

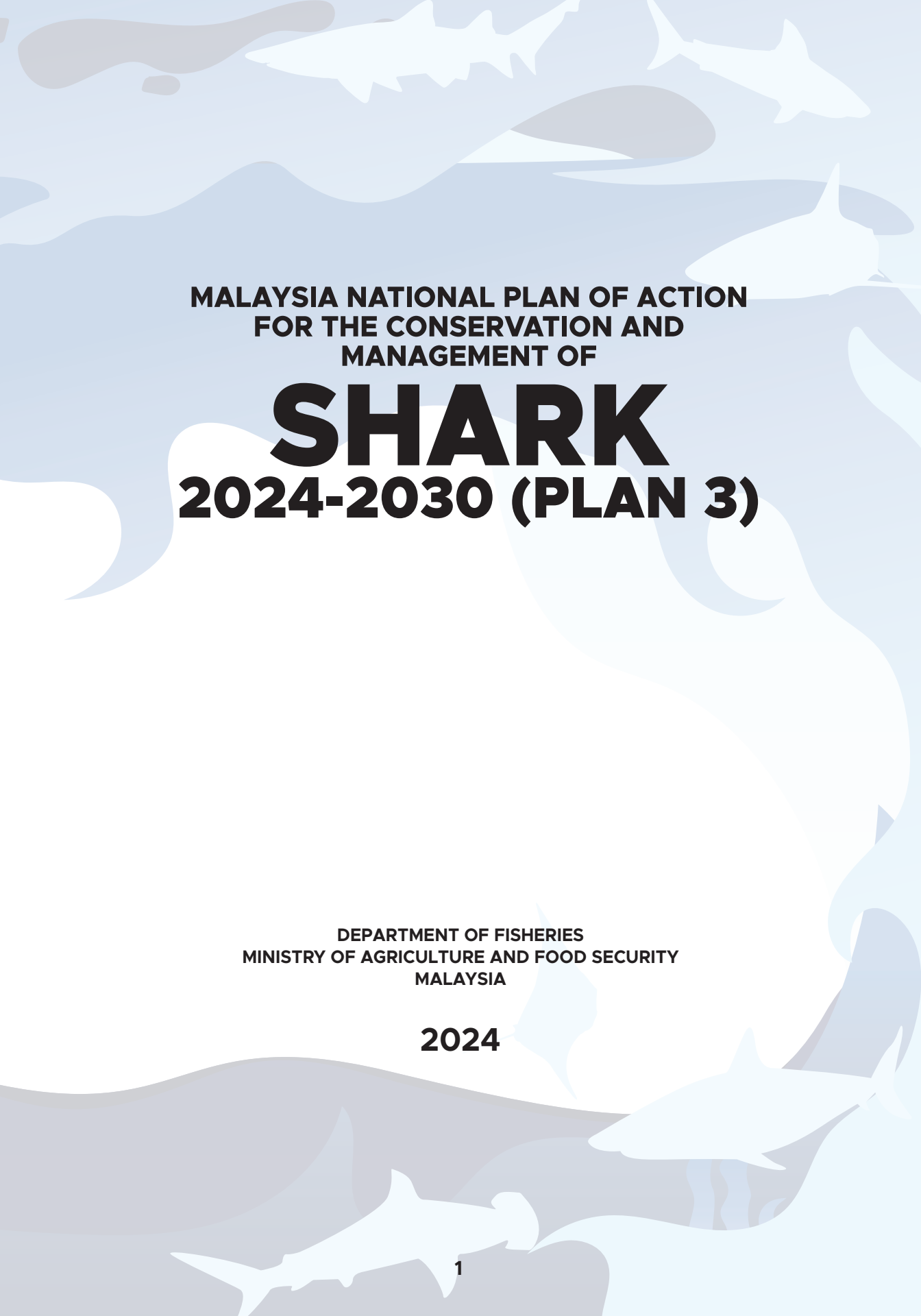


MINISTRY OF AGRICULTURE  
AND FOOD SECURITY  
DEPARTMENT OF FISHERIES MALAYSIA



MALAYSIA NATIONAL PLAN OF ACTION  
FOR THE CONSERVATION AND  
MANAGEMENT OF

**SHARK**  
**2024-2030 (PLAN 3)**



**MALAYSIA NATIONAL PLAN OF ACTION  
FOR THE CONSERVATION AND  
MANAGEMENT OF**

# **SHARK**

**2024-2030 (PLAN 3)**

**DEPARTMENT OF FISHERIES  
MINISTRY OF AGRICULTURE AND FOOD SECURITY  
MALAYSIA**

**2024**

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# SUMMARY

**MALAYSIA** has been very supportive of the International Plan of Action for Sharks (IPOA-SHARKS) developed by FAO that is to be implemented voluntarily by countries concerned. This led to the development of Malaysia's own National Plan of Action for the Conservation and Management of Shark or NPOA Shark in 2006 and NPOA Shark (Plan 2) in 2014. The successful development of Malaysia's third National Plan of Action for the Conservation and Management of Shark (Plan 3) is manifestation of her renewed commitment to the continuous improvement of shark conservation and management measures in Malaysia. For the purpose of this document, the term 'shark' refers to all chondrichthyan or cartilaginous fishes, comprising sharks, skates, rays and chimaeras.

Lesson learnt through the implementation of Plan 2 were used as the basis for the development of Plan 3. In Plan 3, 19 issues were identified and clustered under six broadly defined practical Action Plans.

Plan 3 is divided into four chapters.

## CHAPTER 1

- A review of NPOA Shark (Plan 2). A description of why Plan 3 is developed and how it will be implemented.
- List of overall objectives.

## CHAPTER 2

- A general overview of Malaysian fisheries.
- Trade of sharks and rays and their products.
- The status of sharks and rays resources in Malaysian waters.
- Relevant Rules and Regulations.

## CHAPTER 3

- A review of Plan 2 and the recommendations for improvement.
- A description of Plan 3.

## CHAPTER 4

- Monitoring and evaluation

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## LIST OF ACRONYMS

<b>ASEAN</b>	Association of Southeast Asian Nations
<b>ASEAN-WEN</b>	Association of Southeast Asian Nations - Wildlife Enforcement Network
<b>BOBLME</b>	Bay of Bengal Large Marine Ecosystem
<b>CITES</b>	Convention on International Trade in Endangered Species of Wild Flora and Fauna
<b>CTI</b>	Coral Triangle Initiative
<b>DOF</b>	Department of Fisheries Malaysia
<b>DOFS</b>	Department of Fisheries Sabah
<b>EEZ</b>	Exclusive Economic Zone
<b>FAO</b>	Food and Agriculture Organisation
<b>FDAM / LKIM</b>	Fisheries Development Authority of Malaysia / Lembaga Kemajuan Ikan Malaysia
<b>IPOA</b>	International Plan of Action
<b>ISMAT</b>	Institut Sumber Marin Asia Tenggara
<b>IUU</b>	Illegal, Unreported and Unregulated Fishing
<b>MAQIS</b>	Malaysian Quarantine and Inspection Services
<b>MOSTI</b>	Ministry of Science, Technology and Innovation
<b>NPOA</b>	National Plan of Action
<b>NRES</b>	Ministry of National Resources and Environmental Sustainability
<b>SEAFDEC</b>	Southeast Asian Fisheries Development Center
<b>SEAFDEC/MFRDMD</b>	Southeast Asian Fisheries Development Center / Marine Fishery Resources Development and Management Department

# FOREWORD

## BY THE HONOURABLE MINISTER OF AGRICULTURE AND FOOD SECURITY MALAYSIA

Assalamualaikum wbt, Salam Sejahtera and Salam Malaysia Madani

**I WOULD** like to extend my deepest appreciation to everyone involved in the preparation of the NPOA Shark Plan 3. This plan signifies Malaysia's ongoing commitment to ensuring the sustainable conservation and management of shark in line with international principles. This document represents not just a strategy, but a testament to our commitment to preserving the rich biodiversity that is essential to our environment and future. It aligns with the mission of the Madani Government, which is dedicated to developing a prosperous, inclusive, and progressive nation, emphasizing humanitarian values, social justice, and the well-being of the people.

Malaysia recognizes the importance of international cooperation in the long-term conservation and sustainable use of shark species. Therefore, we fully support the International Plan of Action (IPOA-SHARKS) developed by the FAO, which is implemented voluntarily by the involved countries. In this era of globalization and digitalization, this action plan serves as a holistic and strategic guide, enabling us to face challenges with greater confidence and preparedness.

I would also like to recognize the efforts of our dedicated teams who worked tirelessly to gather data, conduct assessments, and formulate actionable strategies. Your hard work and commitment to protecting our natural heritage are commendable. This plan is a call to action, urging all of us to collaborate, innovate, and invest in the future of our threatened species. Together, we can ensure that our ecosystems remain vibrant and resilient for generations to come.

I hope that this book, "National Plan of Action (NPOA Plan 3) for the Conservation and Management of Shark 2024-2030" will serve as an effective guide in our efforts to build a prosperous, thriving, and harmonious nation. Let us work together and strive to realize this vision for the well-being of our people and the prosperity of our country.

Thank you

**DATUK SERI HAJI MOHAMAD BIN SABU**  
Minister of Agriculture and Food Security Malaysia  
PUTRAJAYA



# FOREWORD

## FROM THE SECRETARY GENERAL MINISTRY OF AGRICULTURE AND FOOD SECURITY MALAYSIA

**I**n alignment with the International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS), Malaysia's National Plan of Action for the Conservation and Management of Shark (NPOA Shark) has been created to consider both local circumstances and global conservation perspectives. Importantly, shark in Malaysia are mainly caught by trawlers, and advancements in processing technology have enabled their complete utilization.

The Department of Fisheries Malaysia is committed to effective fisheries management, including shark conservation. In addition to national initiatives, Malaysia actively participates in regional and international projects aimed at enhancing data collection on shark landings and providing training in shark taxonomy and biology. The previous Plan 2 incorporated performance indicators for progress measurement, and Plan 3 introduces annual reviews to strengthen monitoring and prioritize action plans. I believe these improvements will help achieve both short-term and long-term objectives.

At the international level, Malaysia recognizes the recent developments from the Conference of the Parties (CoP19) to the Convention on International Trade in Endangered Species (CITES) in Panama in 2022, which included the adoption of proposals to list additional sharks and rays under CITES. This will impact cross-border trade and necessitate increased capacity building for relevant authorities, along with enhanced public awareness. I would like to extend my gratitude to everyone who contributed to making Plan 3 a reality.

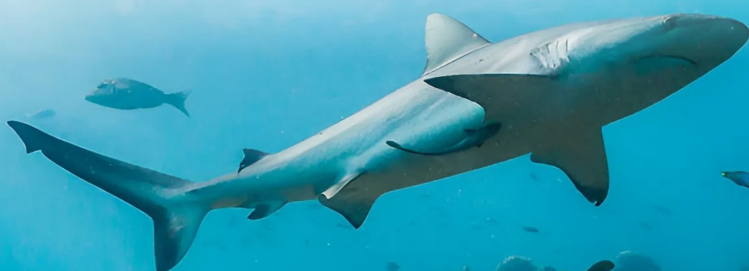
As we move forward, let us remember the importance of international cooperation in the conservation of shark species. This action plan serves as a strategic guide, empowering us to face challenges with confidence. I hope this book will guide our efforts toward building a prosperous, inclusive, and harmonious nation, despite the challenges posed by the COVID-19 pandemic. Thank you for your unwavering support in this vital endeavor.

Thank you.

### **DATUK SERI ISHAM BIN ISHAK**

Secretary General

Ministry of Agriculture and Food Security Malaysia  
PUTRAJAYA



# MESSAGE

## FROM THE DIRECTOR GENERAL OF FISHERIES MALAYSIA

I AM pleased to acknowledge the collective effort that has culminated in the National Plan of Action for the Conservation and Management of Shark (Plan 3). Alhamdulillah, we are grateful to Allah SWT for His grace that has enabled us to publish this book. This book is a testament to our commitment to preserving the rich biodiversity essential for our environment and future. I extend my heartfelt gratitude to all stakeholders—scientists, conservationists, local communities, and governmental agencies—whose expertise and dedication have been invaluable in shaping this plan.

Malaysia's third National Plan of Action for the Conservation and Management of Shark demonstrates the country's ongoing commitment to the conservation and sustainable management of shark. Building on the previous plan, which concluded its operational period in 2018, Plan 3 aims to enhance the implementation of conservation measures by incorporating lessons learned from the second plan. It highlights critical elements such as monitoring and key performance indicators, while also acknowledging the need to improve data collection and capacity building. Additionally, Plan 3 seeks to address negative perceptions of shark fishing in Malaysia through increased public awareness and education initiatives. Regular monitoring of progress will be conducted through annual reviews throughout the duration of Plan 3.

Effective shark conservation and management in Malaysia requires balancing ecological, social, and economic objectives. To achieve this, we will consider the interests of all stakeholders through a series of consultations. I wish to express my sincere gratitude to the Review Team for their timely efforts in making Plan 3 a reality, reflecting the opinions and interests of all involved. Thank you to the staff of the Department of Fisheries Malaysia, other supporting agencies, and the NGOs whose contributions have greatly enriched this plan.

Thank You

### **DATO' HAJI ADNAN BIN HUSSAIN**

Director General  
Department of Fisheries Malaysia  
PUTRAJAYA





## ACKNOWLEDGEMENTS

**THE** Review Team for the National Plan of Action for the Conservation and Management of Shark would like to take this opportunity to express our gratitude to The Hon. Datuk Seri Haji Mohamad bin Sabu, Minister of Agriculture and Food Security Malaysia; Datuk Seri Isham bin Ishak, Secretary General of the Ministry of Agriculture and Food Security; and The Hon. Dato' Haji Adnan bin Hussain, Director General of Fisheries Malaysia, for their guidance, support, and encouragement in the development of this document.

We also wish to extend our sincere thanks to Deputy Director General of Fisheries (Management), Deputy Director General of Fisheries (Development), as well as the Directors and senior officers of the Department of Fisheries Malaysia for their constructive feedback and suggestions during the preparation of this plan.

Additionally, we acknowledge the contributions of various stakeholders who actively participated in the consultation process. Finally, we appreciate all the agencies, departments, and individuals who provided valuable assistance and insights in the creation of this document.



