

# REPUBLIC OF KENYA



## State Department for Blue Economy and Fisheries

### NATIONAL PLAN OF ACTION FOR THE CONSERVATION AND MANAGEMENT OF SHARKS IN KENYA'S MARINE WATERS

2023-2028



April 2023

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**ENDORSEMENT AND COMMENCEMENT**

By virtue of the powers conferred upon the Cabinet Secretary responsible for Fisheries, under the provisions of Parts I and II of the Fisheries Management and Development Act of 2016 ( No. 35), the implementation of the National Plan of Action for Sharks (NPOA-Sharks) for Kenya is hereby endorsed and notice given to commence on the ----  
-----day of the month of ----- in the year 2023 by the seal and signature of the Cabinet Secretary responsible for Fisheries in Kenya.

.....  
**Honorable Salim Mvurya**

Cabinet Secretary for Mining, Blue Economy and Maritime Affairs

## **FOREWORD**

Kenya is endowed with vast resources within its 200 nm EEZ. The resources include among others; the coastal ecosystems such as mangroves, coral reefs and seagrass beds, the marine biodiversity such as turtles, birds, fishes, mammals, sharks, and rays. Kenya has also designated 4 marine protected areas and reserves for the conservation of its marine biodiversity. The country has a high diversity of sharks and rays that have socio-economic, ecological, and cultural value, and is obligated to conserve this biodiversity through provisions of a number of laws including the Kenya Fisheries Development and Management Act of 2016 and the Wildlife Conservation and Management Act of 2013. Kenya is a member of a number of international treaties and conventions such as the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the Convention on Migratory Species (CMS) and its Sharks-MOU, the Convention on Biological Diversity (CBD), among others. This shark plan is a fulfillment of Kenya's obligation to instruments and to the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) which requires national actions to conserve and sustainably manage shark and ray species. The plan has been developed through a multi-stakeholder engagement process, it identifies the issues affecting the sustainable management of sharks and rays in Kenya, and provides the strategies necessary to mitigate the issues. Kenya's NPOA-Sharks is anchored on the principles of sustainability, equity, and an ecosystem-based approach to fisheries management. It aims to sustainably manage the shark and ray resources for the socio-economic benefits of all citizens and is in line with Kenya's Vision 2030 and the UN's Sustainable Development Goals (SDGs). A number of stakeholders and partners were involved in the development of this NPOA-Sharks, and I, on behalf of the Ministry of Mining, Blue Economy and Maritime Affairs, like to particularly thank the World Bank Funded, Kenya Marine Fisheries Socioeconomic Development Project (KEMFSED) and the Wildlife Conservation Society (WCS), for financial support and the Kenya Fisheries Service (KeFS) for spearheading the process. This plan will contribute to the sustainable management of Kenya's marine biodiversity for the benefit of the present and future generations of her citizens.

**Honorable Salim Mvurya**

Cabinet Secretary for Mining, Blue Economy and Maritime Affairs

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**LIST OF ACRONYMS**

BMU	Beach Management Unit
BMSY	Biomass at Maximum Sustainable Yield
BRD	Bycatch Reduction Device
CBD	Convention on Biological Diversity
CBO	Community-Based Organization
CCRF	FAO's Code of Conduct for Responsible Fisheries
CITES	Convention on the International Trade in Endangered Species of Flora and Fauna
CMS	Convention on Migratory Species
CORDIO	Coral Reef Development In the Indian Ocean
COFI	FAO’s Committee on Fisheries
CS	Cabinet Secretary
EAFM	Ecosystem Approach to Fisheries Management
ERA	Ecological Risk Assessment
EEZ	Exclusive Economic Zone
EMCA	The Environmental Management and Coordination Act
F	Instantaneous Fishing Mortality index
FAO	Food and Agriculture Organization of the UN
FMDA	Fisheries management and development act of 2016
F <sub>MSY</sub>	Fishing mortality at maximum sustainable yield
ICZM	Integrate Coastal Zone Management
iFIMS	Integrated Fisheries Information Management System
IOTC	Indian Ocean Tuna Commission
IPOA	International Plan of Action
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unreported and Unregulated Fishing
KeFS	Kenya Fisheries Service
KMFRI	Kenya Marine and Fisheries Research Institute
KWS	Kenya Wildlife Service
LMMA	Locally Managed Marine Areas
MCS	Monitoring, Control and Surveillance
MSY	Maximum Sustainable Yield
NDF	Non-detriment Finding
NGO	Non-governmental Organization
NPOA	National Plan of Action
PSMA	FAO’s Port State Measures Agreement
RFMO	Regional fisheries management organization
SAR	Shark Assessment Report
SPIC	Shark Plan Implementation Committee

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TBT	Agreement on Technical Barriers to Trade
TED	Turtle Excluder Device
WCS	Wildlife Conservation Society
WRTI	Wildlife Research and Training Institute

**GLOSSARY OF TERMS**

Artisanal fishery	Small scale traditional fisheries that may be carried out for subsistence or commercial purposes in which the owner is directly involved in the day-to-day running of the enterprise and relatively small amounts of capital are used.
Biodiversity	Biodiversity or biological diversity is the variety and variability of life on Earth. Biodiversity is a measure of variation at the genetic, species, and ecosystem level.
Bycatch	Part of a catch of a fishing unit taken incidentally in addition to the target species towards which fishing effort is directed and of which some or all of it may be returned to the sea as discards, usually dead or dying.
Byproduct	Part of the bycatch that is retained because of its commercial value
Critical habitat	Habitat vital to the successful completion of the species lifecycle (e.g. pupping grounds, nurseries, spawning area, etc) and/or areas where the species is particularly vulnerable (e.g. aggregation areas, migration corridors).
Directed Fisheries	Fishing that is directed at a certain species or group of species.
Discard	To release or return fish to the sea, dead or alive, whether or not such fish are brought fully onboard a fishing vessel.
Ecosystem	An ecosystem consists of all the organisms and the physical environment with which they interact. These biotic and abiotic components are linked together through nutrient cycles and energy flows.
Endangered	A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.
Finning	The practice of removing the fins and discarding the carcass, usually pertaining to sharks.
Habitat	An area containing suitable living conditions of a species.
Longline	Longline fishing is a commercial fishing angling technique that uses a long main line with baited hooks attached at intervals via short branch lines called snoods.
Malthusian overfishing	Occurs when poor fishers, continue to overexploit fisheries resources in the face of declining catches and induce wholesale resource destruction in their effort to maintain their incomes due to lack of alternative sources of livelihoods.
Non-directed fisheries	Are those for which the gear is not specifically set, although they may have immediate commercial value and be a desirable component of the catch.
Precautionary approach	Is used for the implementation of the precautionary principle and should be guided by: 1) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and 2) an assessment of the risk-weighted consequences of the various options.
Stock	Means the part of a fish population which is under consideration from the point of view of actual or potential utilization.
Stakeholder	An entity (individuals or organizations) having a stake or interest in a

	physical resource, ecosystem service, institution, or social system, or someone who is or may be affected by a public policy.
“Sharks”	Is used herein to refer to members of the class Chondrichthyes including true sharks, rays, skates and Chimaeras
Sustainable use	The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.
Vulnerability	A term equivalent to “catchability” but usually applied to separate parts of a stock, for example those of a particular size, or those living in a particular part of the range.

## **EXECUTIVE SUMMARY**

Kenya has a rich diversity of sharks and rays in her EEZ estimated at about 100 species. Sharks and rays play important socio-economic roles including regulation of marine biodiversity in addition to supporting local livelihoods through fisheries and trade. The shark and ray species are mostly taken as bycatch by prawn trawlers in the Malindi-Ungwana Bay, in tuna longline vessels, and by artisanal longline, gillnet and handline fishery. Although there is limited directed shark fisheries in Kenya, the artisanal fishery continues to record shark landings with an average of 1000 MT/year reported in 2020. Fishing forms the greatest threat to sharks globally. In Kenya, shark and ray catches are estimated to have declined by about 86% from the early 1980s to the year 2020, calling for a more proactive approach to conservation and management of the stocks. About 56% of the shark and 60% of the ray species in Kenyan marine waters are those globally threatened with extinction according to the IUCN Red List of Threatened Species. This National Plan of Action for the Conservation and Management Sharks and Rays (NPOA-Sharks) has the overall goal of providing a framework for the conservation and management of shark and ray stocks in Kenya, based on the sustainability, equity, and precautionary principles. The NPOA-Sharks for Kenya has been developed following a consultative process involving different stakeholders (e.g. artisanal fishers, BMUs, fishing industry, fisheries managers, research scientists, policy makers, and the NGOs). The action plan is supported by a national Shark Assessment Report (SAR) and an Ecological Risk Assessment (ERA) of the vulnerability of the species to overfishing following an ecosystem approach to fisheries (EAF) management. This NPOA-Sharks identifies several challenges and issues in the conservation and management of shark and ray species in Kenya. The action plan is divided into eight chapters as follows: Chapter 1 provides an introductory background to sharks, Chapter 2 is an overview of the international conservation status of sharks, Chapter 3 includes a summary of the status of sharks and shark fishery in Kenya, Chapter 4 provides the structure and framework of NPOA-Sharks for Kenya that includes the goals, objectives, vision and mission of the plan, Chapter 5 highlights the stakeholder-generated Issues

and Challenges relevant to conservation and management of sharks and rays in Kenya, Chapter 6 provides the Actions necessary to mitigate the identified conservation and issues and challenges, Chapter 7 contains the logical framework for the implementation of the Actions and for monitoring the implementation process, while Chapter 8 provides a summary of the salient features necessary for the initiation and implementation of the NPOA-Sharks for Kenya. The four-year (2023-2026) plan aims to contribute to the conservation and management of shark and ray species, and forms part of Kenya's obligation to the FAO's International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks).

## CHAPTER 1

### 1.0. INTRODUCTION

#### 1.1. Background: Overview of sharks and their conservation

The chondrichthyans are a group of cartilaginous fishes that include sharks, rays, skates and chimaeras. The sharks, rays and skates belong to the sub-class elasmobranchii and are morphologically different from the sub-class Holocephali that contains the chimaeras or ghost sharks. The IUCN global red list assessment estimates that there are about 1200 species of sharks and rays spread in all the oceans. It is also estimated that about one-third of sharks and rays are threatened with extinction. Most of the global threats to the sharks and rays derives from their high vulnerability to overfishing as incidental and directed catches in the multi-gear fisheries. There has been concerns over the historical (1950-2000) rapid increase in chondrichthyan catches and the effects this has had on populations of some shark species in several areas of the world's oceans. This concern is motivated by the unique life-history traits of the group which make them highly vulnerable to overexploitation. Sharks are highly vulnerable to overfishing because they have closed stock-recruitment relationships, long recovery times in response to over-fishing (due to low biological productivity because of late sexual maturity, few offsprings, albeit with low natural mortality) and complex spatial structures (size/sex segregation and seasonal migration).

*The term "sharks" is used hereinafter to refer collectively to the species of chondrichthyans (sharks, rays, skates and chimaeras) occurring in Kenya's EEZ.*

The greatest and primary threat to sharks identified in the IUCN Red List assessments of almost all threatened sharks is overfishing. Other threats to sharks include non-fishing pressures such as environmental pollution, degradation of critical habitats, and climate change effects. The paucity of quality data, management tools, and low political goodwill to conserve them confound the vulnerability of sharks to overexploitation.

The sharks themselves support important ecological functions in addition to sustaining livelihoods through the provision of food and other economic benefits. Sharks have top-down predatory effects that maintain ecosystem functioning and species diversity, and ecological services as non-material benefits to humans. Globally, annual catches of sharks reported by FAO have tripled since 1950 reaching an all-time high in 2000 (868,000 MT) followed by about 22% lower catches (680,000 MT) in 2018. This decline in catches is attributed to increased fishing pressure (in response to increased demand for shark products) and the high vulnerability of the group to fisheries due to their life-history characteristics. A precautionary approach to the management of sharks is therefore required (especially where scientific evidence on stocks is scarce) if populations are to remain viable, fisheries sustainable, and threatened species not driven to extinction.

In Kenya, the marine fish artisanal landings are reported in the Kenya Fisheries Service (KeFS) annual statistical bulletins to be about 25,000 MT for 2020 of which about 1000 MT are from sharks and rays. However, the national record on shark landings is estimated only from artisanal catches and precludes catches from the commercial prawn trawlers, the industrial longlines and purse seines, making the actual shark and ray off-takes to be considerably higher. Historically artisanal shark landings peaked at about 3,100 MT in 1978 followed by a consistent long-term decline to about 490 MT in 2010 and a recent increase to about 1000 MT in 2020 (see Kenya's shark assessment report).

