Greenland sharks in a manner that causes the least possible harm.'¹⁹³ The Greenland sharks are under the protection of NAFO due to their delayed maturity and low fecundity, as well as their "Near Threatened" status in the IUCN Red List Shark Specialist Group.¹⁹⁴ Moreover, their habitat near the coast of Greenland falls under the direct jurisdiction of NAFO, and bycatches were highest in Greenland halibut bottom trawl fisheries.¹⁹⁵ The lack of accurate data on catches and discards supports the inclusion of Greenland sharks in the CEM.¹⁹⁶

As discussed in Chapter 3.1, one of the relevant CMMs for shark conservation is the designation of area closures or other restrictions on fishing in particular areas. NAFO has implemented area restrictions for bottom fishing activities in respect of vulnerable marine ecosystems under Article 17 of CEM. Area restrictions are relevant regarding trawling activities – pulled by single or double vessels, trawl nets traverse the seafloor or midwaters, leading to substantial unintentional catch and mortality of diverse shark species. Trawlers, designed for catching small pelagic creatures with their vertically opening nets, may incidentally capture pelagic sharks, including shortfin makos and other species' in noteworthy quantities.¹⁹⁷ While NAFO has implemented area restrictions such as seamount and coral area closures, these measures are not explicitly designed for the direct conservation of sharks.¹⁹⁸

¹⁹¹ NAFO Conservation and Enforcement Measures, Art 12(5).

¹⁹² Shark-IPOA, Art 5.8.

¹⁹³ NAFO Conservation and Enforcement Measures, Art 12(1)(d) and (e).

¹⁹⁴ NAFO SCS, Report of the Scientific Council, (2018) 18/19, available at: <https://www.nafo.int/Portals/0/PDFs/sc/2018/scs18-19.pdf>, p 58

¹⁹⁵ NAFO, Annual Fisheries and Compliance Review, *Compliance Report for Fishing Year 2021 (2022)* 22-18, available at: <https://www.nafo.int/Portals/0/PDFs/COM/2022/comdoc22-18.pdf>, p 9; NAFO, Meeting Proceedings of the Commission, *1 September 2020–31 August 2021 (2022)* 2521-7623, available at: <https://www.nafo.int/Portals/0/PDFs/mp/2021-2022/MP-2021-2022.pdf>, p 70.

¹⁹⁶ NAFO, Report of the Scientific Council, *01-14 June 20-18 (2018)* 18/19, available at: <https://www.nafo.int/Portals/0/PDFs/sc/2018/scs18-19.pdf>, p 56.

¹⁹⁷ *Ibid*, p 58

¹⁹⁸ Sacchi, J. 2021. *Overview of mitigation measures to reduce the incidental catch of vulnerable species in fisheries*. Studies and Reviews No. 100 (General Fisheries Commission for the Mediterranean). Rome, FAO, pp 7-8.

¹⁹⁹ NAFO Conservation and Enforcement Measures, Chapter II.

3.2.3 NEAFC

NEAFC's focus on shark regulations primarily involves the prohibition of targeted fishing for specific shark species.¹⁹⁹ The general measures of NEAFC include the prohibition of shark finning, the requirement to report data for catches of sharks, conduct research on key shark species and gear and the release of live sharks in the exact wording as provided by NAFO.²⁰⁰ Separate shark species such as porbeagle, basking shark, and specific deepsea sharks (in total 17 species) appear in the NEAFC's recommendations both as targeted and non-targeted species, prohibiting the contracting parties the direct fishing of those species and requiring the prompt release of each individual when caught as bycatch.²⁰¹

Additionally, NEAFC has greatly contributed to the area restriction measures in the Northeast Atlantic by addressing the 'significant adverse impacts of bottom fishing on vulnerable marine ecosystems.'²⁰² In protecting vulnerable marine ecosystems, NEAFC actively contributes to the application of the ecosystem approach to fisheries management and the preservation of marine biodiversity by mitigating adverse impacts on vulnerable marine ecosystems. NEAFC contributes to the conservation of deep-water sharks listed in the scope of its measures, as these species are negatively affected, particularly by bottom fishing.²⁰³ Implementation of limitations on bottom fishing holds the potential to provide benefits not just to the species falling within NEAFC's jurisdiction²⁰⁴ but also to other species found in deep waters, including shortfin makos (the scientific data gathered on shortfin makos indicates that the depth range where shortfin makos have been found swimming could reach down to 979,5 m).²⁰⁵ This approach underscores NEAFC's dedication to fostering sustainable fisheries practices, mitigating negative ecological impacts, and promoting the holistic protection of marine ecosystems and their diverse inhabitants.

¹⁹⁹ ICCAT, Report of the Independent Performance Review of ICCAT, n 106, p 70.

²⁰⁰ NEAFC Recommendation 10:2015.

²⁰¹ NEAFC Recommendation 7:2020; NEAFC Rec. 8:2020; NEAFC Recommendation 9:2020.

²⁰² NEAFC, Recommendation 19:2014.

²⁰³ Asgeirsson MH and Campbell D, 'Illegal, Unreported, and Unregulated Fishing: How the North-East Atlantic Fisheries Commission Addresses the IUU Fishing Challenge – Is It Working?' (2020) 34 *Ocean Yearbook*, p 377

²⁰⁴ According to ICES, deep-water fisheries are deeper than 400 m. See Clarke M, Patterson K, Deep-sea fisheries management: the approach taken by the European Union' (2005) *FAO*, p 2

²⁰⁵ Carlson J et al, n 84, p 6.

The above examination of the selected RFMOs reveals the diversity in the CMMs established for the protection of sharks. The CMMs adopted by RFMOs are summarised in the below table:

Table 1. Shortfin Mako Shark Conservation Measures Adopted by ICCAT, NAFO and NEAFC.

	ICCAT ²⁰⁶	NAFO ²⁰⁷	NEAFC ²⁰⁸
Finning ban	Body-to-carcass ratio	Fins landed naturally attached	Fins landed naturally attached
Prompt release	Prompt release and no retention obligation	–	–
Transshipment	Prohibited	–	–
Total allowable retention	Total fishing mortality 250 t; allocation of quotas.	–	–
Minimising bycatches and mortality	Retention and landing ban	–	Encouraged
Research	Mating, pupping, nursery grounds, options for spatial-temporal measures, mitigation measures (gear, deployment), at-vessel and post-release mortality, hook-timers, satellite tagging, and installation of data loggers.	Gear, key biological and ecological parameters, life history, behavioural traits and migration patterns, mapping, pupping and nursery grounds	Gear, biological/ecological parameters, life history, behavioural traits, migration patterns, potential mating, pupping and nursery grounds
Reporting	Catches, landings, dead discards and live releases.	Catches, historical data	Catches, estimates of discards (dead and alive) and size frequencies
Safe handling and release	Minimum standards for handling	–	–

Notably, ICCAT has undertaken specific actions to address the conservation of shortfin makos. In contrast, NAFO and NEAFC have not taken comparable steps to focus on the shortfin mako's

²⁰⁶ ICCAT Recommendation 21-09, BYC.

²⁰⁷ NAFO Conservation and Enforcement Measures, Art 12.

²⁰⁸ NEAFC Recommendation 10:2015.

conservation within their frameworks. At the same time, while reports show that the populations of shortfin makos continue to decline despite the continuing efforts of RFMOs, the scientific community raises concerns about the effective enforcement of the measures by the RFMOs.²⁰⁹

3.3 Enforcement of Conservation and Management Measures

Ensuring compliance with the RFMOs regulations by flag States is critical for effectively conserving targeted shark species and bycatch.²¹⁰ Moreover, effective compliance with regulations prevents excessive fishing pressure, allowing populations to recover and ensuring the species' long-term survival.²¹¹ One of the key challenges for RFMOs in terms of compliance and enforcement is known to be illegal, unreported and unregulated fishing. In respect of sharks, illegal fishing means any fishing activities that are conducted in violation of regulations related to practices such as finning.²¹² Further, unreported fishing pertains to misreporting or not reporting fishing activities contrary to the reporting procedures of RFMOs, and unregulated fishing refers to fishing practices that do not align with the requirements of RFMOs.²¹³

In the EEZ, the coastal States are responsible for actively taking measures to prevent, deter and eliminate IUU fishing.²¹⁴ At the same time, on the high seas, the control is limited to state authorities over the vessels flying State flags.²¹⁵ As discussed in Chapter 2.2, UNCLOS provides for a number of measures regarding flag States' enforcement of regulations on the high seas, including boarding and inspecting of vessels and port state measures, though the role of RFMOs in setting additional and more comprehensive requirements to ensure compliance is vital. The main measures implemented by RFMOs with the objective of ensuring compliance with their regulations are monitoring, control and surveillance (MCS), entailing vessel monitoring systems (VMS) and observer programmes. Additionally, the usual practice is to establish measures addressing the transshipment and landing of catches and other trade- and

²⁰⁹ Marel van der RE, 'Problems and Progress in Combating IUU Fishing,' n 174, p 318.

²¹⁰ JE Techera and N Klein, n 1, p 181.

²¹¹ Anderson D et al, Recommended best practices for RFMOs. Report of an independent panel to develop a model for improved governance by Regional Fisheries Management Organization (Chatham House London 2007), p 44.

²¹² JE Techera and N Klein, n 1, pp 182-183.

²¹³ *Ibid*, p 183.

²¹⁴ SRFC Advisory opinion, n 56, par. 106.

²¹⁵ UNCLOS, Art 94(1).

market-related measures. For members violating the regulations, RFMOs have adopted specific procedures that usually require the members to conduct follow-up actions and reporting.²¹⁶

The three RFMOs in this study have established different bodies, programs and schemes concerning compliance matters. ICCAT, for instance, has two bodies overseeing the compliance questions: the Conservation and Management Measures Compliance Committee and the Permanent Working Group on ICCAT Statistics and Conservation Measures.²¹⁷ Particularly important are the compliance measures taken by ICCAT, as it is the only RFMO in the Northern Atlantic Ocean to have introduced species-specific measures aimed at conserving and managing shortfin mako stocks.