## MEMBERS OF MALAYSIA NPOA-SHARK (PLAN 3) WORKING GROUP

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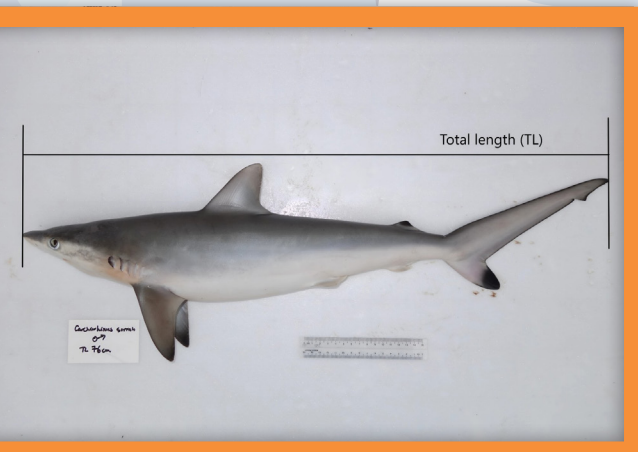
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Mr. Mohd Nur Aminullah bin Abu Bakar

Mr. Hilal bin Abd. Aziz



“Typical measurement of the disc length (DL) for rays, and total length (TL) for sharks.”

# CHAPTER 1





## PREAMBLE

**MALAYSIA** has documented its diverse marine life, boasting at least 65 species of sharks and 81 species of rays. These figures were updated and revised based on the latest references, namely Last et al. (2016a), FishBase (Froese & Pauly, 2024), and DNA identification studies (Lim *et al.* 2022, Loh *et al.* 2023).

While not specifically targeted by Malaysian fishers, shark are unintentionally captured alongside other commercially significant species. In Malaysia, shark are fully utilized, being consumed as traditional food and employed in various food processing applications. Recognized as apex predators, shark play a crucial role in preserving biodiversity, and their depletion can set off cascading effects throughout ecosystems. Unfortunately, shark are particularly vulnerable to overfishing due to their slow growth, delayed reproduction compared to other fish, and limited offspring production. As a consequence, their populations recover slowly when exposed to rapid rates of fishing or other threats. Currently, scientists estimate that one-quarter of shark species, along with their ray and chimaera relatives, are at risk of extinction, according to the International Union for Conservation of Nature (IUCN) Red List criteria.

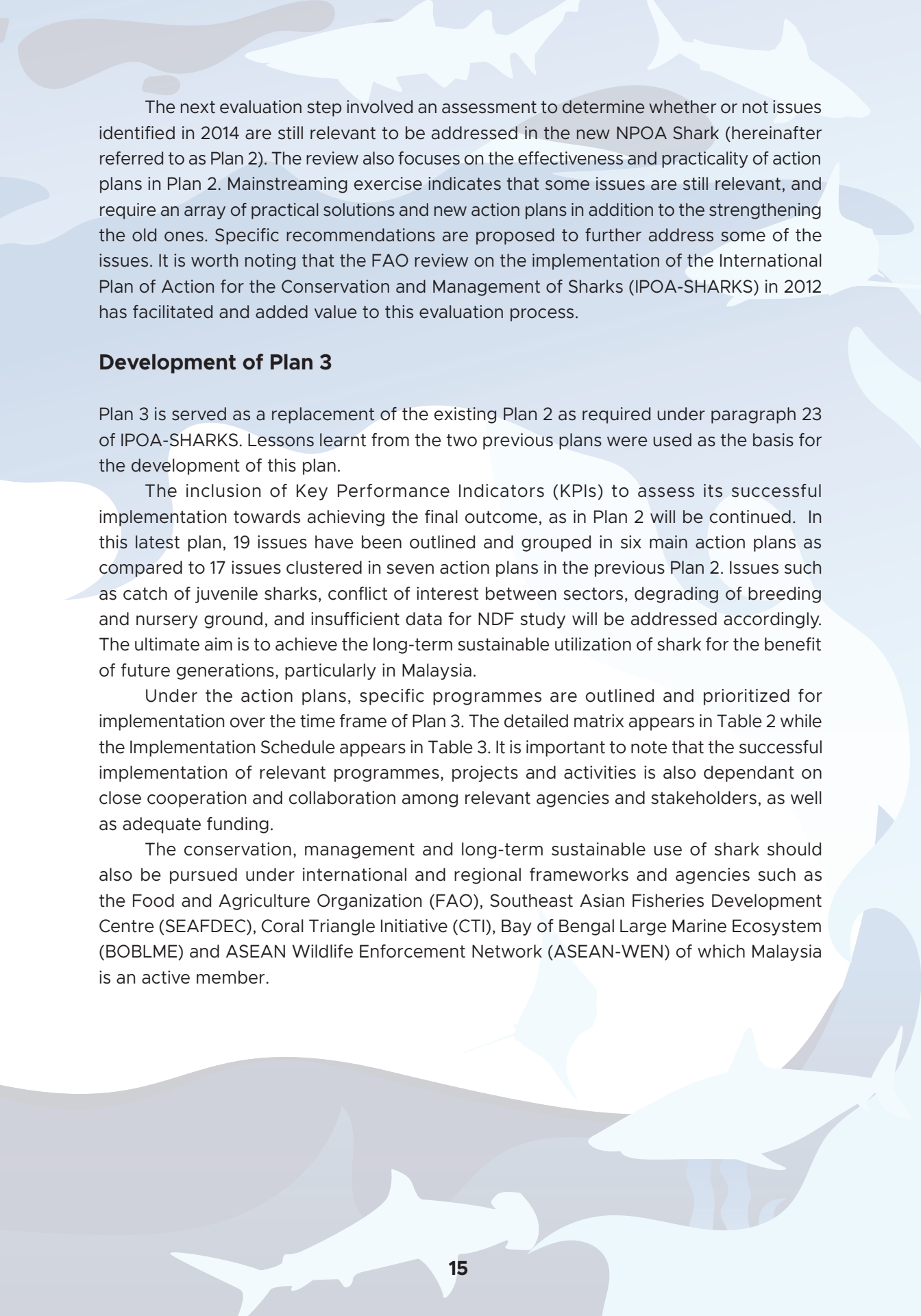
Given the migratory nature of most shark and their vulnerability to various fishing gears, it is imperative to implement effective management strategies for shark fisheries to minimize adverse impacts on these crucial resources. In response to this imperative, Malaysia took a proactive step by formulating the National Plan of Action for Shark (NPOA Shark). Pioneering this initiative in Southeast Asia, Malaysia introduced NPOA Shark (Plan 1) in 2004, aligning with the FAO's International Plan of Action for Conservation and Management of Sharks (IPOA-SHARKS). The operational period for NPOA Shark Plan 1 spanned from 2006 to 2010. Subsequently, NPOA-Shark Plan 2 was published in 2014, operationalizing from 2014 to 2018. Building on these efforts, NPOA Shark Plan 3 was unveiled in 2024, signifying the continuous commitment to sustainably manage and conserve shark populations in Malaysian waters. This latest plan is set to be operational from 2024 to 2030.



## REVIEW

### Review of NPOA Shark (Plan 2)

**PARAGRAPH 23** of IPOA-SHARKS requires member States to conduct assessment of the implementation of their NPOA Shark at least once in every four years. In accordance with this, an evaluation was conducted to assess the implementation of Plan 2 in terms of action taken against the action plans. Plan 2 identified seven main action plans by including Key Performance Index (KPI) to enable better performance evaluation. The main action plans are improvement of data collection, rectifying the negative perception on sharks and rays, intensifying capacity building, strengthening management and conservation, strengthening law and enforcement, comprehensive and coordinated research and lastly, securing funding. The detailed evaluation appears in Table 1.



The next evaluation step involved an assessment to determine whether or not issues identified in 2014 are still relevant to be addressed in the new NPOA Shark (hereinafter referred to as Plan 2). The review also focuses on the effectiveness and practicality of action plans in Plan 2. Mainstreaming exercise indicates that some issues are still relevant, and require an array of practical solutions and new action plans in addition to the strengthening the old ones. Specific recommendations are proposed to further address some of the issues. It is worth noting that the FAO review on the implementation of the International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS) in 2012 has facilitated and added value to this evaluation process.

### **Development of Plan 3**

Plan 3 is served as a replacement of the existing Plan 2 as required under paragraph 23 of IPOA-SHARKS. Lessons learnt from the two previous plans were used as the basis for the development of this plan.

The inclusion of Key Performance Indicators (KPIs) to assess its successful implementation towards achieving the final outcome, as in Plan 2 will be continued. In this latest plan, 19 issues have been outlined and grouped in six main action plans as compared to 17 issues clustered in seven action plans in the previous Plan 2. Issues such as catch of juvenile sharks, conflict of interest between sectors, degrading of breeding and nursery ground, and insufficient data for NDF study will be addressed accordingly. The ultimate aim is to achieve the long-term sustainable utilization of shark for the benefit of future generations, particularly in Malaysia.

Under the action plans, specific programmes are outlined and prioritized for implementation over the time frame of Plan 3. The detailed matrix appears in Table 2 while the Implementation Schedule appears in Table 3. It is important to note that the successful implementation of relevant programmes, projects and activities is also dependant on close cooperation and collaboration among relevant agencies and stakeholders, as well as adequate funding.

The conservation, management and long-term sustainable use of shark should also be pursued under international and regional frameworks and agencies such as the Food and Agriculture Organization (FAO), Southeast Asian Fisheries Development Centre (SEAFDEC), Coral Triangle Initiative (CTI), Bay of Bengal Large Marine Ecosystem (BOBLME) and ASEAN Wildlife Enforcement Network (ASEAN-WEN) of which Malaysia is an active member.



## OVERALL OBJECTIVES

**THE** overall objective of the NPOA-Shark is to ensure the conservation and effective management of sharks and rays and their long-term sustainable use, as outlined in the FAO IPOA-SHARKS which aims to:

- Ensure that shark and ray catches are sustainable;
- Assess threats to shark and ray populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term economic use;
- Identify and provide special attention in particular to vulnerable or threatened shark and ray stocks;
- Develop and improve the framework for establishing and coordinating effective consultation involving stakeholders in research, management and educational initiatives within and between States;
- Minimise unutilised incidental catches of shark and ray;
- Contribute to the protection of biodiversity and ecosystem structure and functions;
- Minimise waste and discards from shark and ray catches accordance with Article 7.2.2 (g) of the Code of Conduct for Responsible Fisheries (for example, requiring the retention of shark from which fin are removed);
- Encourage full use of dead shark and ray;
- Facilitate improved species-specific catch and landing data and monitoring of shark and ray catches; and
- Facilitate the identification and reporting of species-specific biological and trade data.

# CHAPTER 2





## GENERAL OVERVIEW OF MALAYSIAN FISHERIES

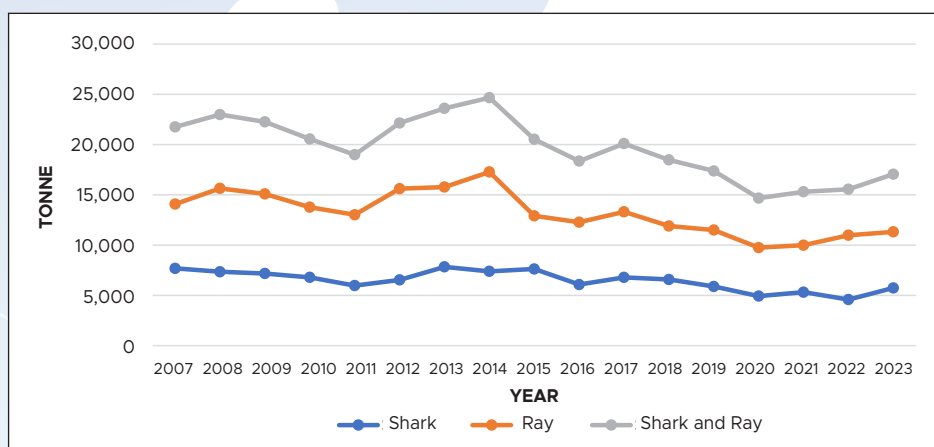
**THE** fisheries sector in Malaysia plays a significant role in supporting the country's economic growth through the provision of employment as well as the supply of proteins as food to the population. In 2023, the total food fish production amounts to 1,786,579 mt valued at US\$ 3.6 billion<sup>1</sup>. This contributed to about 0.7% of the Gross Domestic Product (GDP) and provided direct employment to 112,344 fishers and 20,688 fish aquaculturists (Annual Fisheries Statistics, 2023).

The fishing area for marine capture fisheries covers a total of 547,200 km<sup>2</sup>. Malaysian marine capture fisheries are categorized into coastal and deep-sea fisheries. In 2023, coastal fisheries contributed 1,101,765 mt (87%) while deep-sea fisheries contributed 168,511 mt (13%) to the total marine landings.

Shark and ray, that constitute part of the demersal fishery landings, are caught in Malaysian waters from the coast to the edge of the EEZ. The landings from 1997-2018 contributed between 1.2-1.7%, with an average of 1.4% of the total marine landings. Shark are not targeted by fishers but are caught together with other commercially important species. They are brought back whole to the port and sold at reasonable prices, with the fins fetching a better price. Similarly, rays are caught and sold at reasonable prices. Sharks and rays are mainly caught by trawls, gillnets, and hooks and lines.

### Landings of Sharks and Rays in Malaysia

The annual landings of sharks and rays fluctuated from 24,765 mt in 1997 to 17,054 mt in 2023. The highest landings were in 2003 at 27,948 mt while the lowest landings were in 2020 at 14,674 mt. The highest landing for sharks was recorded in 2005 at 9,165 mt and rays in 2003 at 19,253 mt (Figure 1).