The decline in artisanal landings of sharks in Kenya is attributable to long-term population changes caused by increased fishing efforts and increased efficiency of the gears over the years, and a lack of robust management measures. Information gathered from shark-gear interactions, institutional databases, distribution ranges, and fisher interviews indicate that there are about 100 species of sharks and rays in Kenyan marine waters spread in 69 genera and 35 families (see annexes 1 and 2). Of these

species, 56% and 60% of sharks and rays, respectively, are globally threatened with extinction, while more than 12% are Data Deficient making the evaluation of their conservation status difficult.

A Productivity and Susceptibility Analysis (PSA) on the Kenyan shark stocks indicated that 30 species are highly vulnerable to the multi-gears operating within the EEZ, with 5 of the highly vulnerable species (*Sphyrna lewini*, *Pseudoginglymostoma brevicaudatum*, *Rhina ancylostoma*, *Rhynchobatus djiddensis*, *Rhynchobatus laevis*) being among those Critically Endangered globally and requiring more local protection. Sharks provide livelihood sources through fishing to an estimated 400 fishers in Kenya. Shark meat is culturally revered in certain coastal communities, while the export of shark fins is gradually increasing. The Government of Kenya, through the State Department for Blue Economy and Fisheries (SDBE&F) and the KeFS, is committed to the conservation and management of these aquatic resources and to their long-term sustainable use. This NPOA-Sharks is a step towards the fulfillment of Kenya's international obligations to shark conservation and provides a framework for the management of sharks and rays for the long-term benefit of all Kenyans.

## CHAPTER 2

### 2.0. INTERNATIONAL CONSERVATION STATUS OF SHARKS

#### 2.1. Catches, threats and conservation

Global Shark catches now average about 60,000-80,000 MT according to the data reported to the FAO. There have been historical increases in landings of sharks since the mid-1980s. The increased landings were primarily caused by the rapid increase in the demand for shark products especially shark fins, meat and cartilage in the Asian market. The increased catches of sharks have led to population declines in some stocks with possible localized extinction of some shark species in the Indian and Atlantic oceans, and the Gulf of Mexico. The historical (1950-1980) increases in shark landings in the face of poor data and information on stocks led to a global concern on the sustainability of the shark fisheries and the threat of species extinction. It is estimated by the IUCN's Red List Assessment process that about one-third (32.6%, n = 391 species) of the about 1200 species of sharks, rays and chimaeras are threatened with extinction as at 2021. This extinction rate is up from the one-quarter (24%) of the species threatened with extinction in 2004. According to Dulvy et al (2021), overfishing is the universal threat affecting all 391 threatened species and is the sole threat for 67.3% of species and interacts with three other threats for the remaining third: loss and degradation of habitat (31.2% of threatened species), climate change (10.2%), and pollution (6.9%). Species are disproportionately threatened in tropical and subtropical coastal waters.

The wedgefishes, giant-guitarfishes, sawfishes, devil rays, and eagle rays are now thought to be the most imperiled marine fish families. Historically, shark landings have been poorly recorded in the statistics and detailed records are still missing for most countries this situation heightened the concern on threats to sharks. Only about one-third of the reported global catches is recorded to species level. In most countries landing records are not specified to species level and are often aggregated as "sharks

and rays”. Additionally, the species are given low priority in management plans with no-to-poor harvest regulations in most countries. The lack of a global framework for regulating shark catches worsens the national inadequacies in managing sharks thereby threatening their sustainability. Nonetheless, there are now a number of regulatory frameworks such as; the Convention for Migratory Species (CMS) and its Sharks MoU, the Convention on International Trade in Endangered Species of Wild Fauna and Flora-CITES, the FAO’s International Plan of Action for the Conservation and Management of Sharks- IPOA Sharks, RFMOs, among others, that can be applied to reinforce national initiatives.

## CHAPTER 3

### 3.0. THE STATUS OF SHARK AND RAY FISHERIES IN KENYA

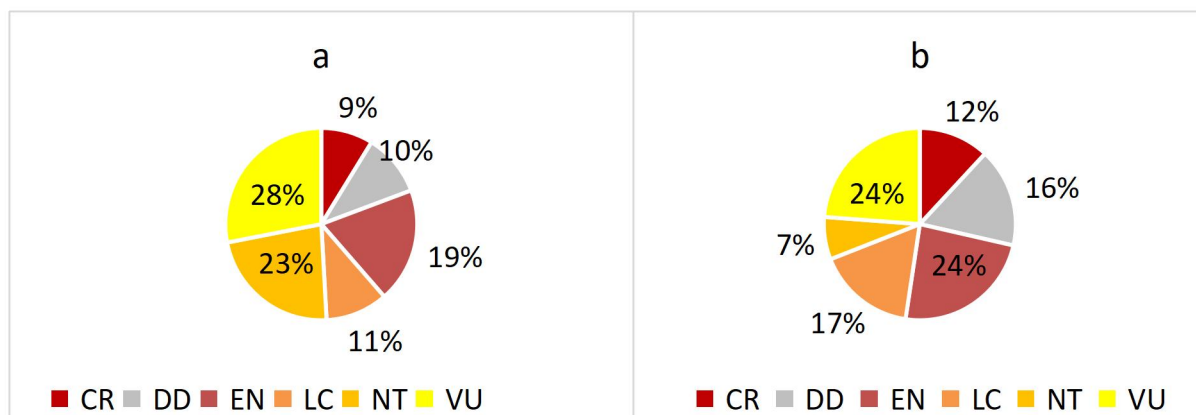
#### 3.1. Kenya's fisheries landing sharks as target and bycatch

Kenya has jurisdictional rights over the living resources in its 200-nm Exclusive Economic Zone (EEZ), including sovereignty over the 12-nm territorial waters, and licenses artisanal fishers as well as industrial and recreational vessels to carry out fishing within its EEZ. Kenyan fisheries are largely small-scale (subsistence and artisanal), which produce over 90% of the country's recorded annual marine fish landings. Also in operation in the country's waters are a recreational fishing fleet, a domestic semi-industrial shrimp trawling fleet, a domestic industrial longline tuna fishery and, depending on the prevailing licensing policy, a foreign-owned industrial tuna longline and purse seine fleet. The majority of shark species caught in Kenya are reported to be from the artisanal and shrimp trawl fisheries, and tend to be sold and utilized locally for meat. In a reconstruction of Kenya's marine fisheries landings from 1950 to 2010, Le Manach and others, and the Sea Around Us Project found sharks to be a key component, making up an estimated 5.3% of landings. However, the quantities of elasmobranchs caught in Kenya's industrial fisheries are not well documented. Although there is no record of targeted industrial shark fisheries in Kenya's waters, trade data for shark products suggests that they do exist. There are also reports of domestic longline fishery that is believed to target sharks for meat and fins. Kenya also has a few aquarium traders dealing in live shark export trade and who depend on non-detriment findings (NDF) by the KeFS in order to export certain species.

#### 3.2. Diversity of sharks and rays on the Kenyan coast

A total of 99 elasmobranch species (sharks, rays and skates) is estimated to occur in Kenya's marine waters consisting of 57 species of sharks and 42 species of rays (see annexes 1 and 2). This information has been gathered from survey reports, a desktop

review of the fisheries, species straddling Kenyan waters as documented in institutional and web-based databases. Additional information on gear-species interactions and species occurrence likelihood has been obtained through expert and fisher consultations. The estimated species richness relates very well with IUCN Red List estimates of 102 species thought to occur on the Kenyan coast according to the IUCN 2022 Red List. Of the 57 species of sharks, 56% are threatened with extinction at the global level, of which 28% are Vulnerable (VU), while 19.0% are Endangered (EN) and 9% are Critically Endangered (CR) according to the IUCN Red List of Threatened Species ([www.iucnredlist.org](http://www.iucnredlist.org), release 2022-1) (Figure 1a). For the ray species, 60% of the species (n = 42) potentially occurring in Kenyan waters are assessed to be those threatened at a global scale (Figure 1b). Of the threatened species, 24% are Vulnerable and equally 24% Endangered, while 12% are Critically Endangered. A relatively high proportion of ray species (16%) have a Data Deficient (DD) status compared to those of sharks (10%). A higher proportion of sharks (23%) have a Near Threatened (NT) status as compared to rays (7%) (Figure 1a and b).



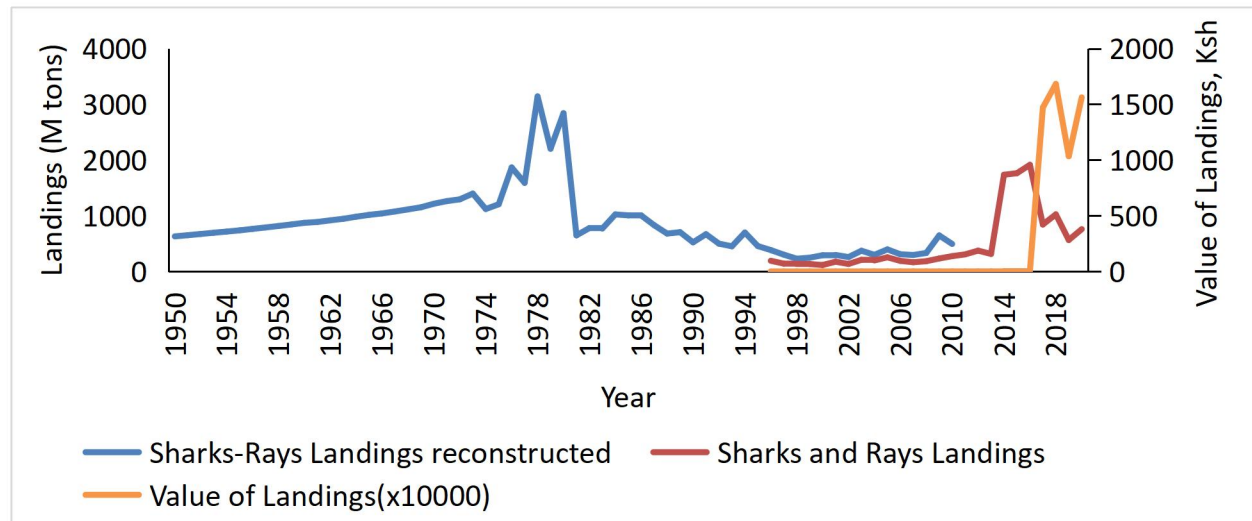
**Fig. 1. Proportion of Kenya's (a) sharks and (b) ray species in different IUCN Red List categories (n = 57 for sharks and 42 for rays)**

### 3.3. Retrospective analysis of landing trends of sharks and rays

The data on landings of sharks are routinely collected by staff of the KeFS from landing beaches spanning the entire coastline of about 640 km. Data collected are aggregated

at the county level (formerly districts) and scaled-up to the national level to form National Annual Statistical Bulletins. Due to the challenges with species identification, the data are lumped into “sharks and rays” making analysis at the species level impossible. The data span many years starting from the 1950’s but records are more prominent from the 1970’s and are mostly reported for artisanal fisheries. There are no long-term data on the catches by the industrial and semi-industrial fisheries catching shark species as bycatch.

A reconstructed pattern of the landings together with the actual data reported by KeFS in the Annual Statistical Bulletins show an initial landing of about 600 MT in 1950 that peaked to about 3,100 MT in 1978 (Figure 2). This was followed by a steep decline of about 79% to a low of about 640 MT in 1981. Subsequently, landings continued to decline to the lowest tonnage years of 1996 (228 MT) to 2004 (298 MT) with a slight rise to 490 MT in 2010. There was therefore an 84% decline in landings from the peak in 1978 to the recent landings in 2010 of 490 MT (Figure 2). Similarly, landings declined by 83% from the early 1980s to 2010. On a decadal scale, the reconstructed data show average landings of 700-1000 MT in the 1950s and 1960s, landings peaked during the 1970s at an average of 1600 MT, followed by average landings of 1028 MT in the 1980s, a ~36% drop. The average landings in the 1990s of 445 MT, showed a further 57% drop from that of the 1980s, indicating the highest decadal drop in shark landings. The KeFS records show a huge and sudden increase in catches between 2013 (314 MT), 2016 (1913 MT,) and 2018 (1024 MT). In the absence of species-specific data and lack of change in management strategy, this increase is unlikely to be due to fishery recovery, calling for a more precautionary approach to manage the fisheries.