One of the first requirements in the scope of MCS adopted by ICCAT is the obligation of CPCs to provide ICCAT with information on their vessels' shark catches, effort by gear type, landing and trade of shark products.²¹⁸ This requirement allows the organisation to intensify its monitoring of shark catches, also ensuring adherence to the regulation requiring sharks to be landed with fins attached when the fin-to-carcass ratio reaches 5%. The data shall be submitted to ICCAT in the shark check sheet covering how each CPC complies with the CMMs established by ICCAT, including reducing the mortality of shortfin makos and compliance with the measures relating to the bans of finning practices.²¹⁹ Moreover, ICCAT's recent recommendation from 2021 on the conservation of shortfin makos introduces an expanded reporting checklist to provide greater detail specifics on shortfin makos' live releases, post-release mortality, size and number of landings. The reporting helps to ensure that the shortfin makos are being caught in compliance with the established measures and that the total allowable retention is adhered to by the CPCs.

The reporting is further strengthened by the requirement of implementing vessel monitoring systems, entailing getting authorisation for fishing and implementation of VMS, and establishment of observation and inspection programs.²²⁰ The shortfin makos are highly migratory, travelling across multiple maritime zones and through high seas. Therefore, flag

²¹⁶ Anderson D et al, n 204, p 33.

²¹⁷ ICCAT Secretariat, 'ICCAT Manual. 1.1. What is ICCAT,' available at: <https://www.iccat.int/Documents/SCRS/Manual/CH1/CH1-ENG.pdf>, p 2.

²¹⁸ ICCAT Recommendation 03-10, BYC.

²¹⁹ ICCAT Recommendation 18-06, BYC.

²²⁰ ICCAT, Recommendation 02-31, GEN.

state control is particularly important for the collection of the missing data on the sharks. Observer programmes ‘are used at both the national and RFMOs level for the purposes of collecting scientific data.’²²¹ Observers are required *inter alia* to collect data on sharks’ discards and bycatch, fishing operations, and the use of bycatch mitigation measures.²²² ICCAT requires the CPCs to ensure 5% observer coverage within their observer programs on national levels for purse seine, pelagic longline, baitboat, gillnet and trawl fisheries.²²³ In respect of shortfin makos, the ICCAT has recommended that CPCs endeavour to increase the observer coverage to 10% and thus increase the compliance of fishing vessels to measures entailed in the shortfin makos latest recommendation from 2021.²²⁴

The most effective measures, however, might be the inspection of vessels and port state control, where the IUU fishing is detected by a third party carrying out the responsibilities. ICCAT’s Scheme of Joint International Inspection establishes rules for the inspection of vessels on the sea, which allows for appointed inspectors to examine the characteristics of catches of shortfin makos, e.g. the size of individuals, the total retained catch of the species as well as whether the fins are attached.²²⁵

Port state measures encompass a range of actions taken by port States to regulate fishing vessel activities. These measures include denying entry to vessels involved in IUU fishing, conducting port inspections, and monitoring the transportation of ICCAT-managed species.²²⁶ To ensure that IUU fishing is not being conducted and to prevent possible IUU fishing in the future, port States should designate specific ports through which vessels engaged in fishing and transshipment must seek authorisation for entry. This designation allows port States to exercise control over vessel activities and conduct inspections to verify compliance with ICCAT regulations. Moreover, ‘CPCs shall inspect at least 5% of landing and transshipment operations in their designated ports,’ according to specific inspection procedures.²²⁷ In short, the inspection procedure involves thorough assessments of catch documentation, fishing gear and other data

²²¹ ICCAT Recommendation 16-14, GEN.

²²² *Ibid.*

²²³ *Ibid.*

²²⁴ ICCAT Recommendation 21-09, BYC.

²²⁵ ICCAT Recommendation 75-02, GEN.

²²⁶ ICCAT Recommendation 18-09, GEN.

²²⁷ *Ibid.*

related to shortfin mako shark fishing. This process also helps to verify compliance with catch limits, size restrictions, and other relevant conservation measures.

ICCAT has also established comprehensive measures for landings and transshipments of catch,²²⁸ stating that transshipments and landing of all fish from vessels of non-contracting parties are prohibited without prior inspections of *inter alia* vessel's documents and catch on board unless the vessel can establish 'that the fish were caught outside the convention area.'²²⁹ Further compliance by non-contracting parties (and also by CPCs) is ensured by the 'vessel sightings' requirement setting out the obligation for CPCs to notify any sighted IUU fishing activities to authorities under whose jurisdiction sighted vessels fly their flags and to board and inspect the vessel. Moreover, for any fishing activities, whether they are legal or not, 'CPCs are encouraged, upon the consent of the flag State, to board and inspect vessels of non-CPCs conducting fishing or fishing-related activities for tuna and tuna-like species and other species caught in association with these species, in waters of the Convention Area beyond national jurisdiction.'²³⁰ This is important in ensuring compliance of non-contracting States in respect of shortfin mako catches as IUU fishing remains one of the most challenging issues to fisheries.

To ensure that the infringements will not take further place, the ICCAT has implemented schemes for penalties and follow-ups. For instance, the organisation publishes 'a list of vessels presumed to have carried out' IUU fishing²³¹ and has in place a schedule of actions to improve compliance and cooperation. The schedule sets out the possible actions that can be taken in case of infringement of CMMs, reporting and MCS measures. Based on the severity, it could be a reduction in quotas, enhanced reporting requirements, bycatch retention limits, time and/or area restrictions, or individual vessel quotas.²³² In respect of shortfin makos, ICCAT stipulates that CPCs failing to comply with the obligation of reporting shortfin mako catch data while permitting their vessels to retain and land the species will be required to instruct their fishing vessels to refrain from retaining any shortfin makos until the relevant data is submitted.

²²⁸ The regulation of transshipment has gained significance as a critical instrument in combating IUU fishing and in ensuring accurate data collection and verification. Many IUU operators opt for at-sea transshipment to evade detection, effectively minimising their exposure. This involves transferring catches to cargo vessels (reefers) to avoid port entry for offloading. Additionally, IUU-caught fish are often mixed with legally caught ones, thus concealing their origins. Furthermore, reefers often transport fish from the RFMO area of harvest to ports belonging to non-members of the respective RFMO. See Anderson D et al, n 204, p 52.

²²⁹ ICCAT Recommendation 98-11, GEN; ICCAT Recommendation 21-15, GEN.

²³⁰ ICCAT Recommendation 19-09, GEN.

²³¹ ICCAT Recommendation 21-13, GEN.

²³² ICCAT Recommendation 16-17, GEN.

Furthermore, if CPCs do not adhere to the retention allowance, the subsequent year's allowance will be reduced by an amount equivalent to the excess catch.²³³

Both NAFO and NEAFC have implemented measures similar to those of the ICCAT, though considering that the two organisations do not have species-specific measures in place, their role in contribution to the overall conservation of shortfin makos is assumingly smaller. NEAFC Scheme of Control and Enforcement²³⁴ is the primary document establishing the enforcement mechanisms for fishing vessels within the NEAFC regulatory area. The scheme entails, similarly to ICCAT, control measures, monitoring, inspections, and port state control. *Inter alia*, the vessels engaged in shark fisheries in the NEAFC Convention area are required to record catch and fishing efforts on sharks,²³⁵ hence contributing to the scientific data. To ensure compliance with the finning ban, the contracting parties of NEAFC are authorised to implement all the necessary measures, such as monitoring, inspections and port state control.²³⁶

The enforcement and compliance measures implemented by NAFO do not substantially differ from those of NEAFC. NAFO's established mechanisms for compliance and enforcement are outlined within their CEM framework. This framework includes various components encompassing monitoring, observer scheme, at-sea inspection and surveillance scheme, port state control and non-contracting party scheme.²³⁷ Nonetheless, it is worth noting that NAFO has established joint measures with NEAFC to combat IUU fishing by exchanging data on violating vessels.²³⁸

The subsequent section will explore the stakeholder engagement in the operations of RFMOs and the collaboration between RFMOs and other relevant parties. This analysis will delve into the interactions, roles, and impacts of various stakeholders within RFMO frameworks, detailing how cooperation and engagement may contribute to the effective conservation of shortfin makos.

²³³ ICCAT Recommendation 21-09, BYC.

²³⁴ NEAFC Scheme of Control and Enforcement. Available online: <https://www.neafc.org/scheme/contents> (accessed on 14.08.2023)

²³⁵ *Ibid*, Annex IV; NEAFC Recommendation 10:2015.

²³⁶ *Ibid*, Articles 1(c) and 2.

²³⁷ NAFO Conservation and Enforcement Measures, Chapters IV-VIII.

²³⁸ Harrison J, 'Key Regional Fisheries Governance Challenges,' n 174, p 98.

3.4 Stakeholder Engagement and Cooperation

The engagement and cooperation of various stakeholders are pivotal factors that can shape the effectiveness and success of adopted measures. RFMOs play a crucial role in fostering collaboration among diverse stakeholders to achieve sustainable fisheries practices and ensure the long-term health of marine ecosystems. Moreover, the harmonization of CMMs between RFMOs themselves is important in the collective effort to combat overfishing and ensure the sustainability of species. Relying solely on the implementation of measures within an area of a single RFMO is inadequate in fostering sustainable fisheries of highly migratory species such as shortfin makos. Moreover, given the migratory behaviour of shortfin makos, which extends across the maritime jurisdictions of multiple coastal States and the high seas, the successful conservation and management of these transboundary fish stocks heavily relies on the cooperation between the involved coastal States and high-seas fishing nations.²³⁹

ICCAT has launched a Shark Research and Data Collection Programme (SRDCP) ‘focused on the reduction of the main sources of uncertainty in the formulation of scientific advice, including the improvement of data collection and reporting procedures.’²⁴⁰ The SRDCP conducts various activities and, among them, studies on the shortfin mako in the Atlantic Ocean, where the organisation have included scientists from various coastal countries such as the EU, Portugal, United States, Uruguay, Japan, Namibia, and Brazil.²⁴¹ Moreover, other stakeholders, such as observers from the Portuguese Institute for Sea and Atmosphere and the National Oceanic and Atmospheric Administration, were included in the studies of the post-release mortality of shortfin makos.²⁴² NAFO and NEAFC, on the contrary, have not adopted similar initiatives.

Considering that most shortfin makos are landed by EU contracting parties,²⁴³ it is safe to assume that cooperation and collaboration between the RFMOs and the EU is vital for ensuring

²³⁹ It is important to highlight that ITLOS has underlined the necessity of seeking cooperation from not only the contracting parties of an RFMO but also from other relevant States that share the same fish stocks, either directly or through appropriate international organisations. This cooperation is vital to ensure the effectiveness of conservation and sustainable management measures for these stocks, throughout their entire geographic distribution or migrating area. See SRFC Advisory opinion, n 56, par-s. 215 and 218.