**Figure 1:** Trends of landings (mt) of sharks and rays in Malaysia

Source: Annual Fisheries Statistics (2007 - 2023)

<sup>1</sup>Conversion rate US\$ 1 = RM 4.59



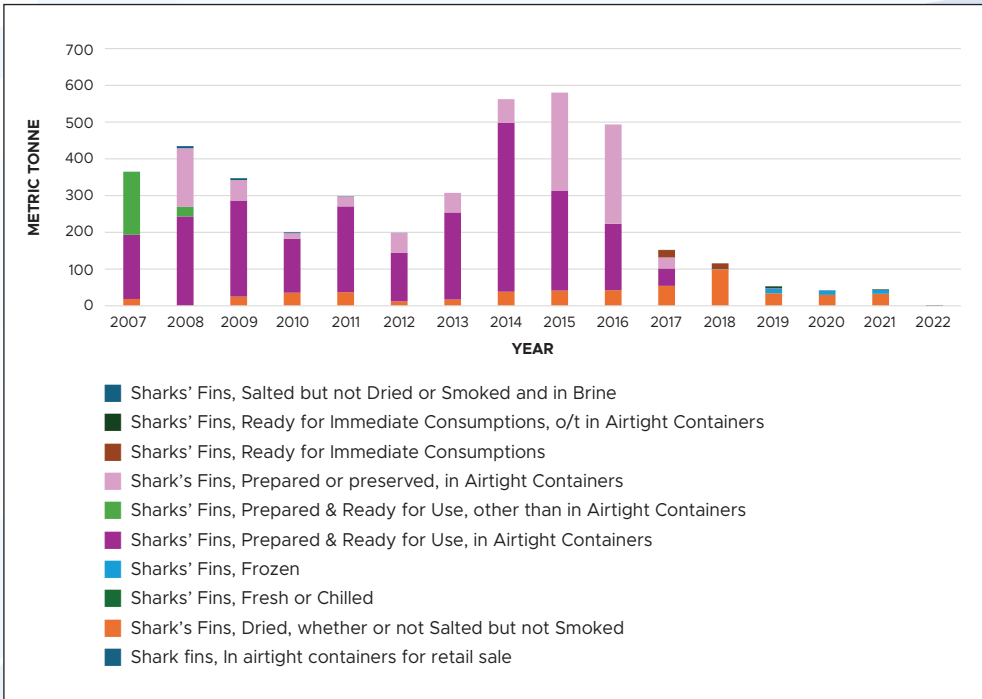
## TRADE OF SHARKS AND RAYS AND THEIR PRODUCTS

### Exports and Imports of Sharks Products

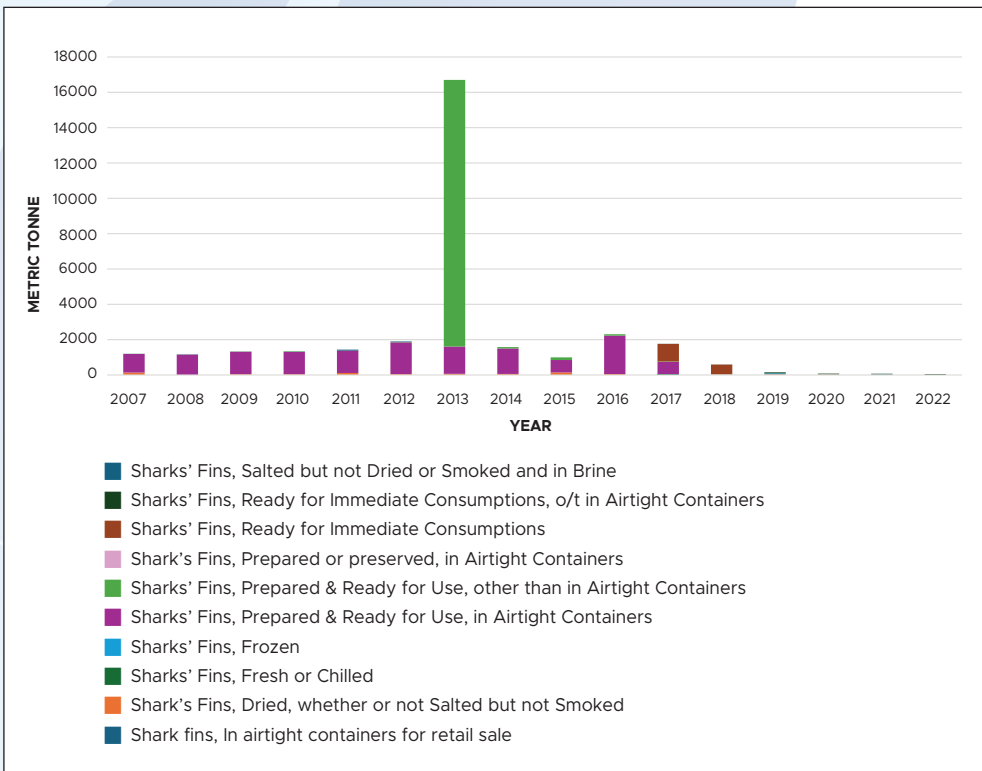
**THERE** are seven shark's fin products and three other shark products which are traded in Malaysia. The Annual Fisheries Statistics and Customs Code do not differentiate the various species of sharks that are being traded. Data concerning these products are only available under the general headings of;

- Dogfish and other sharks, excluding livers and roes, fresh or chilled
- Dogfish and other sharks, excluding livers and roes, frozen
- Dogfish and other sharks, rays and skates, fillets, frozen
- Shark fins, dried, whether or not salted but not smoked
- Shark fins, salted but not dried or smoked and in brine
- Shark fins prepared and ready for use and in airtight containers
- Shark fins, prepared and ready for use, other than in airtight containers
- Shark fins, prepared or preserved, in airtight containers
- Shark fins, frozen
- Shark fins, ready for immediate consumptions

A total of 4,094 mt shark fins products were exported from 2007-2022 with an average of 255 mt/year. For the same product, Malaysia imported 32,661 mt with an average of 2,041 mt/year during the same period. Overall, there is a steady increase in the trends of the quantities of exports and imports of shark fins products from 2007-2009 then fluctuated slightly from 2010-2017. Less data recorded in 2018-2022 may be due to the exporter did not declare the goods according to the original code or declared using another code or the product was not available. (Figure 2 and Figure 3).



**Figure 2:** Trends of quantities (mt) of exports of shark fins trade code, 2007-2022



**Figure 3:** Trends of quantities (mt) of imports of shark fins trade code, 2007-2022



The export values of shark fins also fluctuated which was more or less similar to the trend of the quantities being exported for the year 2007-2022 (Figure 4).

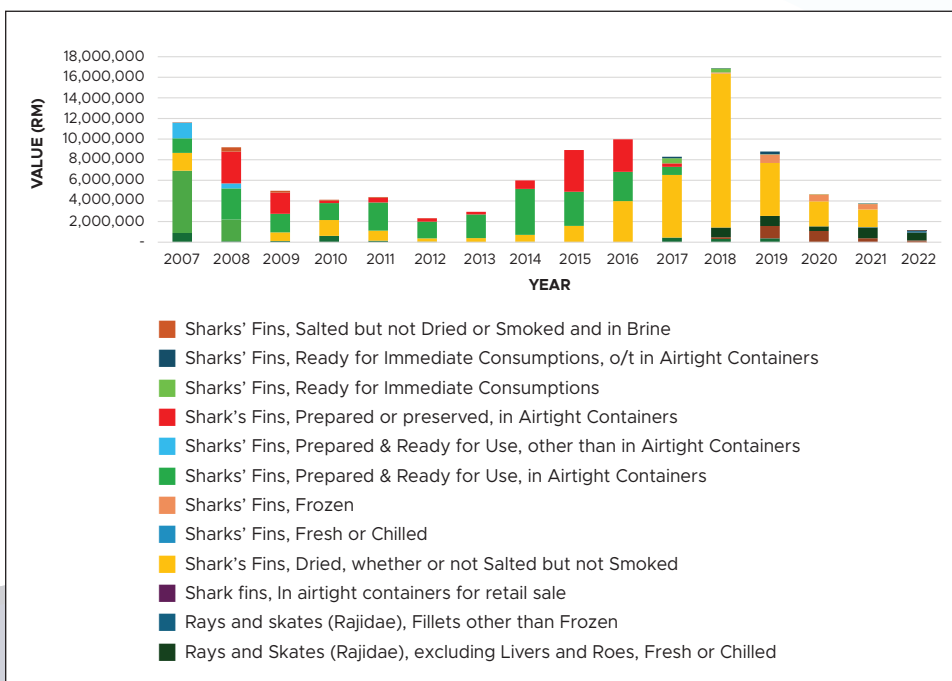


Figure 4: Trends of export value (RM) of shark fins trade code, 2007-2022



The import values of shark fins, prepared and ready for use in airtight containers, for the year 2007-2021 showed a fluctuated trend which was similar to that of the quantities imported (Figure 5).

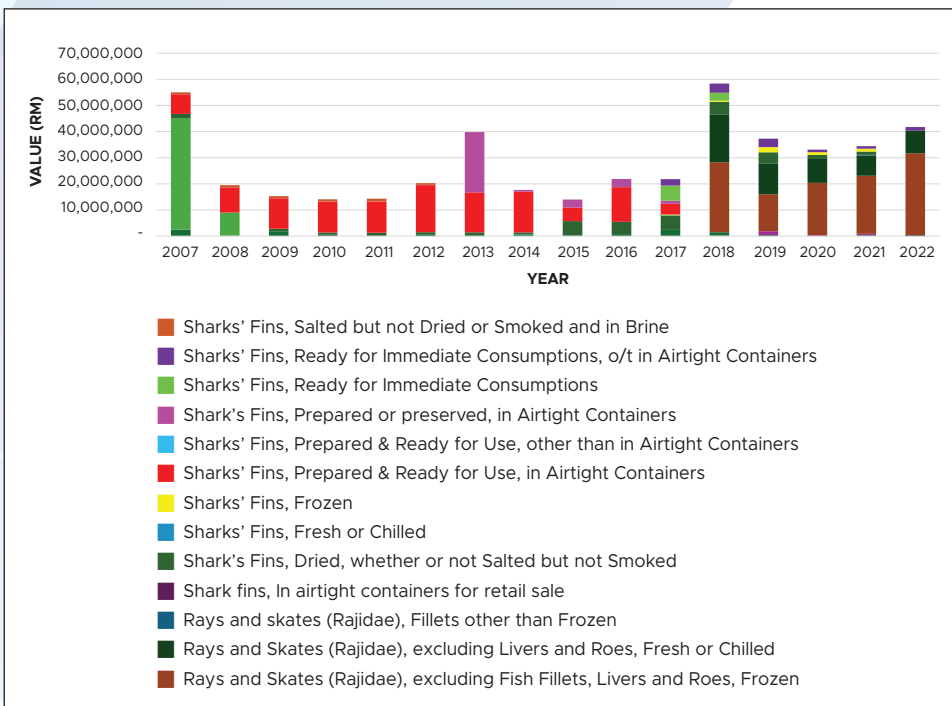
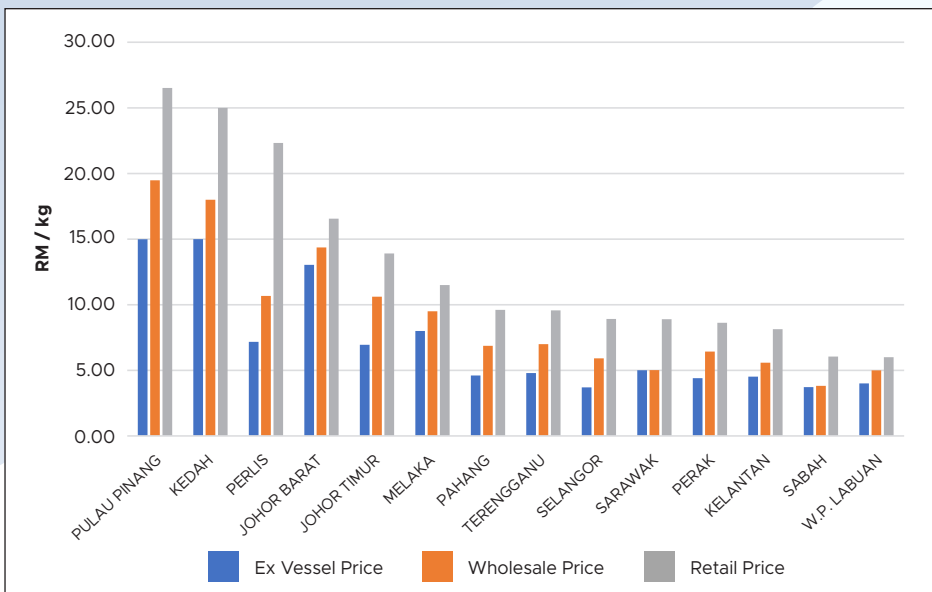


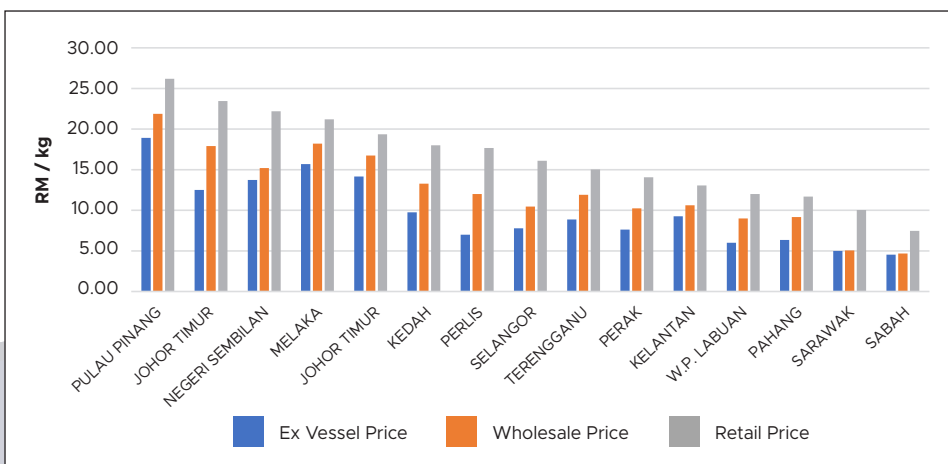
Figure 5: Trends of import value (RM) of shark fins trade code, 2007-2022

The average prices per kilogram for sharks were RM7.14 (ex-vessel), RM9.16 (wholesale) and RM12.97 (retail) respectively. The State of Pulau Pinang registered the highest average ex-vessel, wholesale and retail prices at RM14.99/kg, RM19.48/kg and RM26.52/kg respectively. In the northern States such as Kedah, Perlis and Pulau Pinang, sharks fetched a higher price compared to other States due to the greater demand by the locals (Figure 6).