**Fig. 2: Long-term trends in the annual recorded landing weights and value of sharks and rays in coastal Kenya from 1994-2018. The reconstructed trend is shown for the landings from 1950-2010 from data sourced from the Sea Around Us Project, UBC, Canada.**

### 3.4. Artisanal, subsistence and recreational fisheries

Artisanal and subsistence fisheries are confined to shallow coastal waters. These fisheries use a variety of gears including; gillnets, handlines, beach seines, basket traps, cast nets, scoop nets, monofilament gillnets, trammel and trolling nets, longlines, traps and spear guns. The sharks are mostly caught using longlines, gillnets, and handlines. Sharks are targeted by some artisanal and subsistence fishers, providing catch for local consumption, and fins for export, and are landed in larger numbers on the north coast in the Malindi-Ungwana Bay ecosystem. Of a total of 13,000 estimated artisanal fishers, the artisanal shark catches are estimated to support about 400 fishers. Of the 4,168 gillnets recorded in Kenya's Marine Frame Survey (2012), 1,458 had a mesh size of 6 inches or greater, which are thought to specifically target sharks.

Removal of shark fins for trade occurs within the artisanal gillnet fisheries but there is no data on the traded volumes. About 16,000 artisanal longline hooks were recorded in Kenya's Marine Frame Survey, with 68% of longline fishers reporting that they targeted sharks (KeFS 2020). Other gear types that catch sharks include small purse seines

targeting sardines and tuna, and trolling lines (used by recreational fishers) targeting tuna, marlin and kingfish. The offshore fishing sub-sector is becoming more important as reef fish decline and, in addition to tuna and tuna-like species, these fishers appear to seasonally target sharks which are valued locally for their cheaper meat. No specific shark species appear to be targeted, rather sharks in general are retained, and the scale of incidental capture is not well known as artisanal fishers retail all species caught.

Between 1992 and 2012, scalloped hammerhead sharks, *Sphyrna lewini* (now Critically Endangered) dominated the artisanal landings, followed by the blacktip shark (*Carcharhinus limbatus*), blacktip reef sharks (*Carcharhinus melanopterus*), tiger sharks (*Galeocerdo cuvier*) and whitetip reef sharks (*Triaenodon obesus*). Among the rays, the most common species in artisanal catches, during the same period, were the ocellated or whitespotted eagle rays (*Aetobatus ocellatus*), blue spotted whiptail rays (*Taeniura lymma*), *Mobula* spp., and white-spotted wedgefish (*Rhynchobatus djiddensis*).

### 3.5. Industrial and semi-industrial fisheries

Kenya has a vibrant industrial shrimp trawl fleet (between 4 and 20 trawlers licensed at any one time since 1970s) operating in the Malindi-Ungwana Bay on the north coast. After experiencing high turtle mortalities, the fishery was closed for some years (2006-2008) and now requires the use of Turtle Excluder Devices (TEDs) upon re-opening, which was aimed to reduce incidental catch of sharks. However, TED compliance is poor as reported by the on-board observers. Eighteen species of sharks and 30 species of rays have been recorded as bycatch of the prawn trawlers in the Malindi-Ungwana Bay. The composition of the species is described separately in the Shark Assessment Report for Kenya.

Kenya's offshore waters are heavily exploited by foreign longliners and purse seiners targeting tuna. It is estimated that only 20% of tuna vessels potentially operating in the EEZ are licensed, with the lack of adequate monitoring and surveillance capacity incentivizing illegal, unregulated and unreported (IUU) fishing by industrial vessels in Kenya's EEZ. Catches reported from the industrial longliners have consistently included

individuals from the Carcharhinidae (requiem sharks e.g. *Carcharhinus longimanus*) and thresher sharks (*Alopias* spp.), scalloped hammerhead shark (*Sphyrna lewini*), short fin mako shark (*Isurus oxyrinchus*), crocodile sharks (*Pseudocarcharias kamoharai*) and a large number of blue sharks (*Prionace glauca*).

## CHAPTER 4

### 4.0. THE NATIONAL PLAN OF ACTION FOR THE CONSERVATION AND MANAGEMENT OF SHARKS IN KENYA (NPOA-Sharks)

#### 4.1. Rationale and framework

The International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) was conceived by the FAO council as a response to concerns on the increasing global catches of sharks from the 1980's. It aimed to form a precautionary framework for managing fisheries effort on sharks in the absence of a global regulatory framework and given the sensitive life-history traits of sharks and poor scientific knowledge on shark stocks. The IPOA-Sharks is guided by the FAO Code-of-Conduct for Responsible Fisheries (CCRF) as envisaged by Article 2 (d) of the Code and was endorsed by the FAO council in June 1999 and adopted by the November 1999 FAO Conference. The IPOA-Sharks has an overarching goal of *“to ensure the conservation and management of sharks and their long-term sustainable use.”* To achieve this goal, the IPOA-Sharks recommended that member states of the FAO that conduct fisheries which either target sharks, or regularly take sharks as incidental catch, or countries in whose waters sharks are readily captured, should voluntarily develop a National Plan of Action for the Conservation and Management of Sharks and Rays (NPOA-Sharks) in their EEZs. Kenya has developed this NPOA-Sharks in response to this global appeal from the FAO and the IOTC, and as part of its international obligation to contribute to shark conservation.

Approximately 100 or so species of sharks and rays are estimated to occur in Kenya's EEZ (see 3.2). The fisheries resources in Kenya are managed by the State Department for Blue Economy and Fisheries (SDBE&F) through the Kenya Fisheries Service (KeFS). The Government of Kenya has developed a comprehensive fisheries management system for managing extractive fisheries and for protecting threatened and endangered marine species from the effects of fishing through the enactment of the Fisheries Management and Development Act, No. 35 of 2016. This law is applicable to shark

species as it is to other forms of aquatic resources exploited in Kenyan fisheries. However, the Act does not have specific measures and actions needed to focus on the unique conservation and management requirements of sharks. This NPOA-Sharks aims to bridge this gap.

#### **4.2. The Goals of the NPOA-Sharks**

The IPOA-Sharks (FAO 1999) sets forth 10 goals that a National Plan of Action for the Conservation and Management of Sharks should strive to achieve (see Annex 3). These goals have been adapted and shaped by the stakeholder inputs to form 7 goals for Kenya's NPOA-Sharks as follows:

**Goal 1:** Ensure that shark catches from directed and non-directed fisheries in Kenya are sustainable.

**Goal 2:** Identify and provide special conservation and management attention to vulnerable or threatened species of sharks and their habitats.

**Goal 3:** Minimize the incidental catch of sharks in the artisanal, prawn trawl, and longline tuna fisheries in Kenya.

**Goal 4:** Minimize waste and discards from shark catches, in accordance with Article VII.2.2(g) of the Code of Conduct for Responsible Fisheries (e.g. by requiring the retention of sharks from which fins are removed), and ensure full utilization of dead sharks.

**Goal 5:** Improve and develop frameworks for establishing and coordinating effective stakeholder education and awareness creation, consultation of stakeholders on research, conservation, management and educational initiatives within Kenya and internationally.

**Goal 6:** Facilitate improved species-specific catch and landings data collection and effective monitoring of shark catches, and collection of trade data.

**Goal 7:** Contribute to the protection of biodiversity and ecosystem structure and functioning through research, conservation, and management.

### **4.3. Development Process of NPOA-Sharks for Kenya**

In 2014, the State Department for the Blue Economy and Fisheries (SDBE&F) initiated the process of drafting a National Plan of Action for Sharks and Rays. A roadmap to complete the plan was developed comprising of three steps, namely; 1) Development of a Shark Assessment Report-SAR, 2) preparation of an Ecological Risk Assessment (ERA) of the species vulnerability to overfishing, and, 3) Drafting of the NPOA- Sharks, its adoption and implementation. In 2017, the SDF&BE in collaboration with the Wildlife Conservation Society (WCS) and contributing partners, started the process by preparing a baseline SAR. In 2022, the Kenya Marine Fisheries Socio-economic Development Project (KEMFSED) engaged a consultant to support the development of the NPOA sharks. The Sharks Technical Committee (STC), constituted in 2014 provided technical support and guidance during the development of the NPOA-Sharks for Kenya. The STC, through the leadership of a consultant, oversaw the revision and consolidation of the baseline SAR for Kenya together with the completion of the Ecological Risk Assessment for shark and ray species that occur in Kenya’s EEZ. Both the SAR and ERA reports formed key documents supporting the development of the NPOA-Sharks for Kenya.

A sharks fishery stakeholder validation workshop (see Annex 4) was then held in November 2022 to validate the SAR and ERA reports, to obtain stakeholder views and gauge attitudes towards sharks and their conservation, discuss and generate prioritized issues affecting sharks in Kenya, and suggested actions to address the issues in a timely fashion. A first draft (Draft 1) of NPOA-Sharks was then generated based on the issues originating from the stakeholder workshop. This Draft 1 of NPOA-sharks was reviewed by county government fisheries departments, fisheries management at National level, FAO representative, and other stakeholders during an online stakeholder consultation. A second stakeholder meeting was held in March 2023 to validate the Draft 1 NPOA-Sharks report and to receive additional inputs and concurrence of the stakeholders on the recommendations contained in Draft 1 of the action plan. Following the second stakeholder workshop, this final NPOA-Sharks was concluded for implementation.

## **Vision**

*Sharks in Kenya's EEZ, including territorial waters, are effectively conserved and managed for ecological services and for their long-term sustainable use for the benefit of all Kenyans.*

## **Mission**

- *To sustainably manage shark fisheries using an adaptive and precautionary approach that takes into account emerging scientific evidence and the socioeconomic well-being of the Kenyan citizens.*
- *To enhance capacity building in the areas of shark conservation and management.*

## **Scope**

The operational scope of the NPOA-Sharks for Kenya cover the following areas:

*(a). Geographical area:* The action plans covers fishing activities within the internal and territorial waters and the EEZ (Figure 3). The implementation of the plan will be by different agencies including: five coastal county government (Mombasa, Kilifi, Lamu, Tana River, and Kwale) departments with mandate to manage fisheries under the devolved functions, the fisher BMUs, the national government agencies, and conservation non-governmental organizations working with communities in the coastal areas of Kenya.

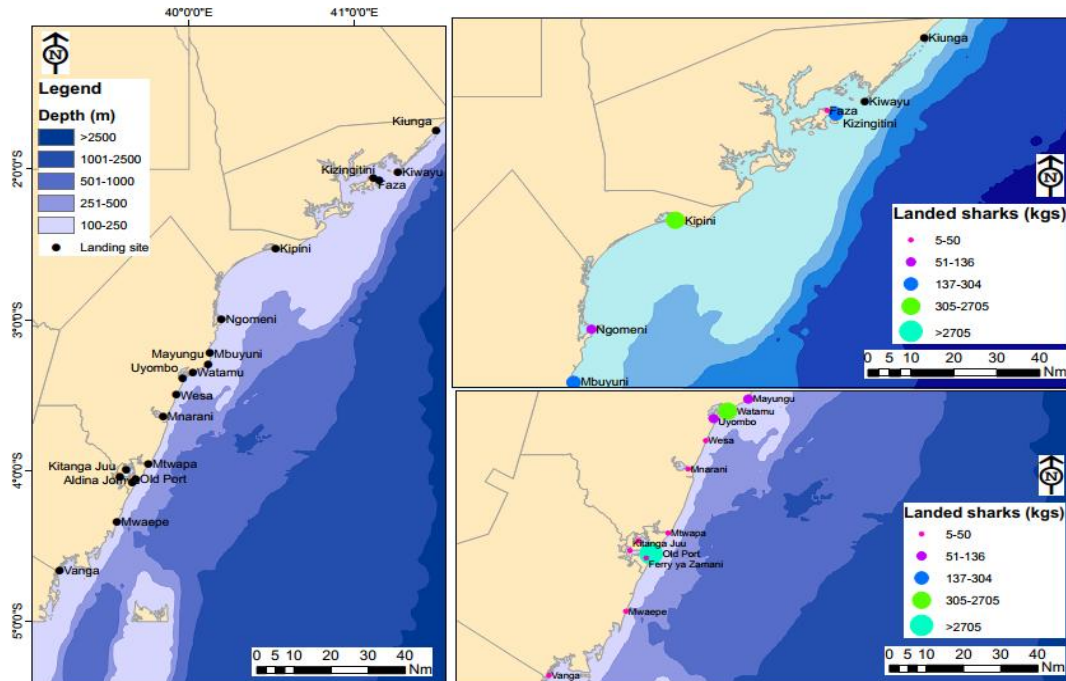


Figure 3: Distribution of shark landing sites on the Kenyan coast.