²⁴⁰ ICCAT Shark Species Group, Inter-Sessional Meeting of the Sharks Species Group (2013) available at: https://www.iccat.int/Documents/Meetings/Docs/2013_SHK_INTER-SESS_ENG.pdf, p 24.

²⁴¹ ICCAT/SRDCP, Report of the Shark Research and Data Collection Programme, n 153, p 274.

²⁴² *Ibid*, p 276.

²⁴³ The European Union (EU) fleet is responsible for the majority of shortfin mako catches in the North Atlantic, with Spanish vessels leading in landing figures, closely followed by Portuguese boats. Vessels flagged to the USA

the conservation of shortfin makos. Based on the EU proposals and policy regarding shark finning, all RFMOs in this study have implemented either fins naturally attached policies or a 5% fin-to-carcass ratio policy.²⁴⁴ Notably, the EU has implemented Regulation (EU) 2019/833,²⁴⁵ providing regulations applicable to the EU fishing vessels in the NAFO Convention area, including monitoring, observer programme, inspection and surveillance.²⁴⁶ Moreover, similar regulations were adopted in respect of the ICCAT Convention area.²⁴⁷ European Fisheries Control Agency has also established cooperation with ICCAT, NAFO and NEAFC, particularly with respect to inspection and control measures and compliance of EU vessels with CMMs adopted by the RFMOs.²⁴⁸ As a result, collaborating with the EU broadens the range of applicability of RFMO measures, extending their application to a more inclusive array of States.

In 2008, NEAFC and the OSPAR Commission (Commission for the Protection of the Marine Environment in the North-East Atlantic) entered into a Memorandum of Understanding. The purpose of this MoU was to enhance collaborative efforts aimed at conserving and sustainably utilizing marine biological diversity in the North-East Atlantic region, which includes safeguarding marine ecosystems.²⁴⁹ Together, the organisations are able to promote their regions and contribute to shark conservation measures by involving other stakeholders and establishing marine protected areas.²⁵⁰

ICCAT has established a cooperation with FAO with regard to the study of the status of stocks and bycatches of shark species. According to the resolution, FAO serves as a coordinator among

contribute to approximately 9% of the North Atlantic catches. See ICCAT, ICCAT Secretariat, Report for Biennial Period 2018–19, n 5.

²⁴⁴ Council Regulation (EU) on the removal of fins of sharks on board vessels, No 605/2013, 29 June 2013.

²⁴⁵ Council Regulation (EU) laying down conservation and enforcement measures applicable in the Regulatory Area of the Northwest Atlantic Fisheries Organisation, No 2019/833, 20 May 2019.

²⁴⁶ *Ibid.*, Art 1(1).

²⁴⁷ Council Regulation (EU) 15 November 2017 laying down management, conservation and control measures applicable in the Convention area of the International Commission for the Conservation of Atlantic Tunas (ICCAT), No 2017/2107, 15 November 2017.

²⁴⁸ EFCA on NEAFC, available at: <https://www.efca.europa.eu/en/content/neaafc>; EFCA on NAFO, available at: <https://www.efca.europa.eu/en/content/nafo>; EFCA in ICCAT, available at: <https://www.efca.europa.eu/en/content/iccat> (all accessed on 02.08.2023).

²⁴⁹ FAO, Haberkon E et al, 'Regional fisheries management organizations and advisory bodies, Activities and developments, 2000–2017' (2020) 651 *FAO Fisheries and Aquaculture Technical Paper*, p 47.

²⁵⁰ ICES Special Request Advice, NEAFC and OSPAR joint request on the status and distribution of deep/water elasmobranchs (2020) available at: <https://ices-library.figshare.com/ndownloader/files/33416549>; Heij E, 'The OSPAR NEAFC Collective Arrangement and Ocean Governance: Regional Seas Organisations as the Setters of Conservation Standards in ABNJ?' (2022) *The International Journal of Marine and Coastal Law*, p 612.

RFMOs for the program on collection of various data on shark species.²⁵¹ Collaboration has also been established with CITES, whereby ICCAT aims to provide consultations to CITES prior to the listing of any species in the CITES Appendices. This general collaboration involves organising training courses and collecting data on sharks, enhancing the exchange of information and expertise between these international conservation initiatives.²⁵²

NGOs are considered critical components and drivers of transparency in fisheries governance while monitoring compliance and providing additional expertise.²⁵³ RFMOs engage with different NGOs, which may participate in the majority of meetings regarding relevant topics²⁵⁴ and contribute to the information gathering related to monitoring, control and surveillance.²⁵⁵ For instance, in the meeting concerning the SRDCP, observers from non-governmental organisations such as Oceana²⁵⁶ and Pew Charitable Trusts were present. NGOs are further allowed to submit compliance information to RFMOs.²⁵⁷

3.5 Concluding Remarks

ICCAT, NEAFC, and NAFO have implemented their CMMs with principles derived from international legal frameworks such as UNCLOS and UNFSA, laying out specific obligations for conservation of sharks. Additionally, these RFMOs operationalise numerous recommendations found in the FAO Code of Conduct and IPOA-Sharks with regard to conservation of the shortfin makos. ICCAT, in particular, is recognised for its endeavours to adopt a precautionary approach in the conservation measures.

Both NAFO and NEAFC have implemented measures similar to those of the ICCAT. However, a notable distinction exists between these organisations and ICCAT in terms of species-specific measures for shortfin mako conservation. Given the absence of such species-specific measures

²⁵¹ ICCAT Resolution 95-2, SKS & Bycatch.

²⁵² ICCAT Recommendation 93-08, MISC; ICCAT, Report of the Independent Performance Review of ICCAT, n 106, p 71.

²⁵³ Petersson TM, 'Transparency in global fisheries governance: The role of non-governmental organizations,' (2022) 136 *Marine Policy*, p 1.

²⁵⁴ ICCAT, Report of the Independent Performance Review of ICCAT, n 106, p 61; NAFO, Rules of Procedure for Observers to NAFO Meetings (2022), available at: <https://www.nafo.int/Portals/0/PDFs/key-publications/Rules.pdf>, Rule 6(d).

²⁵⁵ Guggisberg S, 'The roles of nongovernmental actors in improving compliance with fisheries regulations,' (2019) 28 *Review of European, Comparative & International Environmental Law*, p 315.

²⁵⁶ Oceana is an NGO which 'mission is to win policy victories that protect world's oceans.' The organization is contributing to the protection of sharks among other species. See <https://oceana.org/about/>; <https://oceana.org/press-releases/oceana-seeks-protections-sharks-and-swordfish-iccat-meeting-turkey/>

²⁵⁷ ICCAT Recommendation 08-09, GEN.

within NAFO and NEAFC, their contribution to the broader conservation of shortfin makos might be perceived as relatively limited compared to the ICCAT. Species-specific measures have the advantage of directly addressing the species' conservation needs, thus potentially achieving more effective conservation outcomes. However, it is essential to acknowledge that NAFO and NEAFC still play a significant role in contributing to the conservation of shortfin mako sharks through their broader CMMs applicable to shark species. While not species-specific, these measures still contribute to the protection of habitats, regulation of fishing activities, and overall sustainable management of fisheries.

Moreover, the overall role of the three RFMOs in the conservation of shortfin makos is significant. Through their binding CMMs, RFMOs can impose specific requirements on the fishing activities of vessels, which are both directly fishing shortfin makos and catching them as bycatch species. The relevant CMMs, such as prompt release and a prohibition of finning and retention allowances, presumably contribute greatly to the further conservation of shortfin makos. While the stocks might not reach the reproduction targets outlined in the assessments,²⁵⁸ there is still potential to decrease the overfishing of shortfin makos. This outcome depends on various factors, including the effective enforcement of measures by vessels under the flag state's jurisdiction and the migration patterns of stocks between distinct regulatory zones. ICCAT's Convention area covers the Northern Atlantic Ocean from west to east, and while NEAFC and NAFO provide for additional measures contributing to the overall sustainable management of fisheries, by complying with the measure of the three RFMOs, there remains an opportunity to reverse the overfishing and work towards the restoration of shortfin mako populations.

²⁵⁸ ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12, pp 13-14.

4 Challenges for RFMOs and Recommendations for Improving Shortfin Mako Conservation

4.1 Introduction

Given the fairly recent implementation of general shark conservation measures by RFMOs and the more recent introduction of species-specific measures targeted to the conservation of shortfin makos, it can be asserted that RFMOs are only beginning to combat the overfishing of sharks and adjusting their approaches to current conditions of the fisheries.²⁵⁹ However, RFMOs encounter several significant challenges, including limited cross-RFMO and international cooperation, inadequate CMMs, and difficulties with enforcement and compliance, entailing insufficient reporting and enforcement of the CMMs.²⁶⁰ This chapter seeks to examine the challenges faced by RFMOs, particularly by ICCAT, NAFO and NEAFC, in their conservation efforts for shortfin makos, determining possible gaps and inconsistencies in the applicable regulations. Furthermore, it aims to offer a range of practical recommendations to address these challenges effectively. Ultimately, the goal is to provide insights that contribute to enhancing the conservation efforts for shortfin makos and to guide the future actions of RFMOs towards more effective conservation measures.

4.2 Lack of Cooperation and Collaboration

Presently, the responsibility for upholding global commitments to conserve marine biodiversity beyond national jurisdictions is distributed across various global and regional regimes that focus on distinct activities, concerns, and areas.²⁶¹ However, these regimes often lack effective coordination and cooperation,²⁶² which are essential for managing highly migratory fisheries such as shortfin makos.²⁶³

The first challenge arises from the fragmentation of the binding regulatory framework applicable to shortfin makos, the result of the insufficient cooperation between RFMOs. Shortfin makos are highly migratory and have an extensive global habitat in the world's oceans

²⁵⁹ Mucientes G et al, 'Unreported discards of internationally protected pelagic sharks in a global fishing hotspot are potentially large' (2022) 269 *Biological Conservation*, pp 1-2.

²⁶⁰ Barker JM and Schluessel V, 'Managing global shark fisheries: suggestions for prioritizing management strategies' (2004) 15 *Aquatic Conservation: Marine and Freshwater Ecosystems*, p 332.