**Figure 6:** Trends of average prices (RM) of sharks by States in Malaysia in 2023

The average prices per kilogram for rays were RM9.81 (ex-vessel), RM12.42 (wholesale) and RM16.50 (retail) respectively. The State of Pulau Pinang recorded the highest average ex-vessel at RM18.92/kg and the highest average wholesale prices at RM 21.88/kg and average retail price of RM26.19/kg (Figure 7).



**Figure 7:** Trends of average prices (RM) of rays by States in Malaysia in 2023

## Marketing of Sharks and Rays in Perak, Pahang, Sabah & Sarawak, Malaysia

The studies are conducted by the Institute of Agricultural and Food Policy Studies, Universiti Putra Malaysia (IKDPM, UPM) in collaboration with the Marine Fishery Resources Development and Management Department (MFRDMD) from 2015 to 2019. The main objective of the studies is to explore the status and trends of shark and ray utilisations, and marketing in the state of Perak, Pahang, Sabah and Sarawak (Table 1). The findings of these studies are useful to serve as an essential basis for developing appropriate fisheries management policies and actions, and thereby promote national responsibility for sharks and rays resource management issues.

**Table 1:** List of states and districts that are involved in the marketing studies

PAHANG	PERAK	SABAH	SARAWAK
Kuantan Pekan Rompin	Hilir Perak Larut Matang Manjung Kerian	Kota Kinabalu Sandakan Tawau Semporna	Kuching Tanjung Manis Mukah Miri Sibu Bintulu

Data on the marketing of sharks and rays are collected through key informant surveys (KIS) and focus group discussions (FGD) with relevant stakeholders who are involved in the activities. The stakeholders involved in both the KIS and FGD are the fishers, small time traders, wholesalers, processors, retailers (including restaurants, medicinal shops) and exporters.

In Pahang, sharks are consumed by local consumers in various forms. Kuantan is the central market for sharks and rays and the products are distributed through wholesalers to local markets as well as the markets outside the state that includes Melaka, Johor (Batu Pahat and Johor Bahru), Kuala Lumpur and Singapore. There are two processors of shark and ray products based in Beserah, Pahang. Both processors also do collect ray skins and export to Thailand through an agent that is based in Perak.

Whereas in Perak, the market system is even more direct where the wholesalers collect the fishes at the landing sites and sell most of them directly to the retailers. Major retailing markets are within the state itself such as in Sitiawan, Pantai Remis, Sungai Ular, Kampung Acheh, Telok Intan and Taiping. Out of state markets include those in Butterworth, Bukit Mertajam, Alor Setar, Kuala Lumpur, Johor Bahru, Batu Pahat and Selayang, Selangor and some rays are also exported to Singapore.

Market players in the two states seem to have a good marketing network to communicate on supply and prices. Majority of the wholesalers do own proper storage facilities to store fresh sharks and rays for distribution to major internal and external market destinations. In general, most of the sharks and rays are consumed locally in the fresh forms. However, there is also a number of small scale factories do produce various

value-added products such as dried cartilage of sharks, shark jaws and salted-dried meat. The demand for sharks and rays in both states for local consumptions are relatively strong.

In Sabah, based on the observation made on the domestic marketing of sharks and rays in selected areas suggest that the industry is responding to the market forces pretty well despite the location disadvantage. Considering that the products are bycatch which is irregular in term of harvest and size, its marketing system can be considered relatively efficient. The marketing channels are highly localised depending on the catch (volume and type) and local demand. For instance, in Kota Kinabalu, sharks are consumed by local consumers in various forms (including medicinal purposes). Some centres such as Sandakan, Tawau and Semporna, sharks and rays are either consumed locally or exported particularly on shark fin and large size sharks.

Popular export destinations are: Thailand, Singapore, Hong Kong and China. Whereas the internal market destinations are including Sibul, Johor Bahru and Selayang. The shark and ray product development were active in that fishers and traders are able to add value to their catch by various product transformations through drying, packaging and processing both for food and non-food purposes. The diversity of products and value added that they created indicate high degree of utilisation of shark carcasses by the fishers, processors and traders. Due to the unique properties of the shark and ray products, its marketing system is run by a wide range of intermediaries including: fishers, wholesalers, retailers (including those specialising in medicinal products), restaurants, exporters/importers and consumers.

Unlike Sabah, the marketing channel in Sarawak is more about the local demand and consumption that includes processing, delivering and selling products. The supply chain of sharks and rays in Sarawak is made up of fishers, wholesalers, fish collectors, fishmongers or retailers to consumers.

Overall, the fundamentals for sharks and rays are relatively strong particularly in the demand sector. The uniqueness of shark fin which is revered by Chinese consumers at large explains for its very high market value and hence incentives for the supply sector. The supply sector on the other hand may not be able to respond as fast as the demand and in fact it requires monitoring to ensure sustainability. The finning regulation has prompted the market for shark meat all over the world which minimizes wastage. Clearly interventions aim at conservation will have to balance the trilogy of the market, resources and environment in a sustainable manner.



## **STATUS OF SHARK AND RAY RESOURCES IN MALAYSIAN WATERS**

### **Sharks**

The NPOA Shark Plan 2, published in 2014, documented 63 shark's species. Ongoing studies and research conducted until 2024, have added seven more species, and removing five species, bringing the total to 65 species. These encompass seven orders and 20 families, namely Carcharhiniformes (eight families and 44 species), Heterodontiformes (one family

**Table 2:** Shark and Ray Species Listed Under the Fisheries (Control of Endangered Species of Fish) Regulations 1999

1999	2008	2019
<p><b>SHARK</b></p> <p><i>Rhincodon typus</i></p>	<p><b>SAWFISH</b></p> <p><i>Anoxypristis cuspidata</i>  <i>Pristis clavata</i>  <i>Pristis pectinata</i>  <i>Pristis pristis</i>  <i>Pristis zijsron</i>  <i>Pristis microdon</i>  <i>Pristis perotteti</i></p>	<p><b>SHARK</b></p> <p><i>Carcharhinus longimanus</i>  <i>Sphyrna zygaena</i>  <i>Sphyrna mokarran</i>  <i>Eusphyrna blochii</i></p> <p><b>RAY</b></p> <p><i>Mobula birostris</i>  <i>Mobula alfredi</i></p>

and one species), Hexanchiformes (one family and two species), Lamniformes (two families and four species), Orectolobiformes (five families and nine species), Squaliformes (two families and four species), and Squatiniformes (one family and one species).

Malaysia boasts rich shark biodiversity, covering 7 out of 9 orders (78%), 18 out of 37 families (54%), and 69 out of 536 species (11%) globally (Ebert *et al.* 2021). The newly added species include *Squalus edmundsi*, *Alopias superciliosus*, and *Carcharhinus amboinensis* (Loh *et al.*, 2023); *Carcharodon carcharias* (Duffy, 2016), *Carcharhinus tjtjot* (Arai & Azri, 2019), *Scoliodon laticaudus* (Lim *et al.*, 2022), and *Mustelus lenticulatus* (GenBank: PP195837 & PP195838).

Dominant shark species vary across different landing sites. The majority of sharks prefer the 'continental/insular shelves' as their habitat, with 38 species (62%) thriving within this environment. The 'shelf to slope' habitat follows as the second most important, harboring 11 species (16%). Other habitats for various species include 'freshwater,' 'shelf to oceanic,' 'continental/insular slopes,' 'shelf to semi-oceanic,' and 'euhaline'.

## Rays

Recently study confirmed the presence of at least 81 ray species, spanning four orders and 16 families, in Malaysian waters, including freshwater habitats. The updated recorded list of rays encompasses Myliobatiformes (eight families and 55 species), Rajiformes (two families and five species), Rhinopristiformes (four families and thirteen species), and Torpediniformes (two families and eight species). Notably, twelve species and two families have been added, including the freshwater stingray, *Fluvitrygon kittipongi*. A comprehensive study collected over 50 specimens of *F. kittipongi* from the Sungai Perak, *F. signifier* from Sungai Kelantan and Sungai Pahang and their streams, and *Urogymnus polylepis* from Terengganu, Johor and Sabah rivers.

This research highlights the rich biodiversity of rays in both freshwater and marine habitats in Malaysia. Over the past decade, numerous orders, families, and genera have undergone changes. For instance, the order Rhinopristiformes has replaced Pristiformes

(sawfishes) and Rhinobatiformes (wedgfishes and guitarfishes). Additionally, the family Glaucostegidae (giant guitarfishes) has been separated from the family Rhinobatidae (guitarfishes), and the genus *Glaucostegus* is now used for a group of guitarfish previously included in the genus *Rhinobatos* (e.g., *Glaucostegus typus* was formerly *Rhinobatos typus*).

The scale of recent taxonomic and nomenclatural changes is apparent; once diverse genera such as *Dasyatis* and *Himantura* (stingrays) have been divided into myriad new genera: *Brevitrygon*, *Fluvitrygon*, *Maculabatis*, *Pateobatis*, and others (Last *et al.* 2016). Identifying the Bluespotted Maskray, *Neotrygon spp.* previously under *Neotrygon kuhlii*, poses a significant challenge. *N. kuhlii* is not found in Malaysian waters. Subsequently, based on research by Borsa *et al.* (2016) and Last *et al.* (2016) revealed that the species previously identified as *N. kuhlii* in Malaysia actually reclassified into three distinct species: *N. varidensis*, *N. caeruleopunctata*, and *N. orientalis*.

Most rays prefer 'continental/insular shelves' as their habitat, with 62 species (76%) occurring within this habitat type. Other habitats for various species include 'shelf to oceanic,' 'shelf to slope,' 'euryhaline,' 'continental/insular slopes,' 'freshwater,' and 'oceanic.'



## RULES AND REGULATIONS

Malaysia's commitment in managing its shark and ray resources has been demonstrated through the documentation of Plan 1 and Plan 2. Malaysia also actively participates in regional and international fora related to the management and conservation of sharks and rays.

### Fisheries Act 1985

Under the Fisheries Act 1985, the Minister of Agriculture and Food Security of Malaysia is empowered to make regulations for the proper management of specific marine fisheries resources.

Currently the management of freshwater sharks and rays (elasmobranchs) is under the jurisdiction of the States. In order to improve the conservation and management of freshwater elasmobranchs, the Federal Government will propose to the State Governments to establish and include the management of freshwater sharks and rays in their State fisheries rules. The Federal Government also needs to work closely with the State authorities to harmonise rules.

Under the Fisheries (Control of Endangered Species of Fish) Regulations 1999, there are 25 species listed as endangered marine animals in Malaysia, including the Whale Shark. In 2008, seven additional species under the Family Pristidae (sawfishes) were listed as endangered species under the same regulations. In 2019, six additional species i.e. four species sharks and two species rays were listed under this regulation. The name of species: -

The regulations stipulate that no person shall fish or, disturb, harass, catch, kill, take, possess, sell, buy, export or transport any endangered species of fish including their parts except with the written permission from the Director General of Fisheries Malaysia.

To ensure sustainable exploitation of resources, restrictions on several methods of fishing are imposed under the Fisheries (Prohibition of Method of Fishing) Regulations 1980 and in Section 26 Fisheries Act 1985. These include the use of explosives, poisons or pollutants, the use of electric shocks and the use of pair trawls and push nets. The locally known 'pukat pari', a drift net with a mesh size of more than 25.4 cm (10 inches), which was once used to catch large sized sharks and rays has been banned since 1990. The banning of these gears and fishing methods nationwide helped to reduce the excessive exploitation of sharks and rays and to conserve their breeding stocks.

### **International Trade in Endangered Species Act 2008 (Act 686)**

This Act (also known as CITES Act) has been enforced since December 2009 to implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Department of Fisheries Malaysia (DOF), Department of Fisheries Sabah (DOFS) and Sarawak Forestry Department have been appointed as Management Authorities for fish to adopt implementation and legislation under this act which trade matters i.e. import, export and re-export; and introduction from the sea, possession, transit, breeding or propagation of hundreds of species, including their parts and derivatives, are controlled.

### **Sabah Aquaculture and Inland Fisheries Enactment 2003**

The Enactment is to provide for the sustainable development and management of inland fisheries and aquaculture in the State of Sabah. Rules and regulations imposed under the specified section of this Enactment, among others are aimed at conserving any threatened, protected, controlled and rare freshwater fishes, such as Ganges River Shark (*Glyphis gangeticus*) and Giant Freshwater Whipray (*Urogymnus polylepis*).

Fisheries Plans and Aquaculture Development Plans, Riverine Fishing and Fisheries, Control of Fish, Fish Habitat Protection, Fish Sanctuary and Enforcement are the provisions in the Enactment that related most to the management and conservation of freshwater elasmobranch in the state.



# CHAPTER 3





## REVIEW AND RECOMMENDATIONS OF PLAN 2

**PLAN 2** outlined various strategies in order to realize its objectives. The action plans formulated for the period of 2014 till 2023 were divided into seven categories, as follows.

- Improvement of Data Collection;
- Rectifying Negative Perception on Terminology;
- Intensifying Capacity Building;
- Strengthening Conservation and Management;
- Strengthening Law and Enforcement;
- Comprehensive and Coordinated Research, and;
- Securing Funding.

The review of Plan 2 showed that some of the action plans were successfully implemented and had achieved their goals. Some are either not fully implemented or have yet to be implemented. It has also been identified that all action plans are still relevant and should be included in Plan 3. As such, there is an urgent need for Plan 3 to be developed and implemented. The summary of the evaluation and review of Plan 2 is shown in Table 1.