(b). *The species*

- (i) All cartilaginous fishes in the Class Chondrichthyes, which includes; sharks, skates, rays and chimaeras occurring within Kenya's EEZ.
- (ii) Coastal, pelagic and estuarine ecosystems that sharks are known to inhabit.

(c). *Fishing and trade operators*

- (i) All the artisanal gears operating in the coastal waters of Kenya and that catch sharks directly or indirectly.
- (ii) All the foreign and local commercial/industrial vessels fishing within Kenya's EEZ such as longliners, prawn trawlers, purse seiners and others, and that take sharks as targets or incidental catches.
- (iii) Recreational tourism and game fishing operators catching sharks and rays.
- v) All traders in live sharks such as the commercial aquaria.
- (v) All traders in shark fins, meat, cartilage or souvenirs and other products.

#### **4.4. Strategic Objectives of the NPOA-Sharks**

The *de facto* strategic objectives of the National Plan of Action for Sharks are adapted from those outlined in the Fisheries Management and Development Act, No. 35 of 2016. They are:

- i) To protect, manage, use and develop the chondrichthyan resources in a manner which is consistent with ecologically sustainable development.*
- ii) To enhance food security and livelihoods in a sustainable way.*
- iii) To meet conservation and management commitments that have been made to international partners by the government of Kenya.*

#### **4.5. Guiding Principles for NPOA-Sharks for Kenya**

The implementation of the strategic objectives in section 4.4. shall be guided by the following five principles adopted from the Fisheries Management and Development Act of 2016 (No. 35) and from the IPOA guidelines (FAO 1998) to suit the shark conservation and management in Kenya as:

- i. Ecosystem-Based Approach:* The plan will embrace the ecosystem-based approach to fisheries management principle in the conservation and management of sharks that embraces an all-inclusive approach to the management of resources.
- ii. Equity:* Encouraging equity between parties that utilize shark resources.
- iii. Sustainable stocks and Precautionary approach:* Management and conservation strategies will aim to keep total fishing mortality for each species within sustainable levels by applying the precautionary approach in the face of inadequate scientific evidence.
- iv. International Standards:* The development of shark fishery will proceed at no less standard than is set out in any international agreement to which Kenya is a party.

v. *Nutritional and socio-economic considerations.* Management and conservation objectives and strategies, within NPOA-Sharks, should recognize that shark catches are a traditional and important source of food, employment and/or income to coastal communities. Such catches should be managed on a sustainable basis to provide a continued source of livelihoods (food, employment and income) to local communities.

#### **4.6. Implementation and coordination of NPOA-Sharks**

Oversight of implementation, coordination, monitoring and evaluation of the NPOA-Sharks for Kenya will be undertaken by a *multi-stakeholder committee* that is constituted and chaired by the KeFS. The *Shark Plan Implementation Committee (SPIC)* will have the following terms of reference:

1. Oversee the implementation of the action plan and achievement of the outputs and outcomes as outlined in the implementation logical framework (Chapter 7).
2. Plan and draft a monitoring and evaluation program for the plan.
3. Undertake an annual review of the action plan in order to determine levels of success, gaps and challenges and in order to build into the final end-term review of the plan.
4. Coordinate funding by the government through development partners, stakeholder support, non-profit organizations, and other opportunities.
5. Prepare reports for reporting of the progress on implementation of the NPOA-Sharks to IOTC and FAO as part of Kenya's biennial reporting on the progress on implementation of the Code of Conduct for Responsible Fisheries to the FAO.
6. Initiate and coordinate research on the process of Non-detriment Findings (NDF) as may be required.
7. Perform any other tasks necessary for the success of the action plan in order to meet the plan's vision of sustainable conservation and management of sharks in Kenya.

#### **4.7. Duration and Review of the NPOA-Sharks**

The NPOA-Sharks shall last a period of four years (2023-2026) and its progress will be evaluated every year by SPIC and the results (challenges, gaps, opportunities and

developments) used to perform the final review of the plan at the expiry of the fourth year. A revised NPOA-Sharks will be implemented after the fourth year.

#### **4.8. Supporting Legal and Governance Frameworks for the Implementation of the NPOA-Sharks**

##### **4.8.1. National legal, institutional and policy frameworks**

Kenya has enacted a number of legislative measures relevant to managing and maintaining the long-term sustainability of aquatic (thereby including shark) populations. Kenya's approach to managing its fisheries and ocean resources is based on a constitutional (constitution of Kenya, 2010) commitment to ecological sustainability. In Part 2-Land and Environment, Article 69, the State is obligated to: *a) Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits; and b) Protect genetic resources and biological diversity (Constitution of Kenya 2010; Part 2-Land and Environment).*

Other relevant and specific legislative and policy instruments that can be invoked in the implementation of the NPOA-Sharks are presented in Table 1 below:

**Table 1: Relevant and specific legislative and policy instruments applicable for implementation of the NPOA-Sharks.**

<b>Legislative framework</b>	<b>Summary of legislative framework</b>
The Fisheries Management and Development Act (FMDA), 2016, No. 35.	Establishes KeFS with the sole responsibility for “the conservation, management and development of Kenya's fisheries resources in accordance with the Act”  Section 7; Empowers the Cabinet Secretary (CS) to make regulations setting out standards for the management of BMUs

	<p>that shall be established by the County Governments in order to ensure structured community participation in fisheries management.</p> <p>Section 37; Empowers the CS to declare any species of fish to be endangered or threatened with extinction and, to the extent possible, include those species relevant to Kenya that have been declared endangered or threatened under any international agreement or instrument to which Kenya is party (Section 45). Provides for the development of Fisheries Management Plans (Section 39). Imposition of Fisheries Management Measures including gear restrictions and control of harvesting (Section 40), and the declaration of a fishery area to be a Marine Protected Area (Section 47). Section 84 provides for licensing, authorization and registration of all fisheries related activities among many other management actions.</p>
Wildlife Conservation and Management Act, 2013	<p>Implemented by the Kenya Wildlife Service (KWS) in collaboration with relevant agencies. Empowers the CS, on the advice of KWS and in consultation with the National Land Commission, by notice in the Gazette, to publish a national list of wildlife ecosystems and habitats that are endangered and threatened and are in need of protection. The Act also empowers the KWS to declare and list any species as nationally critically endangered, vulnerable, nearly threatened and protected.</p> <p>Under this Act, the following sharks, rays and skates are declared vulnerable: Grey nurse shark (<i>Carcharias taurus</i>), Whale shark (<i>Rhincodon typus</i>), Porcupine ray (<i>Urogymnus asperrimus</i>), Oceanic whitetip shark (<i>Carcharhinus longimanus</i>), Great white</p>

	shark ( <i>Carcharodon carcharias</i> ), Bowmouth guitarfish ( <i>Rhina ancylostoma</i> ), Black-blotched stingray ( <i>Taeniura meyeni</i> , now <i>Taeniurops meyeni</i> ), Giant guitarfish ( <i>Rhynchobatus djiddensis</i> ), Shorttail nurse shark ( <i>Pseudoginglymostoma brevicaudatum</i> ).
The Kenya Fisheries Policy, 2022.	<p>The overall goal of the Kenya Fisheries Policy (2022) is to guide the sector to achieve sustainable management and development of fisheries and aquaculture. The policy has the following policy objectives applicable to the conservation of sharks and other marine resources:</p> <p>i). To sustainably maximize utilization of the fisheries and aquaculture resources for socio- economic development; ii). To strengthen MCS for sustainable management of the fisheries resources; iii). To promote demand driven, adaptive research and innovation for sustainable fisheries; iv). To enhance fish quality and safety, fish product utilization, value addition, and marketing; v). To strengthen and harmonize regional, continental, and international cooperation in fisheries and aquaculture governance; vi). To develop an efficient and effective human resource for conservation, management and development of fisheries and aquaculture; vii). To provide timely and accurate data collection, information sharing and storage; To promote a sustainable management among transboundary fisheries resources users.</p>
The Environmental Management and Coordination Act	<p>Section 55 of EMCA provides for an inventory of areas within the coastal zone of special value to fisheries other similar resources.</p> <p><i>The Minister shall, in consultation with the relevant lead</i></p>

(EMCA), 1999; Amended 2015	<p><i>agencies, issue appropriate regulations to prevent, reduce and control pollution or other form of environmental damage in the coastal zone. The regulations shall provide for the control and prevention of pollution – (a) of the marine environment from land based sources including rivers, estuaries, pipelines and outfall structures; (b) from vessels, aircrafts and other engines used in the coastal zone; (c) from installations and devices used in the exploration or exploitation of the natural resources of the seabed and subsoil of the exclusive economic zone; and (d) of the marine environment arising from or in connection with seabed activities and from artificial islands installations and other structures in the exclusive economic zone.</i></p> <p>Section 72 states that it is an offense to release or cause to be released into the coastal zone any polluting or hazardous substances.</p> <p>Section 93 provides measures to regulate discharge of any hazardous substance, chemical, oil or mixture containing oil into any waters or any other segments of the environment contrary to the provisions of this Act or any regulations thereunder.</p>
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#### **4.8.2. International and Regional Frameworks and Commitments by Kenya relevant to NPOA-Sharks**

In Kenya's policy documents, legal frameworks and statements, the Government recognizes that sustainability of the fisheries resources is a national, regional, as well as an international challenge. To help ensure the conservation and sustainable use of sharks and other fisheries resources in national and international waters, Kenya participates in several regional and international organizations and bodies concerned

with fisheries management. The KeFS closely monitors the fishing activities of both national and foreign-flagged vessels licensed to fish in internal, territorial waters and in the EEZ.

Kenya has also ratified and/or implemented several regional and international agreements and conventions that are; *inter alia*, key in the conservation and management of shark species. These agreements are recognized in the Fisheries Development and Management Act of 2016, and include:

- The 1982 United Nations Convention on the Law of the Sea;
- The 1995 United Nations Fish Stocks Agreement;
- The 1996 Indian Ocean Tuna Commission Agreement;
- The 1992 Convention on Biological Diversity;
- The 1975 Convention on International Trade in Endangered Species of Wild Fauna and Flora;
- The 1979 Convention on Migratory Species (CMS), CMS-Sharks MOU
- The 1995 FAO Code of Conduct for Responsible Fisheries (an FAO voluntary Code).
- The 2009 FAO Port State Measures Agreement (PSMA)
- The 2015 UN Sustainable Development Goals
- The Nairobi Convention and Its Protocols

#### **4.8.3. Institutional and Administrative Management Framework to support the Plan**

Several institutions in Kenya are directly involved in actions pertaining to the management, research and conservation of sharks that will be useful in the implementation of the plan (Table 6).