²⁶¹ Heidrich KN et al, n 2, p 1265.

²⁶² Heidrich KN et al, n 2, p 1265.

²⁶³ Barker JM and Schluessel V, n 253, p 333.

– they are distributed throughout all oceans between 60°N and 50°S and may travel several thousands of kilometres.²⁶⁴ It is thus crucial to uphold consistent conservation measures across the different habitat areas of these species, and RFMOs play a vital role in that due to their mandate to enact binding CMMs in respect of the shortfin mako.²⁶⁵ Although ICCAT governs both the Northern and Southern parts of the Atlantic Ocean, no other RFMOs in the Pacific or Indian Oceans have implemented species-specific CMMs for shortfin makos.²⁶⁶ The absence of CMMs in other RFMOs outside of the ICCAT regulatory area of competence represents a challenge for conserving this species and leads to gaps in its overall protection. While measures adopted by ICCAT can contribute positively to the overall protection of shortfin makos, the lack of similar measures in other RFMOs may potentially result in situations where shortfin makos are exposed to varying levels of fishing pressure and conservation measures, undermining the effectiveness of the conservation efforts put in place by ICCAT.

Furthermore, in areas where jurisdictions of multiple RFMOs overlap, the involvement of all relevant RFMOs is vital to ensure effective and efficient fisheries management.²⁶⁷ Hence, due to the overlap of ICCAT’s jurisdiction with the jurisdictions of NEAFC and NAFO, some inconsistencies might be observed. For instance, under the ICCAT’s recommendation, sharks are required to be landed with their fins attached following the 5% ‘fins-to-carcass’ ratio method.²⁶⁸ At the same time, NAFO and NEAFC require the sharks to be landed with their fins naturally attached. Nevertheless, there are no clear guidelines on whether contracting parties falling under the jurisdiction of two or more of these RFMOs should adhere to the first or the second approach. This ambiguity in inconsistencies between adopted CMMs may lead to vessels of flag States selecting the approach that better suits their specific fishing practices.

Another challenge is the participation of States and stakeholders in RFMOs. The effectiveness of cross-RFMO cooperation and collaboration relies on the engagement of flag and coastal States in the management and decision-making of RFMOs.²⁶⁹ However, the level of

²⁶⁴ ICCAT Secretariat, ‘ICCAT Manual. 2.2.1 Sharks, available at: https://www.iccat.int/Documents/SCRS/Manual/CH2/2_2_1_2_SMA_ENG.pdf (accessed on 02.08.2023).

²⁶⁵ Barker JM and Schluessel V, n 253, p 333.

²⁶⁶ Indian Ocean Tuna Commission (IOTC) has adopted non-binding data recording and reporting measures. See FAO. Database of measures on conservation and management of sharks. Shortfin mako sharks. Available at: <https://www.fao.org/ipoa-sharks/database-of-measures/en/> (accessed on 22.08.2023).

²⁶⁷ Harrison J, ‘Key Regional Fisheries Governance Challenges,’ n 174, p 97.

²⁶⁸ ICCAT Recommendation 21-09, BYC.

²⁶⁹ Barker JM and Schluessel V, n 253, p 333.

participation has been inadequate, although the engagement of all relevant States is a prerequisite to improving the management of highly migratory sharks.²⁷⁰ ICCAT has the largest number of contracting parties compared to NEAFC and NAFO (52,²⁷¹ 6²⁷² and 6²⁷³, respectively). In the case of NAFO and NEAFC, the relatively smaller number of participating States suggests that fewer States actively engage in the conservation effort. As a result, the effectiveness of the CMM focused on finning through the approach of the 'fins naturally attached' policy could potentially be compromised due to its limited application to a relatively small number of States. Lower participation in NAFO and NEAFC may lead to reduced cooperation efforts between the three RFMOs. This is due to the interconnected nature of these organisations' goals and operations. For instance, if NAFO and NEAFC experience lower engagement, it could lead to fewer joint initiatives and cooperation on shared challenges such as shark conservation, which may, in turn hamper the overall effectiveness of conservation measures. Additionally, reduced participation could impact the exchange of data and information, hindering the development of coordinated strategies to ensure the sustainable management of shortfin makos.

The coastal and flag States' participation in the RFMOs is not the only challenge for RFMOs connected to engagement. Another significant aspect is the effective implementation of CMMs in national laws and regulations by the contracting parties. For instance, by 2019, 'only one-third of the 143 States that report shark catches to the FAO had developed national plans under the IPOA-Sharks, while many of those adopted lack appropriate conservation standards,' for instance, neglecting the need to mitigate direct and indirect impacts to sharks and develop stock assessment reports.²⁷⁴ Furthermore, there are no up-to-date general reports on the implementation of IPOA-Sharks by individual States at the moment of writing this thesis. The lack of proper implementation undermines the intended goals of international legal instruments. When many States fail to adopt or properly implement, e.g., the IPOA-Sharks, it creates a gap in conservation efforts. This not only weakens the impact of CMMs building on the relevant

²⁷⁰ Barker JM and Schluessel V, n 253, p 333.

²⁷¹ See all current contracting parties here: <https://www.iccat.int/en/contracting.html> (accessed on 23.08.2023)

²⁷² Denmark (in respect of the Faroe Islands & Greenland), the EU, Iceland, Norway, Russian Federation, United Kingdom. NEAFC Contracting Parties, available at: <https://www.neafc.org/> (accessed on 3.08.2023).

²⁷³ Canada, Cuba, Denmark (in respect of the Faroe Islands & Greenland), the EU, France, Iceland. NAFO Contracting Parties, available at: <https://www.nafo.int/About-us/Overview-of-NAFO> (accessed on 23.08.2023).

²⁷⁴ Scott KN, 'Bycatch Mitigation and the Protection of Associated Species,' n 174, p 179; Brendal D and Worm B, 'The International Plan of Action for Sharks: How does national implementation measure up?' (2013) 23 *Marine Policy*, pp 313-314.

instruments but also leads to an inconsistent approach in the management of shared marine resources.

Considering the abovementioned challenges, it is crucial for RFMOs to establish cross-organisational cooperation and collaboration for managing bycatch and conserving non-target species as required by the UNFSA.²⁷⁵ RFMOs with overlapping jurisdictions should adopt jointly prepared recommendations stating the applicable measures in respect of any inconsistencies²⁷⁶ (such as CMM on finning prohibition)²⁷⁶ and/or formalising memorandums of understandings in respect of joint information exchange.²⁷⁷ One great example is the 2014 OSPAR Agreement between OSPAR and NEAFC, which provides a forum for the exchange of mutually useful information and *inter alia* cooperation in respect of marine spatial planning and area management.²⁷⁸ A parallel approach might be applied between ICCAT and NEAFC, where the two RFMOs can have a joint forum for the exchange of information of importance. Collaboratively, leveraging NEAFC's practice in establishing area management strategies and ICCAT's scientific data on sharks, the two organisations can work on the development of area-based measures for the effective management of sharks within their shared jurisdiction. Moreover, this collaborative effort may potentially lead to advancements in data accuracy as well.

The Kobe Process of Cooperation has emerged as a forum for promoting collaboration among various tuna RFMOs. The collaboration is mainly focused on tuna species however, bycatch species are also taken into consideration by the Kobe Process working groups.²⁷⁹ Kobe Process can potentially be used as a forum for more extensive collaboration on non-targeted species conservation and bycatch mitigation, where the relevant RFMOs can work collectively to establish common conservation and management measures. While the Kobe Process currently

²⁷⁵ UN, Advance and unedited Report of the 2016 Resumed UNFSA Review Conference (2016), available at: https://www.un.org/Depts/los/convention_agreements/fishstocksmeetings/Adv_ICP_ResumedReviewConferenc e2016.pdf, p 45, par. B.3(a).

²⁷⁶ Harrison J, 'Key Regional Fisheries Governance Challenges,' n 174, p 97. Notably, the Amended ICCAT Convention contains formalised cooperation with other intergovernmental organisations.

²⁷⁷ Anderson D et al, n 204, p 112.

²⁷⁸ North-East Atlantic Fisheries Commission, Collective arrangement between competent international organisations on cooperation and coordination regarding selected areas beyond national jurisdiction in the North-East Atlantic (2014). While OSPAR is not categorised as an RFMO, the collaboration between OSPAR and NEAFC could serve as an example of how regional coordination can be effectively facilitated.

²⁷⁹ Harrison J, 'Key Regional Fisheries Governance Challenges,' n 174, p 99.

Kobe II Process Recommendations. 2nd Joint Tuna RFMOs Meeting (2009), available at: <https://www.tuna-org.org/Documents/TRFMO3/BackgroundInfo.pdf>.

centres on tuna RFMOs, its principles and mechanisms of cooperation may be used to establish similar cooperation mechanisms between other RFMOs that share overlapping geographical regions or have similar conservation concerns. Broadening this cooperative framework would facilitate the harmonisation of measures and the establishment of a cohesive approach to address the challenges posed by bycatch species.

4.3 Inadequate Conservation and Management Measures

Inadequate CMMs implemented by RFMOs represent a significant hurdle in the conservation efforts, potentially impeding the sustainable management of shortfin makos. The CMMs were presented in Chapter 3.2, and the measures intending to safeguard shortfin makos are potentially insufficient for effectively decreasing overfishing and ensuring the sustainable reproduction of its populations. Indeed, while ICCAT's jurisdiction overlaps with the jurisdictions of NEAFC and NAFO, it is important to note that the conservation measures adopted by ICCAT may not provide a comprehensive solution. Hence, revision of the applicable RFMOs' regulations might be needed, and the potential adoption of new regulations might be necessary to ensure comprehensive conservation and protection of shortfin makos.

ICCAT, NEAFC and NAFO have all adopted common CMM – finning prohibition – although the measure is not consistent within the organisations. Other CMMs currently in force include a transshipment prohibition, prompt release obligations with total fishing mortality tonnage and retention allowances.²⁸⁰ Expanding the range of CMMs might be beneficial for the conservation efforts of shortfin makos. The expanded range might encompass primarily time and area closures and the establishment of marine protected areas. These measures, although not extensively employed for shark conservation purposes, may contribute significantly by protecting the usual pupping and nursing areas as well as the main habitats of shortfin makos.²⁸¹

The practices concerning the conservation of shortfin makos established by ICCAT give rise to significant concerns. First, within ICCAT's recommendations aimed at shortfin mako

²⁸⁰ See Chapter 3.2.