## EVALUATION AND REVIEW OF PLAN 2 (2014-2023)

1	EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
<b>IMPROVEMENT OF DATA COLLECTION</b>				
1.1	Misreporting of shark and ray species due to insufficient training	<p><b>KPI: One book entitled 'Field Guide on Ray Species in the South East Asian Region'</b></p> <ul style="list-style-type: none"> <li>i. Field guide to Rays, Skates and Chimaeras of the Southeast Asian Region published in 2014.</li> <li>ii. Identification Guide to Sharks, Rays and Skates of the Southeast Asian Region (Volume 1) published in 2017.</li> <li>iii. A baseline information for elasmobranch resource assessment in the Tun Mustapha Park, Northern Borneo published in 2018.</li> <li>iv. Identification Guide to Sharks, Rays, Skates, and Chimaeras of the Southeast Asian Region (Volume 2) published in 2020.</li> </ul>	Yes	Guide book Volume 1 only listed 56 species of sharks and 62 species of batoids. Volume 2 published at Action Taken Volume 2 with another 50 species of sharks and 50 species of batoids
		<p><b>KPI: One training per year on taxonomy and biology of sharks and rays for 16 trainees.</b></p> <ul style="list-style-type: none"> <li>i. ISMAT organised two training on identification of sharks and rays in 2014, one training in 2015 and 2016. In 2017 and 2018 ISMAT organised taxonomy training for bony fishes and elasmobranchs.</li> <li>ii. SEAFDEC/MFRDMD organised regional training on identification of sharks and rays in 2014, 2017, 2019, 2022 and 2023.</li> </ul>	Yes	On-going activity and to be continued.

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
1.2	<p>Deficiency in data collection on biology, socio-economics and trade</p> <p><b>KPI: One report on biology, socio-economic and trade of sharks and rays</b></p> <p>ISMAT in collaboration with Institute of Agricultural and Food Policy Studies (IKDPM) UPM have conducted studies on marketing, trade, and socio-economic in Sabah. Two reports published in 2017 and 2018.</p> <ul style="list-style-type: none"> <li>i. Marketing of sharks and rays in Sabah and International trade of Malaysia's sharks and rays published in 2017.</li> <li>ii. Studies on marketing, trade and socio-economic of traders and fishers were conducted at Semporna, Sandakan, Tawau and Kota Kinabalu in Sabah. The reports were published in 2017.</li> <li>iii. A study on fishers dependency on sharks and rays in Sabah, Malaysia published in 2018.</li> <li>iv. Market surveys of elasmobranch fisheries resources in the Tun Mustapha Park, Sabah, Malaysia.</li> <li>v. Domestic Marketing of Sharks and Rays in Perak and Pahang, Malaysia in 2019.</li> <li>vi. A Study of Domestic Marketing Channel on Sharks and Rays in Selected Districts of Sarawak, Malaysia also published in 2020.</li> </ul>	Yes	The study on marketing and socio-economic should be extended to Peninsular Malaysia and Sarawak

	EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
		<p>vii. Factors Influencing the Effectiveness of Supply Chain Traceability System Implementation for Shark and Ray Products in Pahang, Malaysia: Insights from Key Informant Interviews. International Journal of Business and Society in 2022</p> <p>viii. Barriers to Participating in the Collection of Traceable Catch Landing Data for Sharks and Rays: Focus Group Discussions (FGD) of Small-Scale Fishers in Pahang, Malaysia in 2022</p>		
1.3	Difficulties in recording all shark and ray species (63 species of sharks and 69 species of rays)	<p><b>KPI: Pilot project to record landings of 10 major shark and ray species at five selected landing sites</b></p> <p>Data collection up to species level was collected continuously since 2013 at Semporna, Sandakan, Tawau (in Sabah), Hutan Melintang, Pantai Remis and Manjung (in Perak). The study is ongoing in Kota Kinabalu and Tawau (in Sabah) while in Perak (Bagan Panchor), the data collection was stopped in 2020.</p> <p>DOF and DOFS recorded 18 species of rays and 16 species of sharks in fisheries statistic system since 2015. The number of species will be added in stages and data are available upon request.</p>	Yes	Data collection activity should be carried out continuously

2	EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
2.1	Misreporting of shark and ray species due to insufficient training	<p><b>KPI : Intensify public awareness programmes</b>  <b>One public seminar or workshop or forum per year</b></p> <ul style="list-style-type: none"> <li>i. DOFS organised seven awareness programmes since 2014.</li> <li>ii. Series of awareness programmes were conducted by DOF at state level in 2014.</li> <li>iii. ISMAT in collaboration with Sekolah Menengah Kebangsaan Chendering organised conservation programme on sharks and rays during School Science Day.</li> </ul> <p><b>Four exhibitions per year</b></p> <ul style="list-style-type: none"> <li>i. Permanent exhibition at MAHA/HPPNK Serdang, Selangor since 2016.</li> <li>ii. 'Kingdom of Sharks Gallery' at MAEPS is open to public during first Saturday of each month.</li> </ul> <p><b>Two posters on the need to conserve sharks and rays</b></p> <p>ISMAT published poster in three languages (Malay, Tamil and Mandarin) and distributed to fishers, fisheries association and traders.</p>	Yes	Public awareness campaign should be extended to fishers communities at sharks and rays landing sites
			Yes	On-going activity and to be continued

	EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
		<p><b>One article in mainstream newspapers per year</b></p> <p>Articles on sharks and rays were published in Utusan Malaysia and Berita Harian in 2014</p> <p><b>Publicity through electronic media (TV, etc.)</b></p> <p>Coverage on 'Say No to Shark Fin' Campaign was aired on mainstream television channels in 2017.</p> <p>Other related event include:</p> <ul style="list-style-type: none"> <li>i. Malaysian government bans the serving of shark fin soup at all official events since May 2014.</li> <li>ii. Series of campaign on 'Say No to Shark Fin' were organised in Perak, Pahang, Kuala Lumpur, Sabah and Sarawak since 2014.</li> <li>iii. WWF Malaysia organised 'My Fin My Life' in Sabah and Pulau Pinang in 2016 and 'wedding without fins' campaigns in 2018.</li> </ul>		
<b>3</b>	<b>INTENSIFYING CAPACITY BUILDING</b>			
<b>3.1</b>	Insufficient knowledge on biology, taxonomy, ecology and resource assessment	<p><b>KPI</b></p> <ul style="list-style-type: none"> <li>i. <b>Conduct more training courses and workshops on biology, taxonomy, ecology and stock assessment of sharks and rays</b></li> </ul>	<b>Yes</b>	On-going activity and to be continued.

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
	<ol style="list-style-type: none"> <li>1) ISMAT organised two training on identification of sharks and rays in 2014, one training in 2015 and 2016. In 2017 and 2018 ISMAT organised taxonomy training for bony fishes and elasmobranchs.</li> <li>2) SEAFDEC/MFRDMD organised regional training on identification of sharks and rays in 2014, 2017 and 2022.</li> <li>3) SEAFDEC/MFRDMD in collaboration with SEAFDEC/TD organised 'Training Workshop on Sharks and Rays Stock Assessment by using YPR Model in 2018.</li> <li>4) SEAFDEC/MFRDMD conducted population study on <i>Chiloscyllium punctatum</i> at Kota Kinabalu, Bagan Panchor and Johor/Pahang in 2017.</li> <li>5) DOF published a book on identification guide on rays entitled 'Panduan Mengenal Spesies Ikan Pari' in 2017. The book was distributed to fishers and DOF officers.</li> <li>6) Kursus Pengenalan Spesies Terancam Baharu di bawah Akta CITES (Akta 686) Yu, Pari Manta, Pari Mobula dan Nautilus Siri 1/2019 (23-26 September 2019) in ISMAT</li> <li>7) Kursus Pengenalan Spesies Terancam Baharu di bawah Akta CITES (Akta 686) Yu, Pari Manta, Pari Mobula dan Nautilus Siri 1/2019 (4-7 November 2019) in ISMAT</li> <li>8) Bengkel Pengutipan Data Pendaratan Yu dan Pari Bil. 1/2020 (24 - 27 Ogos 2020) in ISMAT.</li> </ol>		

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
	<p>9) Workshop on Conservation of Sharks and Rays Through Parasites' Perspective (1-2 Disember 2021) in ISMAT.</p> <p>10) Workshop on Landing Data Analysis of Sharks and Rays by Species to Determine Value of Maximum Sustainable Yield (MSY) (6-7 Disember 2021) in Hotel Tanjung Vista, Terengganu.</p> <p>11) Workshop on Taxonomy, Creel and Genetic of Sharks and Rays for Researchers of the Shark Population Study (14-17 Mac 2022) di ISMAT</p> <p>12) SEAFDEC/MFRDMD organised 'Regional Training and Workshop on Chondrichthyan Taxonomy, Biology and Data Collection' on 2-6 October 2022 in Terengganu.</p> <p>13) SEAFDEC/MFRDMD organised 'On-Site Training on Chondrichthyns Taxonomy, Biology and Data Collection' on 14-17 February 2023 at Sihanoukville, Cambodia.</p> <p>14) SEAFDEC/MFRDMD organised 'Regional On-site Training on Chondrichthyns Taxonomy, Biology and Data Collection' on 3-6 October 2023 at Sabah, Malaysia.</p> <p>15) Program Peningkatan Kapasiti Penguatkuasaan Bersama Agensi Luar on 19-21 September 2023 in Pahang</p> <p>16) SEAFDEC/MFRDMD in collaboration with SEAFDEC/TD organised 'Regional Training on Sharks and Rays Stock Assessment by Yield Per Recruit (YPR) Model' on 4-7 December 2023 in Selangor.</p>		

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
	<p>ii. <b>Conduct more stakeholder consultations with those involved in research, management and education</b> <b>(One seminar or meeting per year)</b></p> <ol style="list-style-type: none"> <li>1) Consultation with government agencies and NGOs was conducted in Sabah in 2018 and 2022 to discuss on conservation and management of sharks and rays in Malaysia.</li> <li>2) DOF organised series of stakeholders (NGOs, tourism agencies, fisheries associations, etc) consultation on the proposal to list several sharks and rays species in Fisheries Act 1985 in Sabah, Perak, Pahang, Sarawak between 2016-2022.</li> </ol> <p>iii. <b>Conduct resource surveys in deep-sea areas</b> <b>(One survey every five years)</b></p> <p>National Resources Survey 2013-2016</p> <p>iv. <b>Participate in seminars and meetings related to the issues at national, regional and international levels</b> <b>(One seminar/ meeting per year)</b></p>		

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
	<ol style="list-style-type: none"> <li>1. DOF and DOFS officers attended series of CITES meeting and seminar related to sharks issues in Thailand, Indonesia, Philippines, Switzerland, Maldives and Panama since 2014.</li> <li>2. DOF participated in Workshop on Introduction to Sharks and Rays, Their Identification and Conservation by Wildlife Conservation and Science (Malaysia) Bhd. in Kuching, Sarawak (2022).</li> </ol>		
<b>4 STRENGTHENING CONSERVATION AND MANAGEMENT</b>			
<b>4.1</b> Conflict of interest between ecotourism and fisheries	<ol style="list-style-type: none"> <li>i. <b>Conduct feasibility study on areas of conflict</b> MRF Project: Deployment of Electronic Monitoring Cameras on Fishing Trawlers in Sabah</li> <li>ii. <b>Engage stakeholders in conservation and management through Ecosystem Approach Fisheries Management (EAFM)</b>  DOFS organized a series of EAFM consultation on shark since 2017, funded by the German government through the non-governmental organization Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). The consultation sessions involved stakeholders from fishers, traders, local authorities, universities, private and government agencies.</li> </ol>	<b>Yes</b>	The study on marketing and socio-economic should be extended to selected sites in Peninsular Malaysia and Sarawak (Tg. Manis, Miri).

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
	<p>1. 7th August 2017 - 1<sup>st</sup> consultation for Shark conservation and awareness in Sandakan, Sabah</p> <p>2. 14th September 2017 – 2<sup>nd</sup> consultation for Shark conservation and awareness in Sandakan, Sabah</p> <p>3. 23rd May 2018 – 3<sup>rd</sup> consultation for Shark conservation and awareness in Semporna, Sabah</p> <p><b>iii. Support the ongoing programmes on alternative livelihood from capture fisheries to other activities.</b></p> <p>Fishers are encouraged to venture in aquaculture activities such as fish farming, seaweed culture, eco-tourism, etc. to reduce the exploitation of wild capture. DOF and DOFS continue to provide training and subsidies.</p> <p><b>iv. Promoting ‘catch &amp; release’ activity during fishing tournament/contest/competition</b></p> <p>Based on observations, number of sharks caught is very minimum and are not listed as endangered species, therefore ‘catch &amp; release’ is only applied for marlin and sailfish.</p> <p>Recreational fisheries briefing in conjunction with ‘Rapala dan Storm’ Jigging competition in Miri, Sarawak on 18 September 2022.</p>		

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
	<p>During fishing competition organised by 'Persatuan Memancing Sarawak' in deep water fishing tournament in Mukah, Sarawak on June, 2022 and Sematan Fishing Competition organised by Ministry of Youth and Sports Sarawak on June 2023, a briefing on endangered species including sharks was conducted.</p> <p><b>v. Engage with the tourism industry and relevant stakeholders through education and awareness programmes</b></p> <p>Sabah government organized consultations at least once a year in Tun Mustapha Park (TMP) since its gazetterment in 2016. The engagement with all level of stakeholders focused on sustainable livelihood, ecotourism and conservation of endangered aquatic species among others.</p> <p><b>vi. Catch &amp; release will be enforced once the related regulation is put in place.</b></p> <p>Continuous awareness programme between recreational fishing stakeholders.</p>		

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
<p><b>4.2</b></p> <p>Limited cooperation in conservation and management of shared, straddling and highly migratory sharks and rays at regional level</p>	<p><b>Promote more data and information sharing in conservation and management measures of sharks and rays at regional level.</b></p> <p>DOF in collaboration with SEAFDEC conducted study on sharks and rays landing data at species level in Malaysia, Thailand, Indonesia, Myanmar, Cambodia and Vietnam since 2015.</p> <p><b>Participate in one regional seminar or workshop</b></p> <p>DOF and DOFS officers attended regional annual seminar on sharks and rays organised by SEAFDEC since 2014.</p>		
<p><b>4.3</b></p> <p>Insufficient rehabilitation, conservation and resource enhancement activities on sharks and rays</p>	<p><b>Conduct more programmes on rehabilitation and enhancement of shark and ray resources through deployment of artificial reefs.</b></p> <p>DOF and DOFS deployed more than one thousand units of artificial reefs throughout Malaysian coastal waters since 2014.</p> <p>Study on Biomass, Value and Biodiversity of Fishes by Underwater Videography at Selected Artificial Reefs in Peninsular Malaysia in 2019.</p>		