**Table 6: Institutions and their roles towards management of sharks**

Institution	Role	Enabling framework
Kenya Fisheries Service (KeFS)	<ol style="list-style-type: none"> <li>1. Ensuring the appropriate conservation and development of standards on management, sustainable use, development and protection of the fisheries resources;</li> <li>2. Collection and analysis of data in relation to fisheries resources and activities to help establish the status of shark stocks alongside other fisheries.</li> <li>3. Liaising as appropriate with agencies and persons, including stakeholders, industry, government agencies, regional and international organizations and experts, whether local or foreign, on matters fisheries;</li> <li>4. Administration and co-ordination of international protocols, conventions and treaties regarding fisheries in all its aspects; implementation of Port State Measure Agreement against IUU fishing.</li> <li>5. Coordination and/ or undertaking of monitoring, control and surveillance of all activities within the scope of</li> </ol>	<ol style="list-style-type: none"> <li>1. Fisheries Management and Development Act, No. 35 of 2016</li> </ol> <p>Gazette notice No 3409, 3411,3413, resolution 17/05 on the conservation of sharks caught in association with Tuna fisheries in IOTC area.</p>

	fisheries.	
Kenya Marine and Fisheries Research Institute (KMFRI)	Marine fisheries research especially that which can be used to establish the status of shark stocks and to support the TAC setting process to ensure catch limits are set at sustainable levels.	<ol style="list-style-type: none"> <li>1. Science, Technology and Innovation Act No. 28 of 2013;</li> <li>2. Fisheries Management and Development Act, No. 35 of 2016;</li> </ol>
Kenya Wildlife Service (KWS)	Establishment and protection of Marine Parks and Reserves, implementation of CITES and CMS resolutions, protection and conservation of sharks and rays identified under the Act as vulnerable, threatened or endangered.	Wildlife Conservation and Management Act, No. 47 of 2013.
Wildlife Research and Training Institute (WRTI)	<ol style="list-style-type: none"> <li>1. Generate knowledge on the status of the country's wildlife and their potential to facilitate optimized benefits from the wildlife resources;</li> <li>2. Capacity development through training to enhance wildlife conservation and management;</li> <li>3. Provide quality and comprehensive wildlife data and information to inform policy formulation.</li> </ol>	The National Wildlife Policy 2020
County Governments	1. Enforcement of fisheries regulations and compliance with management measures;	1. Fisheries Management and Development Act, No. 35 of 2016;

	<p>Will play a key role in controlling trade in shark fins, meat and by-products as fish trade is a devolved function.</p> <ol style="list-style-type: none"> <li>2. Implementation of fisheries policy, fisheries management measures and regulation and limiting access to fishing, gear and size restrictions.</li> <li>3. Fisheries monitoring, control and surveillance.</li> </ol>	<ol style="list-style-type: none"> <li>2. Maritime Zones Act, Cap. 371 of 1989.</li> <li>3. County Governments Act No. 17 of 2012 as read with the Special Issue Legal Notice No. 137 of 2013 on The Constitution of Kenya- The transition to Devolved Governments Act, 2012.</li> </ol>
National Environmental Management Authority (NEMA)	Coordination of environmental and biodiversity conservation, and protection of the marine environment from land-based human impacts.	The Environmental Management and Co-ordination No. 8 of 1999, and as Amended (EMCA-Amendments No. 5 of 2015).
Beach Management Units	<ol style="list-style-type: none"> <li>1. Strengthening the management of fish-landing stations, fisheries resources and the aquatic environment;</li> <li>2. Fisheries co-management to ensure sustainable harvesting of fisheries resources including sharks and rays</li> <li>3. Ensuring the achievement of high quality standards with regard to fish and fish products.</li> <li>4. Enforcement of laws and regulations pertaining to gear and size restrictions</li> </ol>	The Fisheries (Beach Management Unit) Regulations, 2007.
Kenya Maritime Authority	1. Enforce safety of shipping,	1. Kenya Maritime Act

(KMA)	<ul style="list-style-type: none"> <li>including fishing vessels;</li> <li>2. Coordinate Search and Rescue efforts;</li> <li>3. Develop, co-ordinate and manage a national oil spill contingency plan.</li> </ul>	<ul style="list-style-type: none"> <li>2006, (KMA Act);</li> <li>2. Merchant Shipping Act, 2009.</li> </ul>
Kenya Ports Authority (KPA)	Maintain, operate, improve and regulate sea ports.	Kenya Ports Authority Act No. 18 of 2014.
Universities	<ul style="list-style-type: none"> <li>1. Act as repositories of fisheries knowledge;</li> <li>2. Generate, impart, transfer and disseminate knowledge on fisheries.</li> </ul>	The Universities Act No. 42 of 2012
CBOs	<ul style="list-style-type: none"> <li>1. Participate in improving the livelihoods of fishing communities.</li> <li>2. Influence government policy and decisions in support of local fishing community development ideas and initiatives and sustainable fisheries.</li> </ul>	Various/ Sector wise cross-cutting
Non-Governmental Organizations (NGO's) such as WCS, WWF, CORDIO, Foundations,	<ul style="list-style-type: none"> <li>1. Participate in funding, research, management and conservation actions. E.g. Surveys, community capacity building</li> <li>2. Participate in improving the livelihoods of fishing communities.</li> <li>3. Influence/advocate for local, regional and global government policy and decisions in support of local fishing community</li> </ul>	Various/ Sector wise cross-cutting

	sustainable development and sustainable fisheries initiatives.	
Industry	<p>1. Provide opportunities for improved income from shark and ray fisheries through provision of markets, value addition and employment opportunities.</p> <p>2. Provide data on sharks and rays.</p>	Various/ Sector wise cross-cutting
Private institutions – Sport fishing clubs and Associations/ Aquaria Companies	Provide catch, trade, biological and other data on sharks and rays.	Various/ Sector wise cross-cutting

#### 4.8.4. Fisheries Enforcement and Compliance Strategies complementing the Plan

Kenya implements the management and compliance activities in her fisheries through the following strategies:

- Fisheries Management Plans;
- Research and Monitoring:
  - Monitoring Programs (Inspections)
  - Observer programs
  - Fisher/ data collection reporting
- Compliance with international instruments such as:
  - CITES
  - IUCN Red List

- PSMA

A brief description of some of these strategies is provided below.

#### **4.8.4.1. Fisheries Management Plans**

Integrated Fisheries Management Plans (FMPs) are developed by KeFS as per the provisions of the FMDA 2016, to identify goals and measures relating to conservation, management, and research needs for a particular fishery. To date, the completed FMPs include:

- a) The tuna management and development strategy;
- b) The small and medium pelagic fisheries strategy;
- c) The Aquarium fishery management plan;
- d) The Prawn fishery management plan;
- e) The Lobster fishery management plan;

The NPOA-Sharks for managing the shark stocks represents the 6<sup>th</sup> fisheries management framework developed by KeFS and will complement the other FMPs and the National Blue Economy Strategy when implemented.

The Fisheries Management and Development Act of 2016 *imposes a total ban on shark finning (the practice of removing shark fins and discarding the remainder of the carcass while at sea and requiring sharks to be landed with fins attached to the body)* within Kenya's EEZ. This ban is emphasised within the NPOA-Sharks. Moreover, the trade and sale of fins must be in appropriate proportion to the quantity of carcasses landed (5% of dressed carcass weight is usually recommended in the Western Indian Ocean region by the IOTC).

#### **4.8.4.2. Compliance with International Instruments**

Kenya has signed the 1995 UNFSA (United Nations Fish Stock Agreement). *One of the most innovative aspects of UNFSA is the right of Coastal States to board and inspect vessels of other state parties in order to verify compliance with internationally agreed fishing rules of RFMOs.*

Kenya is also a member of the Indian Ocean Tuna Commission (IOTC) which has already taken an adaptive position on shark management that supports the principles and practices of the IPOA-Sharks. The IOTC encourages the complete reporting of all shark catches, the full utilization of shark carcasses (including restrictions on finning), and the reduction and release of shark bycatch. Every year during the IOTC Working Party on Ecosystems and Bycatch (WPEB) and the Scientific Commission (SC), Kenya reports on the progress made towards the development of the NPOA-Sharks.

*The IOTC has also totally banned the capture and retention of the 3 species of thresher sharks (Alopiidae) and the oceanic white tip shark. The Kenya Gazette Vol. CXXII—No. 83 Gazette notice 3409-3413) measures that Kenya will implement as part of the actions to implement the NPOA-Sharks. The banned sharks include:*

- 1. Common thresher (Alopias vulpinus)*
- 2. Bigeye thresher (Alopias superciliosus)*
- 3. Pelagic thresher (Alopias pelagicus)*
- 4. Oceanic whitetip shark (Carcharhinus longimanus)*
- 5. Manta rays and mobula (devil) rays (family Mobulidae)*

In addition to the measures outlined above, the IOTC has further adopted a number of programs that support the study of stock status and bycatch levels for all sharks within its area of competence and the collection and assessment of data on specific species including blue and mako sharks. IOTC has also a ban on setting of purse seine nets

when a whale shark (*Rhincodon typus*) has been observed which may be applicable to foreign vessels operating in Kenya's EEZ.

## CHAPTER 5

### 5.0. THE ISSUES AND CHALLENGES RELEVANT TO THE CONSERVATION AND MANAGEMENT OF SHARKS IN KENYA

The following 12 issues and challenges were identified during a consultative multi-stakeholder workshop, as requiring conservation and management actions within the framework of the NPOA-Sharks in order to meet the Vision and Mission of the plan:

**Issue 1: Limited protection of the threatened (endangered, vulnerable, and critically endangered) species of sharks (e.g. hammerheads, guitarfishes, wedgefishes, manta and devil rays and those listed in the sixth schedule of the Kenya Wildlife Act, 2013):** There are no controls on harvesting of sharks that are considered threatened with extinction globally and that interact with different fishing gears in Kenya's EEZ. The Shark Assessment Report already lists a number of species that are highly vulnerable to overexploitation amongst which are the species that are categorized as being threatened with extinction by the IUCN Red List Assessment. Risk-based management requires that a more precautionary approach is taken to manage these species including enactment of the relevant restrictive laws and change of fishing behaviour. Additional actions will require more surveillance and application of the international laws and instruments (e.g. CITES, CMS, CMS-Sharks MOU, IOTC) protecting different species as listed in their appendices including the IOTC and CMS protected species and those listed as vulnerable (nine species) in the sixth schedule of the Kenya Wildlife Act (section 4.8.4.2).

**Issue 2: Lack of a fishery-specific Management Plan for Sharks and Rays:** The Kenya Fisheries Service (KeFS) is mandated to manage all fisheries resources in Kenya under the Kenya Fisheries Management and Development Act of 2016. This law has provisions that could be applied to manage sharks (see Table 1). The current marine fisheries management regulations are restricted to licensing, gear restrictions and seasonal/area closures for the prawn trawl fishery. However, given the life-history

traits of shark species that differ from those of pelagic species like tunas and other teleosts, there is need for a focused management plan for sharks that is more innovative and adaptive, and suited to the life-histories and ecologies of sharks. Such a management plan would coordinate management across different fisheries, protect critical habitats (spawning, nursery, migratory areas), protect the threatened species and progressively apply scientific principles and tools (e.g. stock assessment) to determine catch limits. There may be a need for more transboundary cooperation to manage pelagic sharks (mako sharks, blue sharks, silky sharks, oceanic white tip sharks, among others), which would also align with and improve adherence to the binding and voluntary measures imposed under CMS and the CMS Sharks-MOU and the IOTC. There is a need for continuous evaluation of the threats to sharks through rapid risk assessment methods for risk-based management of sharks within a Shark's Management Plan.

**Issue 3: Unregulated shark bycatch in the industrial trawl and longline tuna fisheries:** The commercial fisheries taking sharks as bycatch include the prawn trawlers in the Malindi-Ungwana Bay, the only trawlable ground in Kenya, and the longliners targeting tunas and tuna-like species. There is a lack of effective mitigation of the shark bycatch volumes through BRDs, uncertainty on survival of discarded species, lack of guidelines for safe handling and release of live sharks to sea, lack of data on hook-sizes and numbers deployed, no regulations on branchline leaders or trace for longline vessels that target tuna and tuna-like species. There is lack of consistent and effective surveillance on the requirement to have de-hookers or line cutters aboard tuna longline vessels as per the Kenya Gazette Notice Vol CXXII, No 83 of 2020. However, this notice was specific to turtle bycatch and needs to be customized to shark bycatch. Conflict between trawlers and local fishers and lack of knowledge on effects of bycatch on threatened species hamper conservation efforts on shark stocks.

**Issue 4: Declining shark landings and sustainability of the catches:** Shark Landings have declined by about 84% in the long run (1978-2020) and by 60% in the

recent times (2016-2020). The declining catches in the absence of drastic changes in fishing effort may be indicative of changes in species abundance. It is not known how the threatened species have been affected by the declining catches since landing records are not made to taxonomic levels. It is important to ensure that shark landings are sustainable and that catches are maintained at levels consistent with sustainable yields (e.g. biomass at maximum sustainable yield-BMSY).

**Issue 5: Limited capacity for species identification:** During the multi-stakeholder consultations, shark identification (ID) to any taxonomic level was listed as one of the priority issues hampering the conservation and management of sharks. Shark ID is important for monitoring trade and for stock assessment. Currently, the catches are lumped as “sharks and rays” in the records making it difficult to use the data to monitor population trends or assess status of species. There is a lack of skills and knowledge in shark identification among the fishers, enumerators, researchers, traders and other stakeholders. The trainings on species identification have been opportunistic, disjointed and targeted at restricted groups. Kenya has now banned shark finning (removal of fins with discarding of the carcass at sea) through the Fisheries Management and Development Act of 2016; this action should allow the landing of finned sharks and easy identification of species.