The concept of establishing shark sanctuaries, specifically designed to prohibit all commercial shark fishing, is not applicable in this context. This is because commercial fishing for shortfin makos is already prohibited, eliminating the need for such sanctuaries. See Hammerschlag N, Shiffman SD, n 144, p 7.

²⁸¹ ICCAT has suggested implementing time-area closures and other spatial planning measures to protect shark populations, however, it has not adopted such measures. ICCAT, Report of the Standing Committee on Research and Statistics (2010), available at: https://www.iccat.int/documents/meetings/docs/2010_scrs_eng.pdf, p 165.

conservation, the organisation distinguishes between the northern and southern Atlantic stocks of shortfin makos, leading to divergent conservation measures. For instance, for southern shortfin makos, ICCAT has instituted a total retention allowance of 1,295 t and total fishing mortality of 'no more than the minimum reported annual catch in the last five years of the assessment (i.e., 2,001 t).²⁸² In contrast, for northern shortfin makos, ICCAT has imposed a limitation on total fishing mortality not exceeding 250 t.²⁸³ Considering the high migratory patterns of the shortfin makos, the approach where ICCAT distinguishes between the northern and southern shortfin mako stocks is questionable. The species can traverse the Northern and Southern Atlantic Oceans,²⁸⁴ potentially blurring the lines between the stocks in two distinct areas. Hence, the lack of a geographical border in the open ocean means that the conservation measures for one area or particular stocks may impact another area due to the species' mobility.

Second, ICCAT's adoption of the finning prohibition through the utilisation of the 'fin-to-carcass' ratio approach raises concerns about its practices. This method has been criticised by the scientific community as it poses difficulties in monitoring and enforcement.²⁸⁵ Moreover, differences between various species (the variable is 1.1% to 10.9%), the weighing conditions and finning techniques are not considered when applying this approach.²⁸⁶ Hence, employing this method might result in a higher number of sharks being killed and discarded, thereby adding complexity to the estimation of mortality rates.²⁸⁷ The most effective strategy for improving this specific conservation measure and ensuring its successful enforcement would involve revising the measure to specify that all sharks must be landed with their fins naturally attached, as suggested by the United Nations General Assembly (UNGA).²⁸⁸ This method is the most reliable and easier to enforce, permitting better data collection.²⁸⁹

The third challenge relates to the lack of possible active engagement by ICCAT in promoting additional CMMs beyond what is already adopted, such as those focused on fishing gear and

²⁸² ICCAT Recommendation 22-11, BYC.

²⁸³ ICCAT Recommendation 21-09, BYC.

²⁸⁴ ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12.

²⁸⁵ JE Techera and N Klein, n 1, p 168.

²⁸⁶ Techera EJ, 'Fishing, Finning and Tourism: Trends in Pacific Shark Conservation and Management' (2012) 27 *The International Journal of Marine and Coastal Law*, p 605; Davidson KNL, Dulvy KN and Krawchuk AM, 'Why have global shark and ray landings declined: Improved management or overfishing?' (2015) 17, p 16.

²⁸⁷ Davidson KNL, Dulvy KN and Krawchuk AM, 'Why have global shark and ray landings declined: Improved management or overfishing?' (2015) 17 *Fish and Fisheries*, p 17.

²⁸⁸ UNGA Res 62/177 (2007), Art 12.

²⁸⁹ JE Techera and N Klein, n 1, p 167.

area-based management. Despite ICCAT's endorsement of further research concerning hook types and the time and area closures,²⁹⁰ there seems to be a lack of concrete actions in this direction.

Studies have shown that limiting specific fishing gear types can impact the number of caught shark species.²⁹¹ An assessment of circle hooks' impact on the mortality of shortfin makos was conducted by ICCAT in 2018, revealing that the mortality estimate using circle hooks exceeded that of J-hooks by over 1.6 times.²⁹² Nonetheless, the 2021 ICCAT Recommendation emphasises that 'the SCRS shall continue to prioritise research into' /.../ gear configuration and modification /.../' and no CMMs have been adopted with the requirement to use J-hooks.²⁹³ Furthermore, there are also other possible gear modifications that may be adopted to conserve the shortfin makos. For instance, research indicates that substituting nylon leaders for wire leaders can significantly decrease shark bycatch rates.²⁹⁴ The research conducted by ICCAT showed that using the wire leaders increased the retention rate, though not significantly.²⁹⁵ Moreover, IPOA-Sharks points out that mechanisms similar to the 'turtle exclusion devices' could be incorporated to exclude sharks as previously, the devices have led to a reduction in shark catches.²⁹⁶ Still, the potential benefits of gear modifications and other CMMs might lead to more efficient conservation of shortfin makos.

Prioritising area-based management tools, such as time and area closures and marine protected areas, is crucial. These measures offer substantial protection to critical shark habitats, including areas crucial for nursery, pupping, and mating activities.²⁹⁷ ICCAT has already identified significant key regions for shortfin mako sharks, such as the vicinity of the Canary Archipelago, Northwest Africa, and the waters off southern Brazil and Uruguay.²⁹⁸ In the past, ICCAT has effectively used closures, both in specific zones and during designated seasons, to regulate the

²⁹⁰ ICCAT Recommendation 21-09, BYC.

²⁹¹ Hammerschlag N, Shiffman SD, n 144, p 4.

²⁹² ICCAT, Honda H et al 'A Trial Evaluation of the Effectiveness of the Use of Circle Hooks to Reduce Mortality of Shortfin Mako Shark in Pelagic Longline Fisheries Mortality of Shortfin Mako Shark on Circle Hooks vs J-Hooks' (2018).

²⁹³ ICCAT Recommendation 21-09, BYC.

²⁹⁴ Darbyshire R et al, 'Large-scale experiment shows that nylon leaders reduce shark bycatch and benefit pelagic longline fishers' (2008) 90 *Fisheries Research*, p 107.

²⁹⁵ ICCAT, Coelho R, Santos CC, Rosa D, 'Assessing the effects of hook, bait and leader type as potential mitigation measures to reduce bycatch and mortality rates of shortfin mako: a meta-analysis with comparisons for target, bycatch and vulnerable fauna interactions,' (2009), p 253.

²⁹⁶ IPOA-Sharks, p 6.3.

²⁹⁷ Barker J Mishaël and Schluessel V, n 253, p 226.

²⁹⁸ ICCAT/SRDPC, Report of the Shark Research and Data Collection Programme, n 153, Appendix 9, p 276

use of fishing aggregation devices for their target species.²⁹⁹ Similarly, Australia has taken proactive steps to safeguard gummy sharks by implementing time-area closures during their migration to pupping grounds, resulting in a notable reduction in fishing-related mortality.³⁰⁰

Hence, spatial management tools represent a practical approach to safeguarding shortfin makos and should be incorporated by Northern Atlantic RFMOs together with other relevant CMMs to reach the objectives of conservation and restoration of the stocks. However, it is imperative to enhance data collection regarding shark habitats to ensure the successful implementation of these CMMs, as discussed in the next chapter.

ICCAT's history has shown that it has consistently leaned towards establishing quotas exceeding the recommendations offered by scientific advisors.³⁰¹ For shortfin makos, the stock status is defined by SSF/SSF_{MSY} and F/F_{MSY} ,³⁰² where F stands for fishing mortality and fishing mortality at MSY, respectively, and SSF for spawning stock fecundity.³⁰³ ICCAT does not use reference points for assessing the status of shortfin mako stocks as is required by UNFSA Article 6(3)(b), and 'applying F_{MSY} as a target reference point might result in significant depletion for these [shark] stocks.'³⁰⁴ Therefore, it would be recommended for ICCAT to develop reference points for shortfin mako stocks for efficient decrease in overfishing.

The analysis provided in this chapter questions the extent to which ICCAT, as an RFMO, is fulfilling its obligations to promote effective conservation and management practices for the non-targeted species. While ICCAT encourages further research and consideration of various aspects, such as the effectiveness of different hook types and implementation of time and area-based closures, the translation of these intentions into actions remains limited. This raises questions about the extent to which ICCAT, as an RFMO, is fulfilling its obligation to ensure the long-term sustainability of highly migratory fish stocks set out in Article 10(a) of UNFSA.

²⁹⁹ ICCAT Recommendation 98-01, TROP; ICCAT Recommendation 22-01, TROP;

³⁰⁰ Hammerschlag N, Shiffman SD, n 144, p 4.

³⁰¹ JE Techera and N Klein, n 1, p 157.

³⁰² ICCAT, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, p 7

³⁰³ Courtney D, Kai M, Rice J, ICCAT, 'Stock synthesis projections at alternative fixed fishing mortality rates to evaluate the effect of live release for North Atlantic Shortfin Mako'(2020), p 346.

³⁰⁴ ICCAT, Chair's Report of the 1st Joint Tuna RFMO Bycatch Working Group Meeting (2019), available at: https://www.iccat.int/Documents/meetings/docs/2019/reports/2019_JWGBY-CATCH_ENG.pdf, p 3.

Furthermore, the idea of "best available scientific information"³⁰⁵ is central to fisheries management. If ICCAT acknowledges the need for further research into hook types and area-based closures but fails to act upon these findings effectively, it can potentially be criticised for not adequately utilising the most up-to-date scientific information.

Another question is whether there is a need for NAFO and NEAFC to establish species-specific CMMs for the conservation of shortfin makos. To answer that question, a comprehensive analysis of potential outcomes and strong cooperation between NAFO, NEAFC, and ICCAT will be needed to establish a forum for the sharing of data and practices. The availability of accurate and up-to-date data on shortfin mako populations, stock assessments, and potential bycatch rates within NAFO and NEAFC areas will be crucial in determining whether species-specific measures are necessary. While it is plausible that NAFO and NEAFC do not need to adopt other species-specific CMMs, their collaborative engagement could still be significant. This is particularly relevant in the context of embracing an ecosystem approach. Presently, fishery management frameworks tend to give minimal attention towards strategies addressing the effects of fisheries on broader ecological components, including bycatch, habitats, and food webs.³⁰⁶ Hence, NEAFC and NAFO carry a responsibility to apply the ecosystem approach and hence be involved in the conservation efforts given the potential influence of their targeted fisheries' species on shortfin mako populations.