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
<p><b>4.4</b></p> <p>Bycatch of juvenile sharks and rays by moonsoon trawlers in coastal waters</p>	<p><b>Conduct awareness programmes among operators of trawlers and other relevant stakeholders</b></p> <ul style="list-style-type: none"> <li>i. One awareness program was organised at Kuala Pahang in 2018 involving 35 trawlers.</li> <li>ii. Ongoing awareness programme was organised by ISMAT at Nenasi, Pahang since 2022 until early 2024 involving 20 trawlers.</li> </ul> <p><b>One poster on conservation of sharks and rays</b></p> <p>ISMAT published poster in three languages (Malay, Tamil and Mandarin)</p>		
<b>5 STRENGTHENING LAW AND ENFORCEMENT</b>			
<p><b>5.1</b></p> <p>Freshwater sharks and rays is under State jurisdiction</p>	<p><b>Propose to State government to establish and include the management of freshwater sharks and rays in their State fisheries rules and regulations</b></p> <p>The management of freshwater sharks and rays in Sabah is under the Sabah Aquaculture and Inland Fisheries Enactment 2003.</p> <p>Preliminary study on inventory species of rays in Perak, Kelantan, Pahang and Johor on the proposal by adding as potential listed species in Inland Fisheries Enactment</p>	<b>Yes</b>	<p>On-going activity and to be continued.</p>

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
<p><b>5.2</b> Incidental catch of protected species and endangered species</p>	<p><b>Intensify awareness programmes on laws and regulations</b>  <b>(Four exhibitions per year)</b></p> <p>Two posters on protected and endangered species Pamphlets, stickers, booklets, etc. on protected and endangered sharks and rays (e.g. whale shark and sawfish)</p> <p>MAHA 2016  Gelombang Nelayan Nasional 2017  MAHA 2018  MAHA 2022</p> <p><b>(One article in mainstream newspapers per year)</b></p> <p>Since 2014 only a few cases of incidental catch of whale sharks was reported. Series of public awareness campaign were organised in collaboration between DOF, DOFS and NGOs.</p>	<p><b>Yes</b></p>	<p>On-going activity and to be continued.</p> <p>2 articles in mainstream newspaper/facebook/ Instagram/ official web/ tik tok per year.</p>

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
<p><b>5.3</b></p> <p>Insufficient expertise to identify sharks and rays and their derivatives listed under CITES and Fisheries (Control of Endangered Species of Fish) Regulations 1999</p>	<p><b>i. Conduct projects on DNA bar-coding on shark and ray species</b></p> <p>SEAFDEC/MFRDMD had analysed 122 and 120 specimens for sharks and rays respectively. Out of this, 39 species of sharks, 32 species of rays and 2 species of skates were managed to get DNA sequences results and has been uploaded to BOLD database system (<a href="http://boldsystems.org">http://boldsystems.org</a>). Among them are the four species of sharks (<i>Rhincodon typus</i>, <i>Sphyrna lewini</i>, <i>S. mokarran</i>, <i>S. zygaena</i>) currently listed in Appendix II CITES.</p>	<p><b>Yes</b></p>	<p>On-going activity and to be continued.</p>
<p><b>5.4</b></p> <p>Absence of finning regulations under the current legal framework</p>	<p><b>Amend existing regulation or impose conditions on fishing licence</b></p> <p>Finning is prohibited according to Section 8(b) Fisheries Act 1985. Measure enforced in 2014.</p>	<p><b>No</b></p>	

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
6	<b>COMPREHENSIVE AND COORDINATED RESEARCH</b>		
6.1	<p>Insufficient comprehensive research on various aspects (biology, friendly gear, resource enhancement, taxonomy, etc.)</p>	<p><b>Yes</b></p> <p><b>KPI: Conduct comprehensive and coordinated research</b></p> <p><b>One collaborative study every five years.</b></p> <p>SEAFDEC/MFRDMD conducted collaborative research with Cambodia, Vietnam, Myanmar and Thailand on DNA Barcoding and data collection since 2015. Marketing study was conducted in collaboration with Indonesia in 2018.</p> <p>DOF in collaboration with DOFS and UPM conducted marketing and socio-economic study in Sabah.</p> <p>“Mobilization of State Stakeholders to Investigate Reports of Diseased Sharks in Sipadan Island Park”</p> <ul style="list-style-type: none"> <li>• Output: “Sharks in peril: importance of top predators and healthy ecosystems for blue recovery of Sipadan Island, Sabah, Malaysia”</li> <li>• Collaboration research between UMS and Sabah Parks</li> </ul>	<p>Marketing study should be extended in other neighbouring countries such as Singapore, Thailand, Brunei Darussalam and Philippines</p>

EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
6.2	<p>Limited resources (facilities, funding)</p>	<p><b>Yes</b></p>	<p>On-going activity to be continued.</p>
	<p><b>KPI: Request budget for research facilities and implementation Upgraded DNA laboratory at SEAFDEC/MFRDMD and taxonomy laboratory at FRI Bintawa, FRI Kg Acheh.</b></p> <ul style="list-style-type: none"> <li>i. DNA laboratory and fish repository at SEAFDEC/MFRDMD was upgraded with new equipment and new facilities.</li> <li>ii. Upgrade repository centre in Fisheries Complex Likas, Sabah</li> <li>iii. Upgrade facilities in FRI Bintawa and FRI Kg Acheh for sharks and rays.</li> </ul>		

	EVALUATION AND REVIEW	ACTION TAKEN	RELEVANT TO PLAN 3 (YES / NO)	RECOMMENDATION
7	<b>SECURING FUNDING</b>			
7.1	Insufficient sustainable and specific funding to monitor and implement NPOA Shark	<p><b>KPI</b>  <b>Use NPOA Shark to justify funding application (RMK-10, RMK-11 &amp; RMK-12)</b>  <b>(Two proposals per year from national funds)</b></p> <p>Funding is available every year from DOF, however insufficient budget for sharks and rays project/programmes.</p>		
7.2	Stringent mechanism to receive funding from international donors.	<p><b>KPI</b>  <b>Simplify the mechanism for channelling of funds.</b>  <b>(Two consultations with relevant agencies (EPU, AGC, MOF))</b></p> <p>Funding from EU-CITES was directly channel to SEAFDEC/TD in collaboration with SEAFDEC/MFRDMD to assist in data collection and species identification of sharks and rays (2016-2018)</p>		



## PLAN 3

**THE** main goal of this action plan is to conserve, rehabilitate and sustain sharks and rays resources in Malaysia. The successful outcome of this plan will be the sustainable exploitation of sharks and rays and the enhancement of the populations of those species that are endangered or threatened. Future generations of Malaysians will continue to benefit from the economic, recreational and educational objectives.

As in the previous Plan 2, the main strategy of Plan 3 is to focus on issues and take direct the most effective actions through programmes or projects for solving the issues. In essence the plan is action oriented.

Six action plans have been proposed, with relevant programmes and projects to be implemented for each issue to ensure the successful outcome of the plan. The main action plans, issues and programmes/projects are listed in Table 2. The six main action plans are summarized below.

### **1. Research and Monitoring**

Continuous and intensified research will enhance the knowledge on the biology, taxonomy, ecology and fishing of sharks and rays. Coordinated research and sharing of research data information among various stakeholders such as government agencies, academic institutions and NGOs are essential in guiding the formulation of an effective and efficient management plan. As most sharks are migratory in nature, research engagement at regional and international level need to be continued and strengthened. At the same time, critical factors such as expertise, research facilities and adequate funding need to be available.

### **2. Education and Public Awareness**

Education and public awareness are a vital component and the most popular ways to raise public interest and educate people about a specific issue. Programme on conservation and management of sharks and rays targeting all level of stakeholders will enhance the awareness and support for initiatives such as combating Illegal, Unreported and Unregulated Fishing (IUU) and reduction of incidental catch, including of juvenile sharks.

### **3. Intensifying Capacity Building**

Capacity building is essential in obtaining and improving knowledge and skills in the management and conservation of sharks and rays. This could be achieved through training courses and participation in conferences, seminars and workshops locally and abroad. Training on the identification of sharks and rays, and their derivatives for example, will enhance the capability of enforcement personnels in identifying species that listed under CITES and Fisheries Act 1985 (Control of Endangered Species of Fish) Regulations 1999.

## **4. Strengthening Conservation and Management**

As most species of sharks and rays are migratory, they migrate or straddle between marine protected areas (where ecotourism activities occur) and fishing grounds resulting in conflicts of interest between stakeholder groups e.g. between ecotourism groups and fishers. Thus, there is a need to manage sharks and rays on a collaborative basis among all level of stakeholders. The Ecosystem Approach to Fisheries Management (EAFM) in managing sharks and rays resources and the deployment of artificial reefs to rehabilitate and provide breeding and nursery ground for the species need to be continued.

At regional and international level, the objectives of conservation and management of sharks and rays and their long-term sustainable use should also be pursued under frameworks such as SEAFDEC, CTI, BOBLME and ASEAN-WEN.

## **5. Strengthening Law and Enforcement**

The enforcement and adequacy of laws and regulations is an important issue in the management of sharks and rays. For example, freshwater sharks and rays that inhabit rivers are under State jurisdiction. This action plan proposes that the State fisheries law incorporates the management of freshwater sharks and rays.

IUU Fishing activity in Malaysian waters such as the encroachment of foreign fishing vessels targeting endangered marine species including live sharks become increasingly alarming. Therefore, measures to combat this illegal activity in the country need to be intensified.

## **6. Securing Funding**

Adequate and sustainable funding from both national and international sources are needed to ensure the success implementation of Plan 3. At the same time, there is a need for an efficient mechanism to facilitate faster transfer of research funds especially from international donors.

Presently, there is limited resources to upgrade and maintain the research institutions facilities in the country, as well as the challenge to continue with the current sharks and rays landing data collection program due to the high costs involved.

**Table 2: Plan 3 (2024 – 2030)**

1. RESEARCH AND MONITORING				
Action Plan				
ISSUES	ACTION	TIMELINE	KEY PERFORMANCE INDICATOR (KPI)	IMPLEMENTING AGENCIES
i. Lack of data due to limited research on socio-economics, marketing and trade  ii. Juvenile and gravid shark as Bycatch especially in trawl net	Strengthening efforts to collect data on socio-economics, marketing and trade .	2025-2027	One report on marketing and trade of shark and ray products	DOF, NRES, LKIM, MAQIS, Customs, State Government
	a. A study to record the number of incidents of gravid sharks and number of newborns/ juveniles  b. Identify critical habitats particular to vulnerable or threatened shark and ray species stocks with the aim to provide spatial protection or other management options .  c. eDNA study for ETP species  d. Research on abundance of hammerhead shark	2024-2030	a. One pilot research  b. One critical habitats that suitable for closed season (refer to 4.2, Plan 2)  c. One pilot study on eDNA study for ETP species  d. One pilot research One research paper on traceability and marketing of shark and ray products	DOF, DOFS, Universities and NGOs

1. RESEARCH AND MONITORING				
Action Plan				
ISSUES	ACTION	TIMELINE	KEY PERFORMANCE INDICATOR (KPI)	IMPLEMENTING AGENCIES
iii. Partial traceability of resources on shark and ray products throughout supply chain	Cooperation among stakeholders to identify the relevant authorities involved in supply chain of shark and ray products.	2025-2027	One research paper on traceability and marketing of shark and ray products	DOF, DOFS, LKIM, MAQIS, Customs, Universities and other relevant agencies
iv. Limited information on sharks and rays at species level at major fish landing sites	Conduct data collection study by species in selected landing sites	2024-2030	One report on shark and ray inventory at major fish landing sites	DOF, DOFS and NGOs
v. Limited information on freshwater rays	Conduct surveys to identify the status of freshwater rays in Peninsular Malaysia (Perak, Pahang, Johor and Kelantan), Sarawak and Sabah	2024-2030	One report on freshwater rays status in Peninsular Malaysia, Sarawak and Sabah	DOF, DOFS, DOA Sarawak, State Government and Universities

2. EDUCATION AND PUBLIC AWARENESS				
Action Plan				
ISSUES	ACTION	TIMELINE	KEY PERFORMANCE INDICATOR (KPI)	IMPLEMENTING AGENCIES
i. The need in strengthening public awareness among targeted group	To educate and conducting public awareness programmes on conservation and management of sharks and rays targeting fishing communities and local communities, diver, tourists and other public communities	2024-2030	3 programmes per year	DOF, DOFS, Universities, NGOs and other agencies
ii. By catch of juvenile sharks by monsoon trawlers in coastal waters	Conduct awareness programmes among operators of trawlers and other relevant stakeholders in east coast of peninsular Malaysia	2024-2030	2 programmes per year	DOF, LKIM, NGOs
iii. Incidental catch of endangered, threatened and protected (ETP) species	a. To intensify awareness programmes on protected and endangered species e.g. whale shark, and sawfishes	2024-2030	a. Three programmes per year	DOF, DOFS, State Government, NGOs, Anglers
	b. To establish platform medium for reporting of incidental catches of ETP species		b. One networking platform between Government and stakeholders is established	

3. INTENSIFYING CAPACITY BUILDING					
Action Plan	ISSUES	ACTION	TIMELINE	KEY PERFORMANCE INDICATOR (KPI)	IMPLEMENTING AGENCIES
i.	Updating species name and discovery of new species/new records of sharks and rays	i. DOF will prepare an update version of field guide on ray species through workshop/meeting	2025-2030	One guide book/digital guide book to be published	DOF
		ii. Organise training courses and workshops on shark and ray identification, biology and taxonomy	2024-2030	One training per year on taxonomy and biology of sharks and rays for government trainees	DOF, DOFS, NGOs
		i. Conduct schedule and unschedule training courses and workshops on conservation and management of sharks and rays including CITES and IUCN Red List species	2024-2030	One training per year	DOF, DOFS, NRES State Government, and other relevant enforcement agencies
ii.	The need for knowledge enhancement among government officials	ii. Participate in related programmes at state, national, regional, or international levels	2024-2030	One programme per year	DOF, DOFS, State Government
		iii. Insufficient expertise to identify sharks and rays and their derivatives listed under CITES and Fisheries (Control of Endangered Species of Fish) Regulations 1999 and IUCN Red List	2024-2030	One training per year	DOF, DOFS, Customs, MAQIS, MMEA, and other relevant enforcement agencies