**Issue 6: Capacity for data collection, reporting and archiving:** Shark landings data are primarily collected by the KeFS for national statistics. Other entities collecting shark data include the national research institute (KMFRI), NGOs, universities, and customs department for trade data. There is no standardized format for collecting data, and a lack of a framework for reporting and sharing of data amongst the stakeholders. There should be adequate monitoring of all sectors interacting with sharks such as artisanal, commercial and recreational fishers for the purposes of data collection. There is a need for capacity building for collection of different types of data (landings, morphometrics, age and growth, life-history) on sharks and their application for conservation and management.

**Issue 7: There is poor public awareness and education on sharks:** The general population have a negative perception of sharks based mostly on international media reports on shark attacks on people in other countries, thereby hampering conservation efforts requiring public support and positive attitudes. Additionally, there is poor knowledge or awareness of the shark species in Kenyan waters, the ecological roles of sharks and species conservation status, and potential role of sharks in enhancing livelihoods through value addition and trade. These gaps call for education and awareness creation on sharks among stakeholders and citizens to impart knowledge on species status, need for safe returns to sea of threatened species and juveniles. More informed citizens are likely to be supportive of conservation efforts.

**Issue 8: Few dedicated research initiatives on sharks:** The paucity of focused research on sharks has made it difficult to apply evidence-based management approaches on shark stocks. Precautionary approaches to conservation are therefore preferable in the absence of scientific-evidence. There is need for more research on: life-history strategies and species biology, stock assessments, fishing effects on populations, critical habitat (feeding, pupping, nursery) mappings, continuous risk assessments, taxonomic applications, population structure, bycatch reduction, species movement patterns, genetic structure and connectivity, amongst others. The current research initiatives are uncoordinated and seem to serve narrow personal or institutional interests. There is need for a comprehensive database on existing research initiatives and how they can be applied for conservation and management purposes.

**Issue 9: Wastage and poor utilization of whole shark carcass:** There is a general lack of information on the range of products and value addition applicable to shark carcasses for food, trade, and other livelihood support systems. Shark meat is not a choice food for most of the communities in Kenya, whereas only a few traders are formally involved in the shark fin trade or trade in other products. The formal markets for shark products are not well established locally or internationally, and the shark products value chain is neither well understood nor well documented. More marketing, value

addition and trade framework will be required for shark species whose stocks are sustainable and not categorized as being vulnerable to local overfishing following the ERA analysis.

**Issue 10: Weak Monitoring, Control and Surveillance (MCS) infrastructure and capacity:** The KeFS is not optimally equipped to monitor the shark catches at sea and landings along the 640 km coastline due to constraints on the MCS resources and limited species identification skills. This weakness compromises conservation efforts as relates to shark species requiring protection, finning ban enforcement, monitoring shark bycatch through BRDs, and monitoring on-dock activities on local and foreign fishing vessels. There is need for an improved monitoring and reporting mechanism on trade in shark products such as fins and meat in Kenya.

**Issue 11: Limited alternative livelihoods for fishers:** The artisanal fishers have limited alternative livelihoods to fishing. This situation threatens the survival of sharks through Malthusian overfishing driven by poverty levels, year-round fishing including fishing on critical habitats (e.g. nursery grounds), retention of all species caught including the threatened species and use of illegal and unregulated fishing activities. There is need for innovative and adaptive livelihood options with potential to deflect fishing pressure on sharks. Knowledge on critical habitats such as nursery grounds, and areas of high diversity and abundance of threatened species, along with carefully designed management measures, can ensure that conservation efforts are focused to have the greatest benefit to the sharks, but the least impact to the fishers through access to alternative livelihoods.

**Issue 12: Poor understanding of effects of fishing on assemblage structure, ecosystem function and biodiversity loss:** Fishing removes sharks as top-predators in the ecosystem. How this affects biodiversity and ecosystem functioning is not well documented. There is evidence that the composition of shark bycatch in the Malindi-Ungwana Bay has changed over time due to trawling (see the Kenya SAR), however,

little is known on the large-scale effects of the different gears on sharks and how this has affected ecosystem function and structure.

## CHAPTER 6

### 6.0. ACTIONS NECESSARY TO MITIGATE IDENTIFIED ISSUES AND CHALLENGES FOR CONSERVATION AND MANAGEMENT OF SHARKS IN KENYA

The seven goals of the NPOA-Sharks for Kenya have been aligned and adapted from those recommended by the IPOA-Sharks (see section 4.2 and Annex 3) to serve as guidelines for national plan of actions for the conservation and management of sharks. Under each of the seven goals, objectives are nested that spring from the issues identified by the stakeholders (see chapter 5) as affecting the conservation and management of sharks in Kenya and requiring action. To each of the objectives, a number of actions, based on stakeholder recommendations, have been proposed and their implementation prioritized (as: High, Medium and Low) to meet the objectives of the plan. Time-frames are provided within which to execute the actions and meet the objectives, and responsible entities to contribute to the actions or oversee their implementation are listed. *Overall, a total of the 7 goals with 14 objectives address the conservation and management needs of sharks in Kenya's EEZ.*

*This NPOA-Sharks only addresses the threats caused by fishing and trade effects and does not deal with the non-fishing threats to sharks.*

Some of the actions are common to more than one goal and objective, underscoring their importance in the conservation of sharks. Actions are prioritized depending on the desired period of completion as: **High (during 2023)**, **Medium (2024-2025)**, **Low (2025-2026)**. The time-frames have been provided to help monitor and evaluate the effectiveness of the plan. However, certain high priority actions may span long periods, while some low priority actions may require immediate implementation.

The goals, objectives and actions to be implemented within the NPOA-Sharks are described below:

### Goal 1: Ensure that shark catches from directed and non-directed fisheries in Kenya are sustainable

**Purpose:** This goal serves to address the observed decline in shark catches over the years indicative of the effects of fishing and likely reduction in shark abundance in the wild. The long-term changes in catches of the trawl and longline fisheries are not known but there is evidence of changes in assemblage structure of prawn trawl shark bycatch in the Malindi-Ungwana Bay towards meso-predatory sharks. Additionally, the majority of the shark bycatch in trawlers and artisanal fisheries are juveniles, leading to possibility of growth overfishing of the stocks. No fisheries conservation and management measures are in place for any of the hammerhead sharks which are listed in Appendix II of CITES and that are substantially harvested as juveniles in Malindi-Ungwana Bay, or any other sharks and rays, whether in Appendix I or II of the CITES or not. Some of the restrictive regulations are already prescribed in the Wildlife Conservation and Management Act, 2013, and are enforceable by the KWS (see Table 1 and 2). The need for sustainability of catches will be addressed in this NPOA-Sharks as per the objectives and actions in the Table below:

Objectives	Actions	Priority*	Agency
<b>1. Manage shark catches sustainably for ecosystem function, species sustainability and livelihoods.</b>	<ul style="list-style-type: none"> <li>Implement NPOA Sharks through formation of <i>National Shark Plan Implementation Committee (SPIC)</i>.</li> </ul>	High	KeFS, NGOs, KWS, SDBE&F, KCGS, CGs, BMU Network
	<ul style="list-style-type: none"> <li>Register and License all fishing vessels and gears operating in Kenya's Fishery Waters.</li> </ul>	High	KeFS, KMFRI, NGOs

<p><b>2. Develop regulations to protect threatened species and to domesticate international agreements and conventions</b></p>	<ul style="list-style-type: none"> <li>• Map and protect shark critical habitats.</li> <li>• Conduct and review risk assessments for all shark species.</li> <li>• Conduct stock assessment and determination of fisheries reference points.</li> <li>• Designate a Sharks Fisheries Officer to oversee enforcement of NPOA-Sharks.</li> <li>• Liaise with the relevant leaders, lawmakers, stakeholders to start the process of restricting fishing and/or trading in sharks listed in CITES, CMS, IOTC Appendices, Nairobi Convention annexes and those threatened as per IUCN Red List.</li> <li>• Review and update CITES non-detriment findings whenever necessary.</li> </ul>	<p>High</p> <p>Medium</p> <p>Low</p> <p>Low</p> <p>Medium</p> <p>Low</p>	<p>KeFS, CGs, KCGS, BMU Networks, KWS and Co-Management Plan.</p> <p>KeFS, KMFRI NGOs, BMU, vessel agents.</p> <p>KeFS</p> <p>KeFS, SDBE&amp;F</p> <p>KeFS, KWS, WRTI, SDBE&amp;F, BMU Networks</p> <p>KeFS, KWS, WRTI</p>
<p><b>3. Promote alternative livelihoods for</b></p>	<ul style="list-style-type: none"> <li>• Build capacity and empower fishers in</li> </ul>		

<b>artisanal fishers to allow for area/seasonal protection, species bans and catch restrictions.</b>	shark-based tourism/recreational activities (e.g. dive site identification, aggregation site locations, Manta cleaning site locations, Whale shark tourism, reef shark aggregation areas, etc).	Medium	KeFS, County governments, BMUs.
	<ul style="list-style-type: none"> <li>Support establishments of BMUs, CMAs measures for shark conservation and recreational activities</li> </ul>	Low	County governments, KeFS, NGOs

\*Priority ratings: High (2023); Medium (2024-2025), Low (2025-2026)

## Goal 2: Identify and provide special conservation and management attention to vulnerable or threatened species of sharks and their habitats.

**Purpose:** This goal serves to avoid local extinction of highly vulnerable shark species due to the threat of overfishing. Fifty-six percent (56%) of sharks and 60% of rays are threatened with extinction among the stocks on the Kenyan coast as per the Shark Assessment Report. Conservation of the threatened species of sharks and their habitats is necessary to maintain biodiversity and provision of ecosystem services and goods.

Objectives	Actions	Priority*	Agency
<b>4. Protect the vulnerable and threatened species from localized</b>	<ul style="list-style-type: none"> <li>Impose bans or catch restrictions on the highly vulnerable and the endangered species as per the ERA</li> </ul>	Medium	KeFS, KCGs, County Governments

<p><b>extinctions due to direct or indirect fishing pressure or habitat destruction.</b></p>	<p>report.</p>		
	<ul style="list-style-type: none"> <li>• Enact regulations protecting threatened species listed in various conventions and instruments such as CITES, IOTC and CMS and those prioritized in the ERA report.</li> </ul>	High	SDBEF, KWS, WRTI, KCGs, SDBE&F
	<ul style="list-style-type: none"> <li>• Develop protocols or guidelines for handling and safe return to sea of live specimens of threatened species.</li> </ul>	High	KeFS, KMFRI, BMUs
	<ul style="list-style-type: none"> <li>• Enter into MoUs or agreements with fishers on stock enhancement and restrictions on threatened species.</li> </ul>	High	KeFS, SDBE&F, KWS, Industries, BMUs
	<ul style="list-style-type: none"> <li>• Adopt sustainable gear technologies that help reduce shark bycatch.</li> </ul>	High	KeFs, KMFRI, NGOs, Fisher BMUs, KCGs
	<ul style="list-style-type: none"> <li>• Demarcate shark critical habitats and patrol for protection compliance.</li> </ul>	Medium	KeFS, KMFRI, KWRI, NGOs, BMUs

**Goal 3: Minimize the incidental catch of sharks in the artisanal, prawn trawl, and longline tuna fisheries.**

**Purpose:** This goal aims to conserve the biodiversity of sharks and maintain ecosystem functioning by maintaining stocks at viable levels. Incidental catches are taken by fisheries targeting other pelagic species such as tunas in longlines or prawns by the trawlers. However, the productivity and catch rates of the sharks will continue to decline as a result of bycatch even if the target stocks remain viable. Sharks have sensitive life-history traits that make them highly vulnerable to overfishing with slow recovery or an inability to recover, once they are overfished beyond the biomass at maximum sustainable yield (BMSY). There is therefore a need to minimize the bycatch of sharks and to maintain fishing mortality (F/year) below that required to sustain stocks ( $F < F_{MSY}$ ). In situations where the management reference points are difficult to estimate as in Kenya's fisheries due to data deficiencies, the precautionary approach to conservation and management is a desirable risk-based approach. Objectives, actions and responsibilities for this goal are shown in the Table below:

Objectives	Actions	Priority*	Agency
<b>5. Minimize incidental catches of sharks by the prawn trawlers in Malindi-Ungwana Bay.</b>	<ul style="list-style-type: none"> <li>Enforce use of bycatch reduction devices (BRDs) such as TED and ensure vessels have CCTVs installed for surveillance.</li> </ul>	High	KeFs, KCGs
	<ul style="list-style-type: none"> <li>Create awareness and sensitize fishers on safe handling of live sharks on-board and return to sea.</li> </ul>	High	KeFS, NGOs, county governments
	<ul style="list-style-type: none"> <li>Investigate on the post-release mortality rates of shark species to inform release strategies.</li> </ul>	Low	KeFS, KMFR, NGOs
	<ul style="list-style-type: none"> <li>Maintain a vessel log book and record sharks caught dead,</li> </ul>	High	KeFS, KCGs, vessel owners

<p><b>6. Minimize incidental catches of sharks by the tuna longline fishery.</b></p>	<p>live and those returned to sea.</p> <ul style="list-style-type: none"> <li>• Mapping and zoning of areas of critical habitats of sharks within the bay for trawling area mgt.</li> <li>• Enforce finning ban on sharks as per the FDMA 2016 and Gazette notice Vol CXXII, No. 83of 2020, by providing guidelines on shark handling and processing on board vessels.</li> <li>• Enforce regulations on use of de-hookers and line cutters on-board longline vessels specifically for shark bycatch.</li> <li>• Ban the use of wire traces and instead introduce plastic leaders on the branchlines.</li> <li>• Conduct gear selectivity studies and regulate on appropriate hook shapes, numbers, and sizes to be used.</li> </ul>	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Low</p>	<p>KMFRI, KeFS, county governments, BMU, Vessel agents.</p> <p>KeFS, KCGs</p> <p>KeFS, KCGs, SDBE&amp;F,</p> <p>KeFS, KCGs</p> <p>KeFS, KMFRI</p>
<p><b>7. Reduce incidental catches of sharks by artisanal fishers.</b></p>	<ul style="list-style-type: none"> <li>• Develop guidelines on safe handling and return of live sharks to sea.</li> </ul>	<p>High</p> <p>High</p>	<p>KeFS, KMFRI, NGOs, county governments.</p> <p>KeFS, KCGs,</p>

	<ul style="list-style-type: none"> <li>• Introduce simple logbook to capture incidental catch of sharks including caught dead and retained or discarded per fishing trip.</li> <li>• Implement guidelines on return to sea of live specimens of listed threatened shark species, protected shark species and CMS- and IOTC-listed sharks.</li> <li>• Build capacity and awareness towards behaviour change to return immature sharks based on sizes to sea by artisanal fishers.</li> <li>• Strengthen co-management to identify and protect areas of feeding, nursery, pupping or aggregation by the sharks and to avoid the areas.</li> <li>• enforce mesh size limit, illegal gears ban and monitor illegal Unreported and Unregulated (IUU) fishing activities.</li> <li>• Create awareness to dealers of fishing gears on their impact on the marine resources.</li> </ul>	<p>High</p> <p>High</p> <p>Low</p> <p>Medium</p> <p>High</p>	<p>SDBE&amp;F</p> <p>KeFS, county governments.</p> <p>County governments, KeFS, Civil society organization,</p> <p>KeFS, NGOs</p> <p>KeFs, KCGs</p> <p>KeFS, KCGS, County Governments, SDBE&amp;F</p>
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**Goal 4: Minimize waste and discards from shark catches, in accordance with Article VII.2.2(g) of the Code of Conduct for Responsible Fisheries (e.g. by requiring the retention of sharks from which fins are removed), and ensure full utilization of dead sharks.**

**Purpose:** Article 7.2.2. (g) of the FAO's Code of Conduct for Responsible Fisheries (CCRF) requires that: "wastes, discards, catch of non-target species for both fish and non-fish species, and impacts on associated or dependent species are minimized". Kenya has now banned shark finning, a wasteful process by which the fins are removed and the carcass thrown away at sea while shark is alive or dead. This action is against animal welfare, is wasteful and leads into inaccurate catch records. There is high demand for protein food among Kenyan communities to overcome malnutrition, in addition to other socio-economic requirements. These needs call for minimizing wastes from unutilized shark carcass or discards at sea.

Objectives	Actions	Priority*	Agency
<b>8. Minimize waste of shark carcass through discards and facilitate full utilization of dead sharks for socio-economic benefits.</b>	<ul style="list-style-type: none"> <li>Enforce the ban on finning by using more observers on all fishing vessels, ensure regular on-board inspections, and presence of CCTV monitors on vessels.</li> </ul>	High	KeFS, KCGs
	<ul style="list-style-type: none"> <li>Monitor sharks catch during landings.</li> </ul>	High	KeFS, KCGs
	<ul style="list-style-type: none"> <li>Facilitate full utilization of dead sharks through value addition to shark meat (e.g. for fish meal production, sausages, etc) and attitude change on shark meat.</li> </ul>	Low	KeFS
	<ul style="list-style-type: none"> <li>Develop markets for</li> </ul>		KFMA,

	<p>shark meat both locally and internationally.</p> <ul style="list-style-type: none"> <li>Develop MCS SOPs and conduct inspections at port to ensure compliance in management and conservation of sharks</li> </ul>	<p>High</p> <p>High</p>	<p>KFIC, BMU Network, Traders</p> <p>KeFS, MCS interagency</p>
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**Goal 5: Improve and develop frameworks for establishing and coordinating effective stakeholder education and awareness creation, consultation of stakeholders on research, conservation, management and educational initiatives within Kenya and internationally.**

**Purpose:** Participatory stakeholder involvement in shark conservation is facilitated through their inputs into decisions on research, management and educational activities. Stakeholder capacity is enhanced through education and awareness creation on the ecological and socio-economic roles of sharks. There should also be transboundary consultations on conservation initiatives for the highly pelagic sharks. The objectives and actions under this goal are provided in the Table below:

Objectives	Actions	Priority*	Agency
<p><b>9. Promote public awareness and education on sharks, threats to sharks, their habitats and participatory roles of citizens in shark conservation.</b></p>	<ul style="list-style-type: none"> <li>Develop education materials on sharks and shark fishery at different levels including shark ID guides, posters, brochures, and school talks on sharks and documentaries.</li> </ul>	High	<p>KeFS, NGOs</p> <p>KWS, WRTI, KMFRI, Universities, the media.</p>
	<ul style="list-style-type: none"> <li>Develop information dissemination mechanism that</li> </ul>	High	<p>KeFS, County governments NGOs, KWS,</p>

<p><b>10. Enhance participation' of stakeholders in the conservation and management of sharks.</b></p>	<p>include online media, web-sites or web-links and other appropriate methods for disseminating shark information.</p> <ul style="list-style-type: none"> <li>• Draft MOUs or agreements with key stakeholders in the conservation of sharks enlisting their roles and obligations.</li> <li>• Ensure stakeholders (including vessel agents) participation in regular shark sensitization and training workshops as a condition for licensing and access.</li> </ul>	<p>High</p> <p>High</p>	<p>WRTI</p> <p>KeFs, NGOs KWS, WRTI, KMFRI</p> <p>KeFS, KMFRI, Ministry of foreign affairs, Attorney general.</p>
<p><b>11. Transboundary cooperation in the management of pelagic and highly migratory shark species.</b></p>	<ul style="list-style-type: none"> <li>• Explore mechanisms for joint agreements on the transboundary management of migratory sharks with strong links to CMS-sharks and IOTC requirements.</li> </ul>	<p>High</p>	<p>KeFS, IOTC, KWS</p>

**Goal 6: Facilitate improved species-specific catch and landings data collection and effective monitoring of shark catches, and collection of trade data.**

**Purpose:** Useful data collection is currently hampered by the difficulties in identifying specimens to species or other taxonomic levels by the fisheries staff at both national and county fisheries departments, fishers, traders and scientists and NGOs. Additionally,

fishers have no motivation to collaborate in species level reporting. Consequently, shark landings are lumped as “sharks and rays” making it difficult to use the information for stock assessment. There is need for enhanced capacity to record catches from different fisheries to species level using standardized data-sheets per fishery, and to have a trade database that has temporal consistency with strong links to CITES and FAO reporting requirements. The objectives and necessary actions under this goal are outlined in the Table below:

Objectives	Actions	Priority*	Agency
<b>12. Develop and improve collection of fishery-dependent data and species identification system.</b>	<ul style="list-style-type: none"> <li>Train data enumerators, observers, custom officials, scientists, fishers, traders and other stakeholders on shark ID skills.</li> </ul>	High	KeFS, KMFRI, NGOs, KWS, WRTI, county governments, FAO, IOTC, Customs Dept., coast guards, BMUs, Vet officers.
	<ul style="list-style-type: none"> <li>Produce fisheries-specific shark species ID guides translated into Kiswahili.</li> </ul>	High	KeFS, KMFRI, NGOs, Customs Dept. coast guards, BMUs, Vet officers.
	<ul style="list-style-type: none"> <li>Standardize catch data collection sheets for the different fisheries (artisanal, trawlers and longlines).</li> </ul>	High	KeFS, KMFRI, NGOs, vessel gents
	<ul style="list-style-type: none"> <li>Develop a training manual and train</li> </ul>		KeFS, KWS,

<p><b>13. Develop and improve trade data collection system on live sharks and shark products including fins, meat and cartilage.</b></p>	<p>data enumerators, observers, scientists on relevant web-based Fisheries Information Management Systems such as FIMS and IFMIS.</p>	<p>Medium</p>	<p>KMFRI. County Government, Fishing industry, universities.</p>
	<ul style="list-style-type: none"> <li>• Build capacity for fisher folks and other stakeholders (dive clubs, aquaria, tour guides) to support with data collection on species occurrence, distribution and critical habitat mapping.</li> </ul>	<p>High</p>	<p>KeFS, County Governments NGOs, BMUs</p>
	<ul style="list-style-type: none"> <li>• Strengthen collaborations with Customs Department and other agencies to capture data on import and export of shark products based on species and international coding system for products.</li> </ul>	<p>High</p>	<p>KeFS, KWS, fish and fish products export companies, Vets, Customs Dept.,</p>
	<ul style="list-style-type: none"> <li>• Build capacity of customs department staff and border points agencies on identification of shark fins by species.</li> </ul>	<p>High</p>	<p>KeFS, NGOs and other stakeholders</p>

**Goal 7: Contribute to the protection of biodiversity and ecosystem structure and function through research, conservation, and management.**

**Purpose:** Sharks play important ecological roles through cascading effects. As top predators, they regulate the populations of meso-predators, and hence stabilize ecosystem structure and functioning, they transfer nutrients between habitats, may mitigate climate change effects, enhance habitat connectivity, amongst other ecosystem services. It is therefore important to maintain diversity of sharks in an ecosystem and to understand shark-fisheries interaction through focused research initiatives facilitated by the objectives and actions outlined in the Table below:

Objectives	Actions	Priority*	Agency
<p><b>14. Build Research capacity and database on research outputs to improve understanding on sharks and shark-fisheries interactions.</b></p>	<ul style="list-style-type: none"> <li>Coordinate and prioritize areas of research for shark conservation and management including: critical habitat mapping, stock assessment, reference points, movement corridors, BRDs, fisheries interactions, life-histories.</li> </ul>	High	KeFS, KMFRI, NGOs, WRTI, KWS, county govts, BMUs, Fishing companies, IOTC
	<ul style="list-style-type: none"> <li>Develop memorandum of agreements (MOAs) with research-based NGOs to undertake research relevant to the implementation of NPOA-Sharks.</li> </ul>	High	KeFS, NGOs, WRTI, KWS
	<ul style="list-style-type: none"> <li>Build capacity of research scientists and students through training workshops, mentorship,</li> </ul>	High	KeFS, NGOs, KMFRI Universities

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\*Priority ratings: High (2023), Medium (2024-2025), Low (2025-2026)

## CHAPTER 7

### 7.0. LOGICAL FRAMEWORK FOR EVALUATION OF NPOA-SHARKS PERFORMANCE THROUGH OUTPUTS, OUTCOMES AND ACTIONS WITHIN SET TIME-FRAMES