The IPOA-Sharks stipulates that in the context of precautionary approach 'controls should be implemented early during the developmental phases of fisheries taking sharks and other chondrichthyan species' in order to prevent overfishing and depletion of stocks.³⁰⁷ However, there are questions regarding the extent to which ICCAT has implemented the precautionary approach in its practices. In 2012, the stock assessment for shortfin makos highlighted the uncertainties surrounding the overfishing of these stocks and recommended managing them without increasing fishing mortality.³⁰⁸ Nevertheless, more stringent measures, encompassing the encouragement of prompt release for contracting parties were only adopted in 2017.³⁰⁹

³⁰⁵ UNFSA, Article 5(b).

³⁰⁶ Anderson D et al, n 204, pp 24-25.

³⁰⁷ IPOA-Sharks, Art 1.3.

³⁰⁸ ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting (2019) available at https://www.iccat.int/Documents/Meetings/Docs/2012_Shk_ASS_Eng.Pdf, p 10-11.

³⁰⁹ ICCAT Recommendation 17-08.

4.4 Challenges in Compliance and Enforcement of Conservation and Management Measures

The enforcement challenges relating to the relevant CMMs primarily encompass the issue of under-reporting of data by contracting States. However, the accurate reporting and availability of catch statistics provide a detailed representation of populations, resulting in the practical assessment of fisheries resources.³¹⁰ The enforcement of the CMMs by the RFMOs' contracting parties poses another issue, as the extent to which observers are present on fishing vessels impacts the verification of compliance with established CMMs.³¹¹ Addressing these challenges is vital for enhancing the efficacy of fishery management strategies. However, it is important to note that certain overarching challenges faced by RFMOs, including those related to port-state measures and participation of non-contracting parties,³¹² are beyond the immediate scope of this discussion.

The UNFSA emphasises that CMMs should be based on the best scientific evidence available.³¹³ Nevertheless, the number of sharks caught has been under-reported for decades and therefore, their management has been especially challenging for RFMOs.³¹⁴ Independent scientific research conducted on certain shark species over three months has indicated that insufficient data is being reported, meaning that the overfishing of sharks remains undetected. With respect to shortfin makos, the studies indicate that poor reporting remains in relation to the post-release mortality of sharks, and this primarily affects stock rebuilding.³¹⁵ Moreover, the inadequate reporting of data complicates the identification of areas where shark species aggregate, leading to challenges in establishing effective spatial management measures.³¹⁶

The above is recognised in the ICCAT's Performance Report in respect of sharks, stating that:

'If all CPCs actually implemented the ICCAT resolutions and recommendations in relation to sharks, this would go some way to dealing effectively with the management of shark fisheries and shark bycatch. However, the endemic levels of non-reporting and non-compliance with the recommendations and resolutions would indicate that these

³¹⁰ Heidrich KN et al, n 2, p 1267.

³¹¹ Hocevar J, 'An evaluation of Regional Fisheries Management Organization at-sea compliance monitoring and observer programs,' (2020) 115 *Marine Policy*, p 10.

³¹² EJ Molenaar, n 19, p 98-99.

³¹³ UNFSA Art 5(b)

³¹⁴ Mucientes G et al, n 252, pp 1-2.

³¹⁵ *Ibid*, pp 2-3.

³¹⁶ *Ibid*, p 5

have not been effective and have not been applied and adhered to by the CPCs. The Panel recommended that ICCAT CPCs immediately implement and comply with the ICCAT recommendations and resolutions to provide accurate and reliable data to the SCRS.³¹⁷

Furthermore, the report highlights that from 2008 to 2016, there was ‘only a modest’ in reporting and compliance efforts.³¹⁸ Hence, given that the retention level of shortfin makos relies on data provided by CPCs,³¹⁹ it may be assumed that calculations undertaken to restore shortfin mako stocks, as outlined in ICCAT's 2021 recommendation,³²⁰ might lack accuracy. As a data reporting measure, ICCAT has introduced shark check sheets (refer to Chapter 3.3). The requirement to publicly share the check sheets may potentially be a precondition for accessing tuna fisheries, which can result in enhanced data reporting.³²¹ Moreover, dedicated shark subcommittees within the existing scientific committees of different RFMOs can be established to assess the gathered data.³²² Through the improvement of reporting mechanisms, RFMOs can more effectively implement the precautionary approach outlined in the IPOA-Sharks and UNFSA Article 6, due to the increased accuracy of data.

To ensure the enforcement of CMMs and increase the amount of collected data on bycatch, RFMOs have implemented observer programmes and schemes (refer to Chapter 3.3.). However, as observer coverage is a crucial component for enforcement, the level of observers of 10% for shortfin makos might not be sufficient.³²³ For pelagic trawlers and longline vessels engaged in bluefin tuna fishing, the observer coverage is required to be at least 20%.³²⁴ Moreover, the contracting parties may deploy electronic monitoring systems (also VMS) on board instead of having human observers.³²⁵ However, exploiting both surveillance methods simultaneously may be considered for optimal data accuracy and reducing potential human errors.

³¹⁷ ICCAT, Report of the Independent Performance Review of ICCAT, n 106, p 31.

³¹⁸ ICCAT, Report of the Independent Performance Review of ICCAT, n 106, p 33

³¹⁹ ICCAT Recommendation 2021-09.

³²⁰ *Ibid.*

³²¹ Amaral EJ et al, ‘Policy and transparency gaps for oceanic shark and rays in high seas tuna fisheries’ (2023) 23 *Fish and Fisheries*, pp 64-65.

³²² JE Techera and N Klein, n 1, p 167

³²³ ICCAT, Chair’s Report of the 1st Joint Tuna RFMO Bycatch Working Group Meeting, n 297, p 56.

³²⁴ ICCAT Recommendation 21-09.

³²⁵ *Ibid.*

By examining the national regulations of some of the RFMOs' contracting parties, it becomes evident that they do not entirely integrate the RFMOs' binding recommendations into their domestic laws. For instance, the National Oceanic and Atmospheric Administration of the US adopted a rule in July 2022 giving effect to the recommendation of ICCAT and setting a prohibition on the retention of shortfin makos, requiring the release of all shortfin makos (dead or alive) in the same year. However, the requirement above is determined as flexible, giving space for commercial vessels to retain on board shortfin makos caught incidentally or directly using certain fishing gears and holding specific permits (e.g. 'Shark Directed or Shark Incidental Limited Access Permit').³²⁶

Notably, Spain's recorded landings of shortfin makos far exceed those of Portugal, with Spain's recorded landings being nearly six times as high.³²⁷ This significant difference calls for assessing the implications of catch amount and the possibility of implementing distinct measures for each country to ensure equitable enforcement and conservation efforts.

4.5 Concluding Remarks

The challenges faced by RFMOs in conserving and managing sharks and shortfin mako populations highlight a range of challenges that necessitate careful consideration for effective and sustainable outcomes. The adopted CMMs hold significant importance, although the current suite of measures seems to fall short of fully addressing the urgent conservation needs pertaining to shortfin makos. The inconsistencies in RFMOs' approaches and shortcomings in existing measures and enforcement mechanisms highlight the necessity for inclusive and aligned approaches.

The distinct mandates of ICCAT, NAFO and NEAFC and varying levels of engagement among the organisations may result in gaps within conservation efforts, particularly when measures adopted by one RFMO do not resonate with the measures adopted by the others. Moreover, the wide-ranging migratory patterns of the species across numerous jurisdictions further complicate the efficacy of conservation measures, necessitating close cross-collaboration and cooperation among RFMOs. Furthermore, the divergence in practices concerning northern and southern

³²⁶ US National Oceanic and Atmospheric Administration, Atlantic Highly Migratory Species, Shortfin Mako Shark Retention Limit (07 May 2022) 50 CFR 635.

³²⁷ ICCAT. *Report for Biennial Period 2018–19, Part I* (2019), n 5, p 231.

Atlantic stocks, as delineated within ICCAT's recommendations, raises a need for more comprehensive and unified management strategies.

The enforcement-related challenges primarily revolve around the reporting of fisheries data and lack of compliance. The accuracy of statistics on shortfin makos is hindered by underreporting, obscuring the authentic magnitude of shark catches and hampering well-informed management judgments. Moreover, the presence of observers on board fishing vessels plays a pivotal role in ensuring adherence to established CMMs, and increasing their coverage is fundamental for ensuring reliable data collection. The enforcement of CMMs is also challenged by variations in the incorporation of RFMO recommendations into domestic regulations and laws among contracting parties.

To address these challenges, RFMOs must prioritise the harmonisation of their measures and collaboration in their conservation strategies. Expanding joint conservation measures and exchanging best practices by establishing close cooperation, such as the Kobe Process, can facilitate greater cohesion among the relevant RFMOs. Furthermore, establishing dedicated shark subcommittees within the existing scientific committees can help in data enhancement and new CMM proposals. These specialised subcommittees would play a role in assessing the compiled data and formulating appropriate recommendations for measures based on the information.³²⁸

Moreover, in meeting their responsibilities, RFMOs must apply ecosystem and precautionary approaches for managing shortfin makos, given the inherent uncertainty associated with the assessments of these species.³²⁹ Finally, some legal authors have suggested creating a specific organisation to enhance shark management efforts, comparable to the International Whaling Commission.³³⁰ Creating such an organisation would clearly show a commitment to the conservation and management of sharks. However, it is unlikely that there will be enough support to make this happen due to the required responsibilities and costs, which is a common situation impeding the conservation of species internationally.³³¹

³²⁸ JE Techera and N Klein, n 1, p 167.

³²⁹ ICCAT, Report of the Independent Performance Review of ICCAT, n 106, p 16.

³³⁰ JE Techera and N Klein, n 1, p 169.

³³¹ *Ibid*, n 1, p 175.

5 Conclusion

The aim of the thesis was to assess the role of the RFMOs in the conservation of shortfin makos in the Northern Atlantic. Initially, the study examined and analysed the framework of conservation and management measures guiding the conservation of the shortfin makos. Subsequently, the thesis explored the mechanisms relating to how the RFMOs have operationalised the relevant measures. Lastly, the research identified key challenges and offered recommendations to deal with these challenges effectively.