4. STRENGTHENING CONSERVATION AND MANAGEMENT					
Action Plan	ISSUES	ACTION	TIMELINE	KEY PERFORMANCE INDICATOR (KPI)	IMPLEMENTING AGENCIES
	i. Conflict of interest between ecotourism, conservationist and fisheries	<ul style="list-style-type: none"> <li>i. Conduct socio-economic studies on areas of interaction to compile information from both ecotourism and locals for resource management</li> <li>ii. Conduct stakeholder consultations to minimise misunderstanding among industry key players</li> </ul>	2027-2030	One project on socio-economic study	DOF, DOFS, State Governments, Universities and NGOs
	ii. By catch of juvenile sharks	<ul style="list-style-type: none"> <li>i. Deployment of artificial reefs at selected areas to prevent trawling and enhance the resource</li> <li>ii. Identify sharks and rays nursery ground</li> </ul>	2024-2030	Three programmes  5 sites  2 sites	DOF, DOFS, State Government, Universities and NGOs  DOF, DOFS, State Governments
5. STRENGTHENING LAW AND ENFORCEMENT					
	i. Encroachment by foreign fishing vessels which targetting sharks	Strengthening enforcement capacity including inter-agency enforcement activity	2024-2030	Two programmes per year	DOF, DOFS, MMEA, and other enforcement agencies
	ii. Emerging aquarium trade for juvenile sharks	Conduct a study to regulate collection of juvenile shark for ornamental trade	2024-2030	One study	DOF, DOFS

6. SECURING FUNDING					
Action Plan	ISSUES	ACTION	TIMELINE	KEY PERFORMANCE INDICATOR (KPI)	IMPLEMENTING AGENCIES
	i. No long-term research funds for shark study	Use NPOA Shark to justify funding application (RMK-13, CTI)	2024-2030	Four proposals during implementation of NPOA Shark Plan 3	DOF, DOFS, MAFS, NRES, CTI
	ii. Stringent mechanism to receive funding from donors	To expand the scope in receiving funding from relevant partners	2024-2030	One proposal	DOF, DOFS, NRES, SEAFDEC/MFRDMD, Universities
	iii. Limited resources to upgrade and maintenance research institutions facilities	Request budget for research facilities upgrading and implementation	2024-2030	One proposal	DOF
	iv. Data collection for NDFs required huge expenses and it is a mandatory requirement for a CITES Appendix II listed species to be exported	Securing funding from the project proponent and other relevant donors	2024-2030	One proposal upon request	DOF, DOFS

# CHAPTER 4





## MONITORING AND EVALUATION

Over the time frame of Plan 2, regular monitoring of its implementation was insufficient. This made it difficult to assess its performance. In the light of this, it is proposed that over the time frame of Plan 3, regular monitoring will be conducted by a Technical Committee. This Technical Committee will report the progress of implementation of the Plan to the National Steering Committee.

A full review is expected to be conducted at the end of 2027 and 2030 respectively by the Technical Committee and submitted to the National Steering Committee for guidance.

**Table 3:** Implementation Schedule

NO	ACTIONS	YEAR						
		2024	2025	2026	2027	2028	2029	2030
1	Research and monitoring							
2	Education and public awareness							
3	Intensifying capacity building							
4	Strengthening conservation and management							
5	Strengthening law and enforcement							
6	Securing Funding							



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# APPENDIX 1:

## Checklist of Sharks and Rays in Malaysia and Their Habitats

### List of habitats

- SHS = shelf to slope  
 SOC = slope to oceanic  
 SHO = shelf to oceanic  
 SSO = shelf to semi-oceanic  
 WRH = wide range of habitats  
 SHF = euryhaline/freshwater/shelves  
 OCE = confined in oceanic  
 SHL = continental/insular shelves  
 SLO = continental/insular slopes  
 FWO = obligate freshwater

No	ORDER / Family / Scientific Name	Common Name (English)	Habitat
<b>SHARKS</b>			
<b>ORDER HEXANCHIFORMES</b>		<b>COW AND FRILLED SHARKS</b>	
Family Hexanchidae		Sixgill and Sevengill Sharks	
1	<i>Heptranchias perlo</i> (Bonnaterre, 1788)	Sharpnose Sevengill Shark	SHS
2	<i>Hexanchus griseus</i> (Bonnaterre, 1788)	Bluntnose Sixgill Shark	SHS
<b>ORDER HETERODONTIFORMES</b>		<b>HORNSHARKS</b>	
Family Heterodontidae		Hornsharks	
1	<i>Heterodontus zebra</i> (Gray, 1831)	Zebra Bullhead Shark	SHL
Family Rhincodontidae		Whale Shark	
2	<i>Rhincodon typus</i> Smith, 1828	Whale Shark	SHO
Family Orectolobidae		Webbeggongs	
3	<i>Orectolobus leptolineatus</i> Last, Pogonoski & White, 2010	Indonesian Wobbegong	SHL
Family Hemiscylliidae		Longtailed Carpetsharks	
4	<i>Chiloscyllium griseum</i> Müller & Henle, 1838	Grey Bambooshark	SHL
5	<i>Chiloscyllium hasseltii</i> Bleeker, 1852	Hasselt's Bambooshark	SHL
6	<i>Chiloscyllium indicum</i> (Gmelin, 1789)	Slender Bambooshark	SHL
7	<i>Chiloscyllium plagiosum</i> (Anonymous [Bennett], 1830)	Whitespotted Bambooshark	SHL
8	<i>Chiloscyllium punctatum</i> Müller & Henle, 1838	Brownbanded Bambooshark	SHL

	<b>Family Stegostomatidae</b>	<b>Zebra Shark</b>	
9	<i>Stegostoma tigrinum</i> (Forster, 1783)	Zebra Shark	SHL
	<b>ORDER: ORECTOLOBIFORMES</b>	<b>CARPET SHARKS</b>	
	<b>Family Ginglymostomatidae</b>	<b>Nurse Sharks</b>	
10	<i>Nebrius ferrugineus</i> (Lesson, 1831)	Tawny Nurse Shark	SHL
	<b>ORDER: LAMNIFORMES</b>	<b>MACKEREL SHARKS</b>	
	<b>Family Alopiidae</b>	<b>Thresher Sharks</b>	
11	<i>Alopias pelagicus</i> Nakamura, 1935	Pelagic Thresher	SHO
12	<i>Alopias superciliosus</i> Lowe, 1841	Bigeye Thresher	SHO
	<b>Family Lamnidae</b>	<b>Mackerel Sharks</b>	
13	<i>Carcharodon carcharias</i> (Linnaeus, 1758)	Great White Shark	SHO
14	<i>Isurus oxyrinchus</i> Rafinesque, 1810	Shortfin Mako	SLO
	<b>Family Scyliorhinidae</b>	<b>Cat Sharks</b>	
15	<i>Atelomycterus marmoratus</i> (Anonymous [Bennett], 1830)	Coral Catshark	SHL
16	<i>Cephaloscyllium sarawakense</i> Yano, Ahmed & Gambang, 2005	Sarawak Pygmy Swell Shark	SHS
17	<i>Cephaloscyllium cf. speccum</i>	Speckled Swell Shark	SHS
	<b>Family Pentanchidae</b>	<b>Deepwater Catsharks</b>	
18	<i>Apristurus platyrhynchus</i> (Tanaka, 1909)	Flatnose Catshark	SLO
19	<i>Halaelurus buergeri</i> (Müller & Henle, 1838)	Blackspotted Catshark	SLO
20	<i>Halaelurus maculosus</i> White, Last & Stevens, 2007	Indonesian Speckled Catshark	SHL
	<b>Family Proscylliidae</b>	<b>Finback Catsharks</b>	
21	<i>Eridacnis radcliffei</i> Smith, 1913	Pygmy Ribbontail Catshark	SHS
	<b>Family Triakidae</b>	<b>Hound Sharks</b>	
22	<i>Mustelus mosis</i> Hemprich & Ehrenberg, 1899	Arabian Smoothhound	SHS
23	<i>Mustelus lenticulatus</i> Phillipps, 1932 Smoothhound	Spotted Estuary	SHL
24	<i>Mustelus sp.</i> [Yano, <i>et al.</i> , 2005]	Sarawak Smoothhound	SHL
25	<i>Mustelus widodoi</i> White & Last, 2006	Whitefin Smoothhound	SHL
	<b>Family Hemigaleidae</b>	<b>Weasel Sharks</b>	
26	<i>Chaenogaleus macrostoma</i> (Bleeker, 1852)	Hooktooth Shark	SHL
27	<i>Hemigaleus microstoma</i> Bleeker, 1852	Sicklefin Weasel Shark	SHL
28	<i>Hemipristis elongata</i> (Klunzinger, 1871)	Snaggletooth Shark	SHL

	ORDER: CARCHARHINIFORMES	GROUND SHARKS	
	Family Carcharhinidae	Requiem Sharks	
29	<i>Carcharhinus albimarginatus</i> (Rüppell, 1837)	Silvertip Shark	SSO
30	<i>Carcharhinus amblyrhynchoides</i> (Whitley, 1934)	Graceful Shark	SHL
31	<i>Carcharhinus amblyrhynchos</i> (Bleeker, 1856)	Blacktail Reef Shark	SHL
31	<i>Carcharhinus amboinensis</i> (Müller & Henle, 1839)	Pigeye Shark	SHL
33	<i>Carcharhinus borneensis</i> (Bleeker, 1859)	Borneo Shark	SHL
34	<i>Carcharhinus brevipinna</i> (Müller & Henle, 1839)	Spinner Shark	SHL
35	<i>Carcharhinus dussumieri</i> (Müller & Henle, 1839)	Whitecheek Shark	SHL
36	<i>Carcharhinus falciformis</i> (Müller & Henle, 1839)	Silky Shark	SHO
9	<i>Carcharhinus leucas</i> (Müller & Henle, 1839)	Bull Shark	SHF
37	<i>Carcharhinus limbatus</i> (Müller & Henle, 1839)	Blacktip Shark	SHL
38	<i>Carcharhinus macloti</i> (Müller & Henle, 1839)	Hardnose Shark	SHL
	ORDER: CARCHARHINIFORMES	GROUND SHARKS	
	Family Carcharhinidae	Requiem Sharks	
39	<i>Carcharhinus melanopterus</i> (Quoy & Gaimard, 1824)	Blacktip Reef Shark	SHL
40	<i>Carcharhinus plumbeus</i> (Nardo, 1827)	Sandbar Shark	SHS
41	<i>Carcharhinus sealei</i> (Pietschmann, 1913)	Blackspot Shark	
42	<i>Carcharhinus sorrah</i> (Müller & Henle, 1839)	Spot-tail Shark	SHL
43	<i>Carcharhinus tjtjtjot</i> (Bleeker, 1852)	Indonesian Whaler Shark	SHL
44	<i>Glyphis gangeticus</i> (Müller & Henle, 1839)	Ganges Shark	FWO
45	<i>Glyphis sp.</i> [Last et al., 2010]	Mukah River Shark	SHF
46	<i>Lamiopsis tephrodes</i> (Fowler, 1905)	Borneo Broadfin Shark	SHF
47	<i>Loxodon macrorhinus</i> Müller & Henle, 1839	Sliteye Shark	SHL
48	<i>Prionace glauca</i> (Linnaeus, 1758)	Blue Shark	SHO
49	<i>Rhizoprionodon acutus</i> (Rüppell, 1837)	Milk Shark	SHL
50	<i>Rhizoprionodon oligolinx</i> Springer, 1964	Gray Sharpnose Shark	SHL

51	<i>Scoliodon laticaudus</i> Müller & Henle, 1838	Spadenose Shark	SHL
52	<i>Scoliodon macrorhynchus</i> (Bleeker, 1852)	Pacific Spadenose Shark	SHL
53	<i>Triaenodon obesus</i> (Rüppell, 1837)	Whitetip Reef Shark	SHL
<b>Family Galeocerdonidae</b>		<b>Tiger Sharks</b>	
54	<i>Galeocerdo cuvier</i> (Péron & Lesueur, 1822)	Tiger Shark	SSO
<b>Family Sphyrnidae</b>		<b>Hammerhead Sharks</b>	
55	<i>Eusphyra blochii</i> (Cuvier, 1817)	Winghead Shark	SHL
56	<i>Sphyrna lewini</i> (Griffith & Smith, 1834)	Scalloped Hammerhead	SHL
57	<i>Sphyrna mokarran</i> (Rüppell, 1837)	Great Hammerhead	SHL
<b>Family Centrophoridae</b>		<b>Gulper Sharks</b>	
58	<i>Centrophorus moluccensis</i> Bleeker, 1860	Smallfin Gulper Shark	SHS
<b>ORDER: SQUALIFORMES</b>		<b>DOG FISH SHARKS</b>	
<b>Family Squalidae</b>		<b>Dogfish Sharks</b>	
59	<i>Squalus altipinnis</i> Last, White & Stevens, 2007	Western Highfin Spurdog	SHS
60	<i>Squalus edmundsi</i> White, Last & Stevens, 2007	Edmund's Spurdog	SOC
61	<i>Squalus megalops</i> (Macleay, 1881)	Shortnose Spurdog	SHS
<b>ORDER SQUATINIFORMES</b>		<b>ANGEL SHARKS</b>	
<b>Family Squatinidae</b>		<b>Angel Sharks</b>	
62	<i>Squatina tergocellatoides</i> Chen, 1963	Ocellated Angel Shark	SHL
<b>Family Narkidae</b>		<b>Sleeper Rays</b>	
63	<i>Narke dipterygia</i> (Bloch & Schneider, 1801)	Spot-tail Sleeper Ray	SHL
64	<i>Temera hardwickii</i> Gray, 1831	Finless Sleeper ray	SHL
<b>ORDER: TORPEDINIFORMES</b>		<b>ELECTRIC RAYS</b>	
<b>Family Narcinidae</b>		<b>Numbfishes</b>	
65	<i>Narcine breviliabiata</i> Bessednov, 1966 Shortlip Electric Ray	Shortlip Numbfish/ Shortlip Electric Ray	SHL
66	<i>Narcine brunnea</i> Annandale, 1909	Brown Numbfish	SHL
67	<i>Narcine lingula</i> Richardson, 1846	Chinese Numbfish	SHL
68	<i>Narcine maculata</i> (Shaw, 1804) Darkfinned Numbfish	Darkspotted Numbfish/ Darkfinned Numbfish	SHL
69	<i>Narcine prodorsalis</i> Bessednov, 1966	Tonkin Numbfish	SHL
70	<i>Narcine timlei</i> (Bloch & Schneider, 1801)	Brown Numbfish / Spotted Numbfish	SHL