Conserving shortfin makos in the Northern Atlantic involves an interplay of global legal frameworks and RFMO operations. Among the three RFMOs examined, namely ICCAT, NEAFC, and NAFO, each contributes to the overall conservation of mako sharks. Nevertheless, a notable disparity arises among these RFMOs in terms of their approaches, specifically targeting the conservation of shortfin makos. The latest shortfin mako stock assessment report indicates that the stocks are overfished, and measures limiting the retention of the species are needed to restore these stocks.³³² Among the regulations contributing greatly to the conservation of the species are the adoption and operationalisation of prohibitions of finning and retention or so-called prompt release requirements. The ‘zero-retention’ requirement is included in the latest recommendation of ICCAT adopted in 2019 and States that ‘CPCs shall implement a prohibition on retaining on board, transshipping and landing, whole or in part, North Atlantic shortfin mako caught in association with ICCAT fisheries /.../.’³³³ It gives effect to the obligations embedded in Article 5 of the UNFSA and the IPOA-Sharks, encompassing the requirement to adopt CMMs ‘with a view to /.../ restoring populations’ of species associated with target stocks.³³⁴ The objective of the said measure is to rebuild the shortfin mako stocks, while the most widely adopted finning ban contributes to the decrease of the harmful practices involving the trade of shark fins.

The enforcement mechanisms of RFMOs further contribute to the conservation of shortfin makos. RFMOs have established various enforcement measures such as reporting, observer schemes, monitoring and inspections, which are expected to ensure the compliance of flag States with the adopted CMMs addressed to the conservation of shortfin makos. As an example,

³³² ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting, n 12

³³³ ICCAT Recommendation 2021-09, BYC.

³³⁴ UNFSA Art 5(e).

ICCAT has introduced so-called 'shark check sheets.' These sheets must be filled out by contracting parties, providing information to ICCAT regarding the progress of CMM implementation. Considering the CMMs and the mandate of RFMOs to enforce these regulations in the Northern Atlantic Ocean, the role of the RFMOs in the conservation of shortfin makos is significant.

The primary challenges for the conservation of shortfin makos by RFMOs in the Northern Atlantic Ocean include difficulties with enforcement of - and compliance with CMMs by the relevant CPCs and lack of cooperation, as shown in Chapter 4. The level of involvement of RFMOs regulating the areas where highly migratory shortfin makos habitat is not sufficient, which may result in varying levels of fishing pressure and potentially undermine the CMMs adopted by ICCAT. While it is not necessary for NAFO and NEAFC to adopt shortfin mako-specific conservation measures, it is still vital to establish efficient cooperation between all relevant RFMOs for better data exchange and collaboration. The outcomes of this research project suggest that RFMOs should harmonise their measures in collaboration with other stakeholders and within the organisations themselves.

It is crucial to identify the shortcomings of the RFMOs measures as they may potentially undermine the effectiveness of the CMMs addressed to the conservation of shortfin makos in the Northern Atlantic Ocean. The implementation of additional CMMs might potentially highly contribute to the conservation of mako sharks. Hence, RFMOs should actively engage in researching fishing gear and spatial management measures that could potentially decrease the mortality of shortfin makos and minimise bycatches and, consequently, adopt the additional measures. Finally, increasing the compliance of contracting parties of RFMOs with CMMs by publicly publishing compliance reports and implementing additional monitoring requirements should be prioritised. Furthermore, RFMOs must continue their application of international law principles deriving from UNCLOS and UNFSA through the operationalisation of, e.g., the ecosystem and precautionary approach. In this context, NEAFC and NAFO need to focus on the entire ecosystem and consider the potential consequences for shortfin makos of fisheries in their areas. Moreover, RFMOs should commit to obtaining accurate and up-to-date data on shortfin makos, as this is crucial for the more effective implementation of the precautionary approach.

Works cited

I. International Conventions

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 (adopted 5 August 1995, in force 11 December 2001) 2167 UNTS 88

Convention on International Trade in Endangered Species of Wild Fauna and Flora (adopted 3 March 1973, in force 1 July 1975) 993 UNTS 243.

Convention on the Conservation of Migratory Species of Wild Animals (adopted 23 July 1979, in force 1 November 1983) 1651 UNTS 333.

Convention on Future Multilateral Cooperation in North-East Atlantic Fisheries (NEAFC Convention) (adopted on 18 November 1980, in force from 1982).

Convention on Cooperation in the Northwest Atlantic Fisheries (NAFO Convention) (2017).

International Convention for the Conservation of Atlantic Tunas (ICCAT Convention) (1972) 7th Revision.

United Nations Convention on the Law of the Sea (10 December 1982, in force 16 November 1994) 1833 UNTS 396

Vienna Convention on the Law of Treaties (VCLT) (adopted 23 May 1969, in force 27 January 1980) 1155 UNTS 331

Statute of the International Court of Justice (adopted 26 June 1945, in force 24 October 1945) USTS 993.

United Nations Convention on Biological Diversity (adopted 5 June 1992, in force 29 December 1993) 1760 UNTS 69.

II. Other Legal Instruments

CMS, Memorandum of Understanding on the Conservation of Migratory Sharks (1 March 2010) IUCN TRE-154630.

Council Regulation (EU) 15 November 2017 laying down management, conservation and control measures applicable in the Convention area of the International Commission for the Conservation of Atlantic Tunas (ICCAT), No 2017/2107, 15 November 2017.

Council Regulation (EU) laying down conservation and enforcement measures applicable in the Regulatory Area of the Northwest Atlantic Fisheries Organisation, No 2019/833, 20 May 2019.

Council Regulation (EU) on the removal of fins of sharks on board vessels, No 605/2013, 29 June 2013.

Food and Agricultural Organization of United Nations, Code of Conduct for Responsible Fisheries (adopted on 31 October 1995) ISBN 92-5-103834.

Food and Agricultural Organization of United Nations, Technical Guidelines for Responsible Fisheries (2000) ISSN 1020-5292.

North-East Atlantic Fisheries Commission, Collective arrangement between competent international organisations on cooperation and coordination regarding selected areas beyond national jurisdiction in the North-East Atlantic (2014).

UNCED, The Rio Declaration on the Environment and Development (1992) ILM 31, 874.

UNGA Res 37/7 (1982)

UNGA Resolution on Sustainable fisheries, including through the 1995 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, and related instruments, 62/177 (2007).

UNGA, Rio Declaration on Environment and Development (1992) 151/26

US National Oceanic and Atmospheric Administration, Atlantic Highly Migratory Species, Shortfin Mako Shark Retention Limit (07 May 2022) 50 CFR 635.

III. Case Law

Request for an advisory opinion submitted by the Sub-Regional Fisheries Commission (SRFC) (Great Britain v United States of America) (Advisory Opinion) ITLOS Rep. 21.

The North Atlantic Coast Fisheries Case (Award) (Great Britain v United States of America) [1910] PCA RIAA XI 167.

IV. Book Chapters

Caddell R and Molenaar EJ (eds.) *Strengthening International Fisheries Law on an Era of Changing Oceans* (Hart Publishing Oxford 2019).

EJ Molenaar, 'Regional Fisheries Management Organizations' in Ribeiro CM et al (eds), *Global Challenges and the Law of the Sea* (Springer Nature Switzerland 2020)

Elfering AGO et al (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press Oxford 2015), pages 439-462.

Heithaus RM et al, 'Unraveling the Ecological Importance of Elasmobranchs' in Carrier CJ et al (ed), *Sharks and Their Relatives II: Biodiversity, Adaptive Physiology, and Conservation* (Taylor & Francis Group Florida 2019) pp 613-614, 619.

JE Techera and N Klein, *International Law of Sharks* (Brill | Nijhoff Leiden 2017) pp 3-4.

Proelss (ed), *United Nation Convention on the Law of the Sea. A Commentary* (Verlag C. H. Beck oHG München 2017),

Rothwell RD, Stephens T, *The International Law of the Sea. Second Edition* (Hart Publishing London 2016)

Tanaka Y, 'The International Law of the Sea 2nd edition' (Cambridge University Press Cambridge 2019, pp 38 and 48.

V. Articles

- Amaral EJ et al, 'Policy and transparency gaps for oceanic shark and rays in high seas tuna fisheries' (2023) 23 *Fish and Fisheries*.
- Arocha F et al, 'Ecological risk assessment of pelagic sharks caught in Atlantic pelagic longline fisheries' (2010) 21 *Aquatic Living Resources*.
- Asgeirsson MH and Campbell D, 'Illegal, Unreported, and Unregulated Fishing: How the North-East Atlantic Fisheries Commission Addresses the IUU Fishing Challenge – Is It Working?' (2020) 34 *Ocean Yearbook*.
- Barker JM and Schluessel V, 'Managing global shark fisheries: suggestions for prioritizing management strategies' (2004) 15 *Aquatic Conservation: Marine and Freshwater Ecosystems*.
- Belhabib D, Rosello M, Vilata J 2021, 'Atlantic Shortfin Mako: Chronicle of a death foretold?' (2021) 10 *Laws*,
- Beuningen D et al, 'Fishing for survival: Importance of shark fisheries for the livelihoods of coastal communities in Western Ghana.' (2022) 246 *Fisheries Research*.
- Bjørndal T et al, 'Social, Economic, and Regulatory Drivers of the Shark Fin Trade.' (2017) 22:3 *Marine Resource Economics* 22:3.
- Boggs C et al, 'The Role of Sharks and Longline Fisheries in a Pelagic Ecosystem of the Central Pacific' (2002) 5 *Ecosystems*.
- Brendal D and Worm B, 'The International Plan of Action for Sharks: How does national implementation measure up?'(2013) 23 *Marine Policy*.
- Carlson J et al, 'Movements, Habitat Use, and Diving Behavior of Shortfin Mako in the Atlantic Ocean' (2021) 8 *Frontiers in Marine Science*.
- Cortés E, 'Incorporating Uncertainty into Demographic Modeling: Application to Shark Populations and Their Conservation.' (2002) 16 *Conservation Biology*.
- Darbyshire R et al, 'Large-scale experiment shows that nylon leaders reduce shark bycatch and benefit pelagic longline fishers' (2008) 90 *Fisheries Research*.
- Davidson KNL, Dulvy KN and Krawchuk AM, 'Why have global shark and ray landings declined: Improved management or overfishing?' (2015) 17 *Fish and Fisheries*.
- Dinkel MT and Sanchez-Lizas LJ, 'Involving stakeholders in the evaluation of management strategies for shortfin mako (*Isurus oxyrinchus*) and blue shark (*Prionace glauca*) in the Spanish longline fisheries operating in the Atlantic Ocean.' (2020) 120 *Marine Policy*.
- Field CI et al, 'Susceptibility of Sharks, Rays and Chimaeras to Global Extinction' (2009) 56 *Environmental Science*.
- Guggisberg S, 'The roles of nongovernmental actors in improving compliance with fisheries regulations,' (2019) 28 *Review of European, Comparative & International Environmental Law*.
- Hammerschlag N, Shiffman SD, 'Shark conservation and management policy: a review and primer for non-specialists' (2016) 19 *Animal Conservation*.
- Heidrich KN, 'Assessing progress in data reporting by tuna Regional Fisheries Management Organizations' (2022) 23:6 *Fish and Fisheries*.

Heij E, 'The OSPAR NEAFC Collective Arrangement and Ocean Governance: Regional Seas Organisations as the Setters of Conservation Standards in ABNJ?' (2022) *The International Journal of Marine and Coastal Law*.

Hocevar J, 'An evaluation of Regional Fisheries Management Organization at-sea compliance monitoring and observer programs,' (2020) 115 *Marine Policy*.

Huang H et al, 'Blue Shark (*Prionace glauca*) Distribution in the Pacific Ocean: A Look at Continuity and Size Differences' (2023) 15 *Water*.

Meltzer E, 'Global Overview of Straddling and Highly Migratory Fish Stocks: Maps and Charts Detailing RFMO Coverage and Implementation' (2005) 20 *The International Journal of Marine and Coastal Law*.

Mucientes G et al, 'Unreported discards of internationally protected pelagic sharks in a global fishing hotspot are potentially large' (2022) 269 *Biological Conservation*.

Petersson TM, 'Transparency in global fisheries governance: The role of non-governmental organizations,' (2022) 136 *Marine Policy*.

Techera EJ, 'Fishing, Finning and Tourism: Trends in Pacific Shark Conservation and Management' (2012) 27 *The International Journal of Marine and Coastal Law*.

VI. Official Publications

FAO

FAO, Clarke M, Patterson K, Deep-sea fisheries management: the approach taken by the European Union' (2005) *FAO*

FAO, Haberkon E et al, 'Regional fisheries management organizations and advisory bodies, Activities and developments, 2000–2017' (2020) 651 *Fisheries and Aquaculture Technical Paper*.

ICCAT

Draft Protocol to Amend the International Convention for the Conservation of Atlantic Tunas (2019) PLE_108.

ICCAT, 'Compendium Management Recommendations and Resolutions Adopted by ICCAT for the Conservation of Atlantic Tunas and Tuna-Like Species' (2023)

ICCAT, Fernández-Costa J et al, 'Updated Standardized Catch Rates of Shortfin Mako (*Isurus Oxyrinchus*) Caught by the Spanish Surface Longline Fishery Targeting Swordfish in the Atlantic Ocean During the Period 1990–2015.' (2017), available at https://www.iccat.int/Documents/CVSP/CV069_2013/n_4/CV069041657.pdf.

ICCAT, ICCAT Secretariat, Report for Biennial Period 2018–19, Part I (2019), available at https://www.iccat.int/Documents/BienRep/REP_EN_18-19_I-1.pdf.

ICCAT, Report of the Independent Performance Review of ICCAT (2016), available at: https://www.iccat.int/documents/other/0-2nd_performance_review_tri.pdf.

ICCAT, SCRS, Report – Panel 4. Swordfish. Billfishes. Sharks. Small tunas. Presentation of the 2021 (2021), available at <https://www.iccat.int/Documents/SCRS/Presentation/2021/Panel4-2021.pptx>.

ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting (2019) available at https://www.iccat.int/Documents/Meetings/Docs/2019/REPORTS/2019_SMA_SA_ENG.pdf.

ICCAT, Shark Species Group, Report of the 2019 Shortfin Mako Shark Stock Assessment Update Meeting (2019) available at https://www.iccat.int/Documents/Meetings/Docs/2012_Shk_ASS_Eng.Pdf

ICCAT/SRDCP, Report of the Shark Research and Data Collection Programme. Activity report for the period October 2021 - September 2022 (2022), available at: https://www.iccat.int/Documents/Meetings/Docs/2022/REPORTS/2022_SCRS_ENG.pdf.

ICCAT Shark Species Group, Inter-Sessional Meeting of the Sharks Species Group (2013) available at: https://www.iccat.int/Documents/Meetings/Docs/2013_SHK_INTER-SESS_ENG.pdf

ICCAT, Report of the Standing Committee on Research and Statistics (2010), available at: https://www.iccat.int/documents/meetings/docs/2010_scrs_eng.pdf.

ICCAT, Coelho R, Santos CC, Rosa D, ‘Assessing the effects of hook, bait and leader type as potential mitigation measures to reduce bycatch and mortality rates of shortfin mako: a meta-analysis with comparisons for target, bycatch and vulnerable fauna interactions,’ (2009)

ICCAT, Courtney D, Kai M, Rice J, Stock synthesis projections at alternative fixed fishing mortality rates to evaluate the effect of live release for North Atlantic Shortfin Mako (2020).

ICCAT, Chair’s Report of the 1st Joint Tuna RFMO Bycatch Working Group Meeting (2019), available at: https://www.iccat.int/Documents/meetings/docs/2019/reports/2019_JWGBY-CATCH_ENG.pdf.

ICCAT, Honda H et al ‘A Trial Evaluation of the Effectiveness of the Use of Circle Hooks to Reduce Mortality of Shortfin Mako Shark in Pelagic Longline Fisheries Mortality of Shortfin Mako Shark on Circle Hooks vs J-Hooks’ (2018).

ICCAT Recommendation 02-31, GEN.

ICCAT Recommendation 03-10, BYC

ICCAT Recommendation 04-10, BYC

ICCAT Recommendation 08-09, GEN.

ICCAT Recommendation 10-06, BYC

ICCAT Recommendation 13-10, BYC.

ICCAT Recommendation 14-06, BYC.

ICCAT Recommendation 16-14, GEN.

ICCAT Recommendation 16-17, GEN

ICCAT Recommendation 17-08, BYC.

ICCAT Recommendation 18-06, BYC.

ICCAT Recommendation 19-06, BYC.

ICCAT Recommendation 19-09, GEN.

ICCAT Recommendation 21-09, BYC.

ICCAT Recommendation 21-13, GEN

ICCAT Recommendation 21-15, GEN.
ICCAT Recommendation 22-01, TROP
ICCAT Recommendation 22-11, BYC.
ICCAT Recommendation 75-02, GEN.
ICCAT Recommendation 93-08, MISC.
ICCAT Recommendation 98-01, TROP
ICCAT Recommendation 98-11, GEN.
ICCAT Resolution 02-29.
ICCAT Resolution 03:10, BYC.
ICCAT Resolution 95-2, SKS & Bycatch.

NEAFC

NEAFC Recommendation 10:2015.
NEAFC Recommendation 19:2014.
NEAFC Recommendation 7:2020.
NEAFC Recommendation 8:2020.
NEAFC Recommendation 9:2020.
NEAFC Scheme of Control and Enforcement. Available online:
<https://www.neafc.org/scheme/contents> (accessed on 14.08.2023).

NAFO

NAFO Annual Fisheries and Compliance Review (2020) NAFO/COM Doc. 20-17.
NAFO Conservation and Enforcement Measures (2023) N7368.
NAFO SCS, Report of the Scientific Council, (2018) 18/19, available at:
<https://www.nafo.int/Portals/0/PDFs/sc/2018/scs18-19.pdf>.
NAFO, Annual Fisheries and Compliance Review, *Compliance Report for Fishing Year 2021* (2022) 22-18, available at: <https://www.nafo.int/Portals/0/PDFs/COM/2022/comdoc22-18.pdf>.
NAFO, Meeting Proceedings of the Commission, *1 September 2020–31 August 2021* (2022) 2521-7623, available at: <https://www.nafo.int/Portals/0/PDFs/mp/2021-2022/MP-2021-2022.pdf>.
NAFO, Report of the Scientific Council, *01-14 June 20-18* (2018) 18/19, available at:
<https://www.nafo.int/Portals/0/PDFs/sc/2018/scs18-19.pdf>.

Other

NOAA. Bigelow K, Rice J and Carvalho F, 'Future Stock Projections of Oceanic Whitetip Sharks in the Western and Central Pacific Ocean' *PIFSC data report* (2022).
Anderson D et al, Recommended best practices for RFMOs. Report of an independent panel to develop a model for improved governance by Regional Fisheries Management Organization (Chatham House London 2007).

Scientific, Technical and Economic Committee for Fisheries, Alvaro JA et al 'Review of the implementation of the shark finning regulation and assessment of the impact of the 2009 European Community Action Plan for the Conservation and Management of Sharks' (2019) STECF-19-17.

VII. Internet Sources

EFCA on ICCAT, <https://www.efca.europa.eu/en/content/iccat>.

EFCA on NAFO, <https://www.efca.europa.eu/en/content/nafo>.

EFCA on NEAFC, <https://www.efca.europa.eu/en/content/neaftc>.

Encyclopedia Britannica, 'Sharks, rays, and skates,'
<https://www.britannica.com/animal/chondrichthian>.

FAO. Database of measures on conservation and management of sharks. Shortfin mako sharks, <https://www.fao.org/ipoa-sharks/database-of-measures/en/>.

FAO. Glossary. Fishing Mortality, <http://www.fao.org/fi/glossary/default.asp>

ICCAT Contracting Parties, <https://www.iccat.int/en/contracting.html>.

ICCAT Secretariat, 'ICCAT Manual. 1.1. What is ICCAT,'
<https://www.iccat.int/Documents/SCRS/Manual/CH1/CH1-ENG.pdf>.

ICCAT Secretariat, 'ICCAT Manual. 2.2.1 Sharks,'
https://www.iccat.int/Documents/SCRS/Manual/CH2/2_2_1_2_SMA_ENG.pdf.

NAFO Convention Area, <https://www.nafo.int/About-us/Maps>.

NAFO Contracting Parties, <https://www.nafo.int/About-us/Overview-of-NAFO>.

NEAFC Convention Area, https://www.neafc.org/system/files/neaftc-conv-and-ra_0.jpg.

NEAFC Contracting Parties, <https://www.neafc.org/>.