	<b>Family Rhinobatidae</b>	<b>Guitarfishes</b>	
77	<i>Rhinobatos borneensis</i> Last, Séret & Naylor, 2016	Borneo Guitarfish	SHL
72	<i>Rhinobatos jimbaranensis</i> Last, White & Fahmi, 2006	Jimbaran Guitarfish	SHL
73	<i>Rhinobatos schlegelii</i> Müller & Henle, 1841	Brown Guitarfish	SHL
	<b>Family Rhinidae</b>	<b>Shark Rays</b>	
74	<i>Rhina ancylostomus</i> Bloch & Schneider, 1801	Shark Ray	SHL
75	<i>Rhynchobatus australiae</i> Whitley, 1939	Bottlenose Wedgefish	SHL
76	<i>Rhynchobatus laevis</i> (Bloch & Schneider, 1801)	Smoothnose Wedgefish	SHL
77	<i>Rhynchobatus springeri</i> Compagno & Last, 2010	Broadnose Wedgefish	SHL
	<b>ORDER: RHINOPRISTIFORMES</b>	<b>GUITARFISHES</b>	
	<b>Family Glaucostegidae</b>	<b>Giant Guitarfishes</b>	
78	<i>Glaucostegus halavi</i> (Forsskål, 1775)	Halavi Guitarfish	SHL
79	<i>Glaucostegus thouin</i> (Anonymous [Lacepède], 1798)	Clubnose Guitarfish	SHL
80	<i>Glaucostegus typus</i> (Anonymous [Bennett], 1830)	Giant Guitarfish	SHL
	<b>Family Pristidae</b>	<b>Sawfishes</b>	
81	<i>Anoxypristis cuspidata</i> (Latham, 1794)	Narrow Sawfish	SHF
82	<i>Pristis pristis</i> (Linnaeus, 1758)	Largetooth Sawfish	SHF
83	<i>Pristis zijsron</i> Bleeker, 1851	Green Sawfish	SHF
	<b>Family Rajidae</b>	<b>Skates</b>	
84	<i>Dipturus kwangtungensis</i> (Chu, 1960)	Kwangtung Skate	SHS
85	<i>Okamejei cairae</i> Last, Fahmi & Ishihara, 2010	Borneo Sand Skate	SHS
86	<i>Okamejei hollandi</i> (Jordan & Richardson, 1909)	Yellow-spotted Skate/ Holland Skate	SHL
87	<i>Orbiraja jensenae</i> (Last & Lim, 2010) Sulu Sea Skate	Sulu Ring Skate/ Sulu Sea Skate	SHS
	<b>ORDER RAJIFORMES</b>	<b>SKATES</b>	
	<b>Family Anacanthobatidae</b>	<b>Legskates</b>	
88	<i>Sinobatis borneensis</i> (Chan, 1965)	Borneo Leg Skate	SHS

	Family Dasyatidae	Whiptail Stingrays	
89	<i>Bathytoshia lata</i> (Garman, 1880)	Brown Stingray	SHL
90	<i>Brevitrygon imbricata</i> (Bloch & Schneider, 1801)	Bengal Whipray/Scaly Stingray	SHL
91	<i>Brevitrygon heterura</i> (Bleeker, 1852)	Dwarf Whipray	SHL
92	<i>Fluvitrygon kittipongi</i> (Vidthayanon & Roberts, 2006)	Roughback Whipray	FWO
93	<i>Fluvitrygon signifer</i> (Compagno & Roberts, 1982) Stingray	White-edge Freshwater Whipray/White-rimmed	FWO
94	<i>Hemitrygon bennetti</i> (Müller & Henle, 1841)	Bennett's Stingray	SHL
95	<i>Hemitrygon fluviorum</i> (Ogilby, 1908)	Estuary Stingray	SHL
96	<i>Hemitrygon parvonigra</i> (Last & White, 2008)	Dwarf Black Stingray	SHL
97	<i>Himantura fava</i> (Annandale, 1909)	Honeycomb Whipray	SHL
98	<i>Himantura leoparda</i> Manjaji- Matsumoto & Last, 2008	Leopard Whipray	SHL
99	<i>Himantura uarnak</i> (Gmelin, 1789)	Coach Whipray	SHL
100	<i>Himantura undulata</i> (Bleeker, 1852) Honeycomb Whipray	Leopard Whipray/ Honeycomb Whipray	SHL
101	<i>Maculabatis astra</i> (Last, Manjaji- Matsumoto & Pogonoski, 2008)	Blackspotted Whipray	SHL
102	<i>Maculabatis gerrardi</i> (Gray, 1851)	Whitespotted Whipray	SHL
103	<i>Maculabatis macrura</i> (Bleeker, 1852)	Sharpnose Whipray	SHL
104	<i>Maculabatis pastinacoides</i> (Bleeker, 1852)	Round Whipray	SHL
105	<i>Megatrygon microps</i> (Annandale, 1908)	Smalleye Stingray	SHL
106	<i>Neotrygon caeruleopunctata</i> Last, White & Serét, 2016	Bluespotted Maskray	SHL
107	<i>Neotrygon malaccensis</i> Borsa, Arlyza, Hoareau & Shen, 2017	Malacca Strait Bluespotted Maskray	SHL
108	<i>Neotrygon orientalis</i> Last, White & Serét, 2016	Oriental Bluespotted Maskray	SHL
109	<i>Neotrygon picta</i> Last & White, 2008	Peppered Maskray	SHL
110	<i>Neotrygon varidens</i> (Garman, 1885)	Mahogany Maskray	SHL
111	<i>Pastinachus ater</i> (Macleay, 1883)	Broad Cowtail Ray	SHL
112	<i>Pastinachus gracilicaudus</i> Last & Manjaji-Matsumoto, 2010	Narrowtail Stingray	SHL
113	<i>Pastinachus solocirostris</i> Last, Manjaji & Yearsley, 2005	Roughnose Cowtail Stingray	SHL
114	<i>Pateobatis bleekeri</i> (Blyth, 1860)	Bleeker's Whipray	SHL

	<b>Family Dasyatidae</b>	<b>Whiptail Stingrays</b>	
115	<i>Pateobatis fai</i> (Jordan & Seale, 1906)	Pink Whipray	SHL
116	<i>Pateobatis jenkinsii</i> (Annandale, 1909)	Jenkins' Whipray	SHL
117	<i>Pateobatis uarnacoides</i> (Bleeker, 1852)	Whitenose Whipray	SHL
118	<i>Pteroplatytrygon violacea</i> (Bonaparte, 1832)	Pelagic Stingray	OCE
119	<i>Urogymnus asperimus</i> (Bloch & Schneider, 1801)	Porcupine Whipray	SHL
120	<i>Urogymnus granulatus</i> (Macleay, 1883)	Mangrove Whipray	SHF
121	<i>Urogymnus lobistoma</i> (Manjaji-Matsumoto & Last, 2006)	Tubemouth Whipray	SHL
122	<i>Urogymnus polylepis</i> (Bleeker, 1852)	Giant Freshwater Whipray	SHF
123	<i>Taeniura lymma</i> (Fabricius, 1775)	Bluespotted Fantail Ray	SHL
124	<i>Taeniurops meyeri</i> (Müller & Henle, 1841)	Blotched Stingray	SHL
125	<i>Telatrygon cf. acutirostra</i>	Sharpnose Ray	SHL
126	<i>Telatrygon biasa</i> (Last, White & Naylor, 2016)	Indonesian Sharpnose Ray	SHL
	<b>Family Gymnuridae</b>	<b>Butterfly Rays</b>	
127	<i>Gymnura poecilura</i> (Shaw, 1804)	Longtail Butterfly Ray	SHL
128	<i>Gymnura zonura</i> (Bleeker, 1852)	Zonetail Butterfly Ray	SHL
	<b>Family Plesiobatidae</b>	<b>Giant Stingarees</b>	
129	<i>Plesiobatis daviesi</i> (Wallace, 1967) Deep-water Stingray	Giant Stingaree/	SLO
	<b>Family Urolophidae</b>	<b>Round rays</b>	
130	<i>Urolophus expansus</i> McCulloch, 1916	Wide Stingaree	SHS

<b>BATOIDS</b>			
<b>ORDER: MYLIOBATIFORMES</b>		<b>STINGRAYS</b>	
<b>Family Aetobatidae</b>		<b>Pelagic Eagle Rays</b>	
1	<i>Aetobatus flagellum</i> (Bloch & Schneider, 1801)	Longhead Eagle Ray	SHL
2	<i>Aetobatus ocellatus</i> (Kuhl, 1823)	Whitespotted Eagle Ray	SHL
<b>Family Myliobatidae</b>		<b>Eagle Rays</b>	
3	<i>Aetomylaeus maculatus</i> (Gray, 1834)	Mottled Eagle Ray	SHL
4	<i>Aetomylaeus nichofii</i> (Bloch & Schneider, 1801)	Banded Eagle Ray	SHL
5	<i>Aetomylaeus vespertilio</i> (Bleeker, 1852)	Ornate Eagle Ray	SHL
6	<i>Myliobatis hamlyni</i> Ogilby, 1911	Purple Eagle Ray	SHL
<b>Family Rhinopteridae</b>		<b>Cownose Rays</b>	
7	<i>Rhinoptera javanica</i> Müller & Henle, 1841	Javan Cownose Ray	SHL
8	<i>Rhinoptera jayakari</i> Boulenger, 1895	Shorttail Cownose Ray	SHL
<b>Family Mobulidae</b>		<b>Devilrays</b>	
9	<i>Mobula alfredi</i> (Kreffft, 1868)	Alfred manta	SHO
10	<i>Mobula birostris</i> (Walbaum, 1792)	Giant Manta Ray	SHO
11	<i>Mobula mobular</i> (Bonnaterre, 1788)	Giant Devil Ray	SHO
12	<i>Mobula kuhlii</i> (Valenciennes, 1841)	Shortfin Devil Ray	SHO
13	<i>Mobula thurstoni</i> (Lloyd, 1908).	Bentfin Devil Ray	SHO

## APPENDIX 2:

### Landings of Shark and Ray in Malaysia from 1982 to 2023

Year	Sharks (mt)	Sharks (%)	Rays (mt)	Rays (%)	Shark and Ray (mt)	Shark and Ray (%)	Marine Fisheries (mt)
1982	4,444	0.7	6,348	0.9	10,792	1.6	678,663
1983	5,016	0.7	6,044	0.8	11,060	1.5	727,494
1984	5,281	0.9	5,795	1.0	11,076	1.8	603,273
1985	4,745	0.8	5,440	0.9	10,185	1.8	577,254
1986	4,820	0.9	7,029	1.3	11,849	2.1	561,591
1987	4,699	0.5	10,550	1.2	15,249	1.8	859,443
1988	4,677	0.6	11,517	1.4	16,194	2.0	825,631
1989	4,264	0.5	9,414	1.1	13,678	1.5	882,492
1990	4,140	0.4	13,220	1.4	17,360	1.8	951,307
1991	5,677	0.6	11,485	1.3	17,162	1.9	911,933
1992	7,240	0.7	13,531	1.3	20,771	2.0	1,023,516
1993	6,294	0.6	14,604	1.4	20,898	2.0	1,047,350
1994	6,889	0.6	14,000	1.3	20,889	2.0	1,065,585
1995	8,437	0.8	15,707	1.4	24,144	2.2	1,108,436
1996	8,080	0.7	15,928	1.4	24,008	2.1	1,126,689
1997	7,483	0.6	17,282	1.5	24,765	2.1	1,168,973
1998	7,839	0.6	16,104	1.3	23,943	2.0	1,215,206
1999	8,092	0.6	17,033	1.4	25,125	2.0	1,248,402
2000	7,948	0.6	16,573	1.3	24,521	1.9	1,285,696
2001	8,663	0.7	16,532	1.3	25,195	2.0	1,231,289
2002	8,226	0.6	15,941	1.3	24,167	1.9	1,272,078
2003	8,697	0.7	19,253	1.5	27,950	2.2	1,283,252
2004	8,299	0.6	16,753	1.3	25,052	1.9	1,331,647
2005	9,165	0.8	15,930	1.3	25,095	2.1	1,209,581
2006	7,877	0.6	16,044	1.2	23,921	1.7	1,379,726
2007	7,684	0.6	14,079	1.0	21,763	1.6	1,381,419
2008	7,345	0.5	15,642	1.1	22,987	1.6	1,394,503
2009	7,250	0.5	15,093	1.1	22,343	1.6	1,393,207
2010	6,793	0.5	13,769	1.0	20,562	1.4	1,428,865
2011	5,976	0.4	13,022	0.9	18,998	1.4	1,373,080
2012	6,537	0.4	15,612	1.1	22,149	1.5	1,472,242
2013	7,834	0.5	15,775	1.1	23,609	1.6	1,482,898
2014	7,389	0.5	17,275	1.2	24,664	1.7	1,458,128
2015	7,624	0.5	12,908	0.9	20,532	1.4	1,486,051
2016	6,077	0.4	12,281	0.8	18,358	1.2	1,574,447
2017	6,791	0.5	13,311	0.9	20,102	1.4	1,465,113
2018	6,487	0.4	11,993	0.8	18,479	1.2	1,453,000
2019	5,883	0.4	11,496	0.8	17,379	1.2	1,455,446
2020	4,924	0.4	9,750	0.7	14,674	1.1	1,383,299
2021	5,318	0.4	9,990	0.8	15,308	1.2	1,328,041
2022	4,578	0.3	10,980	0.8	15,558	1.2	1,308,415
2023	5,736	0.5	11,318	0.9	17,054	1.4	1,270,277



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