Goals 1: Ensure that shark catches from directed and non-directed fisheries in Kenya are sustainable					
Objective	Outcome	Output	Actions	Time frame	Remarks
<b>A: Shark catches are managed sustainably for ecosystem services and livelihoods</b>	1.0. Shark stocks are stable with reduced long-term decline and livelihoods.	1.1. Develop a Fisheries Management Plan and regulations for sustainable shark catches.	1.1.1. Implement NPOA-Sharks through formation of National Shark Plan Implementation Committee (SPIC).	2023	Objective with tasks of mixed priorities to be coordinated by KeFS
			1.1.2. Register and License all fishing vessels and gears operating in the Kenya's Fishery Waters.	2023	
			1.1.3. Map and protect critical habitats.	2026	

			1.1.4. Work on spatial-temporal closures.	2026	
			1.1.5. Conduct and review risk assessments for shark species	2023	
			1.1.6. Conduct stock assessment and determination of reference points.	2026	
			1.1.7. Designate a Sharks Fisheries Officer responsible for enforcement of NPOA-sharks provisions.	2023	

<p><b>B: Promote alternative livelihoods for artisanal fishers to reduce fishing and allow for stock recovery</b></p>	<p>2.0. There is reduced fishing pressure on stocks through alternative shark-based livelihoods.</p>	<p>2.1. Regulations aimed at reducing fishing pressure on stocks through non-extractive benefit of sharks.</p>	<p>2.1.1 Build capacity and empower fishers in shark-based tourism/recreational activities (e.g. dive site identification, aggregation site locations, manta ray cleaning site locations, whale shark tourism).</p> <p>2.1.2. Support establishments of BMUs CMA measures for shark conservation and recreational activities</p>	<p>2026</p>	<p>Low priority objective to be coordinated by KeFS and county governments and be achieved within the span of the plan.</p>
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**Goal 2: Identify and provide special conservation and management attention, in particular to vulnerable or threatened species of sharks and their habitats**

Objective	Outcome	Output	Actions	Time frame	Remarks and responsibilities
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			live specimens and return to sea.		
<b>Goal 3: Minimize the incidental catch of sharks in the artisanal, prawn trawl, and longline tuna fisheries</b>					
Objective	Outcome	Output	Actions	Time frame	Remarks and responsibilities
<b>A: Reduce Incidental catches of sharks by the trawlers in Malindi-Ungwana Bay</b>	1.0. There is progressive decline in shark bycatch by prawn trawlers in the bay through use of BRDs, release to sea of live sharks through safe handling procedures.	1.1. Regulations and a protocol for best practices for bycatch reduction and shark handling in collaboration with the vessel agents.	1.1.1 Enforce use of bycatch reduction devices (BRDs) such as TED and on vessel CCTVs.	2023	This is a high priority objective requiring coordination by the KeFS, County Governments in collaboration with vessel owners and the Kenya Coast Guards (KCGs).
			1.1.2. Enforce return of live sharks to sea with records on returns per trawl transect.	2023	
			1.1.3. Investigate the post-release mortality rates of shark species.	2026	
			1.1.4. Ensure logbook records on shark species caught.	2023	

			1.1.5. Enforce finning ban on sharks.	2023	
			1.1.6. Build capacity and strengthen MCS activities on the trawlers including patrols.	2023	
			1.1.7. Publish protocols on safe handling of sharks on-board.	2023	
<b>B. Reduce incidental catches of sharks in the tuna longline fishery.</b>	2.0. There is reduced incidental catch of sharks by the longlines through gear modification and change in fishing behavior.	2.1. Regulations and requirements developed for bycatch reduction in the longline fishery involving vessel agents.	2.1.1.MSC strengthened to monitor regulations on need for de-hookers and line cutters on-board.	2023	This is a high priority objective requiring coordination by the SDBE&F, KeFS, KMFRI and collaboration of vessel owners.
			2.2.2. Ban wire traces and instead promote use of plastic leaders instead.	2023	
			2.2.3. Conduct gear based studies to	2024-	

<p><b>C: Reduce incidental catches of sharks in</b></p>	<p>3.0. Fishers are actively involved in shark bycatch</p>	<p>3.1. Education and awareness framework developed for participatory conservation actions by</p>	<p>advise on appropriate hook shapes and sizes to be used.</p> <p>2.2.4. Conduct gear selectivity studies and advise on the appropriate number of hooks per line and depth of hook deployment.</p> <p>2.2.5. Regulate on return of live sharks to sea following safe guidelines.</p> <p>2.2.6. Enforce on logbook records on species of sharks caught dead and live returns per each fishing trip.</p> <p>2.2.7. Publish and supply safe handling procedures of sharks on-board.</p>	<p>2025</p> <p>2024-2025</p> <p>2023</p> <p>2023</p>	<p>Requires participation of fishers, KeFS, SDBE&amp;F, county governments.</p>
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<b>artisanal fishery.</b>	reduction through behavior change.	fishers.	3.1.1. Regulate the return of live sharks to sea especially of the threatened species.	2023	
			3.1.2. Build capacity and awareness towards behaviour change to return immature sharks to sea.	2023	
			3.1.3. Strengthen co-management to protect areas of pupping or aggregation by the sharks through the BMU leaderships.	2023	
<b>Goal 4: Minimize waste and discards from shark catches, in accordance with Article VII.2.2(g) of the Code of Conduct for Responsible Fisheries (e.g. by requiring the retention of sharks from which fins are removed).</b>					
<b>Objective</b>	<b>Outcome</b>	<b>Output</b>	<b>Actions</b>	<b>Time frame</b>	<b>Remarks and responsibilities</b>

<b>A: Minimize waste of shark carcass through discards and facilitate full utilization of dead sharks for socio-economic benefits.</b>	1.0. There is increased observance of finning ban and retention of dead sharks with fins.	1.1. Reports on implementation of ban on shark finning and requirement to land sharks with fins attached.	1.1.1. Enforce FMDA ban on shark finning through enhanced MCS activities.	2023	This is an objective that is of high priority but has some actions that are of medium or low priority to be coordinated by the KeFS.
			1.1.2. Deploy observers on-board all fishing vessels.	2023	
			1.1.3. Introduce electronic monitoring (i.e. installation of on-board CCTV monitors).	2023	
	2.0. There is increased utilization of dead sharks for livelihoods.	2.1. Build capacity and provide guidelines for value addition and marketing of shark products.	2.1.1. Promote value addition of shark products such as meat and encourage shark meat consumption by citizens in a way	2025-2026	

			friendly to conservation. 2.1.2. Explore enhanced markets for shark products locally and internationally.	2025-2026	
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**Goal 5: Improve and develop frameworks for establishing and coordinating effective consultation involving all stakeholders in research, conservation, management and educational initiatives within Kenya and internationally.**

<b>Objective</b>	<b>Outcome</b>	<b>Output</b>	<b>Actions</b>	<b>Time frame</b>	<b>Remarks and responsibilities</b>
<b>A: Promote public awareness on threats to sharks, their habitats and participatory roles of citizens</b>	1.0. Citizens are aware of the importance of shark conservation.	1.1. Provide education and awareness framework for stakeholders and the public.	1.1.1. Develop education materials on sharks including: ID guides, posters, brochures and school talks.  1.1.2. Develop and	2024-2025	This is a medium priority objective to be coordinated by the KeFS

<p><b>in conservation.</b></p> <p><b>B. Enhance participation of stakeholders in the conservation and management of sharks.</b></p> <p><b>C: Engage coastal County Governments in the effective</b></p>	<p>2.0. More stakeholders are involved in decisions on research, conservation and management of sharks.</p> <p>3.0. County Governments are participating in the</p>	<p>2.1. A framework for stakeholder consultation and participation in shark conservation and management decisions is developed.</p> <p>3.1. Provide a framework for the involvement of county governments in</p>	<p>distribute education material using different media such as: documentaries, available material from IUCN, IOTC, FAO, and CMS.</p> <p>2.1.1. Draft MOUs/agreements with key stakeholders including NGOs on shark conservation detailing their participatory roles.</p> <p>3.1.1. Enter an agreement or MOU with county governments on</p>	<p>2024-2025</p> <p>2023-2024</p>	<p>To be coordinated by KeFS.</p> <p>Involve all county fisheries officers and coordinated</p>
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<b>implementation of shark conservation through NPOA-Sharks</b>	implementation of the provisions of NPOA-Sharks with the coordination of KeFS.	NPOA-Sharks implementation.	their roles in shark conservation and management with regard to: NPOA-implementation, management roles, financing of NPOA-Sharks, implementation, etc.	2023-2024	by KeFS and SDBE&F, County Govts.
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**Goal 6: Facilitate improved species-specific catch and landings data and monitoring of shark catches and biological and trade data**

<b>Objectives</b>	<b>Outcomes</b>	<b>Output</b>	<b>Actions</b>	<b>Time frame</b>	<b>Remarks and responsibilities</b>
<b>A: Develop and improve collection of fishery dependent data and capacity for species identification.</b>	1.1. Shark data collection is standardized per fishery and sharks are identified to species level in the records.	1.1. A plan is provided for improving data collection in inshore and offshore fisheries and species identification through capacity building.	1.1.1. Train fish enumerators, observers, researchers and other stakeholders on shark species identification skills.  1.1.2. Produce fisheries-specific shark species ID guides translated into Kiswahili.	2023  2023	This objective has actions whose priority range from high to low and will require participation of

			<p>1.1.3. Standardize catch data collection sheets by observers and researchers for the different fisheries (artisanal, trawlers and longlines)</p> <p>1.1.4. Support system development and training of enumerators and observers on Integrated Fisheries Information Management systems (FIMS/iFMIS) for input of all shark data.</p> <p>1.1.5. Engage with fishermen to help with data collection on species occurrence, distribution and critical habitat mapping.</p>	<p>2023</p> <p>2024-2025</p> <p>2025-2026</p>	<p>many stakeholders as identified by SPIC.</p>
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<b>B. Develop and improve trade data collection on shark products including fins, gills plates, meat and cartilage.</b>	2.0. There is a database on local and international trade in shark products	2.1. There is a management framework for capturing, storing and retrieving trade data for imports and exports of shark products.	2.1.1. Liaise with Customs Department to capture data on import and export of shark products based on species and international coding system for products.	2024-2025	KeFs, SDBE&F, Customs, Aquaria owners.
			2.1.2. Provide training to the customs department on identification of shark fins according to species.	2024-2025	

**Goal 7: Contribute to the protection of biodiversity and ecosystem structure and function through research, conservation, and management.**

<b>Objective</b>	<b>Outcome</b>	<b>Output</b>	<b>Actions</b>	<b>Time frame</b>	<b>Remarks and responsibilities</b>
<b>A: Build research capacity and</b>	1.0. Increased research activities and research	1.1. Research database on different research activities exists and sourcing of	1.1.1. Coordinate and prioritize areas of research for shark conservation and	2024-2025	This is a medium



## **CHAPTER 8**

### **8.0. INITIATION AND IMPLEMENTATION PROCESS OF THE NPOA-SHARKS**

Fisheries resources in Kenya are managed through the provisions of the Kenya Fisheries Development and Management Act, 2016, No. 35. The law empowers the State Department for the Blue Economy and Fisheries to oversee the policy implementation of the Act, while the Kenya Fisheries Service (KeFS) has the role of implementing the management provisions of the Act through the Kenya Fisheries Policy 2022. The NPOA-Sharks will therefore be implemented by the KeFS in collaboration with other state agencies that have legal provisions applicable to the conservation and management of sharks and other fisheries resources. The KeFS manages fisheries resources through Fisheries Management Plans (FMPs). So far, the following Management Plans are in place:

- a) The tuna management and development strategy
- b) The small and medium pelagic fisheries strategy
- c) The Aquarium fishery management plan
- d) The Prawn fishery management plan
- e) The Lobster fishery management plan

Relevant provisions of these plans will be used to implement the recommended actions contained in the NPOA-Sharks as and where applicable. However, as these FMPs are resource-specific, a Shark Management Plan is recommended to implement the provisions of the NPOA-Sharks.

The KeFS will bring the NPOA-Sharks into operation upon endorsement by the relevant administrative authority in the Ministry of Mining, Blue Economy and Maritime Affairs to which the State Department for Blue Economy and Fisheries belong.

## 8.2. Management organization, coordination and review

The multi-stakeholder Shark Plan Implementation Committee (SPIC, section 4.6) will form the coordination secretariat for the NPOA-Sharks. The composition of the SPIC will be determined by the KeFS. The committee will meet quarterly under the leadership of KeFS to determine the following in relation to their terms of reference (section 4.6.):

1. Prioritize the objectives and actions to be implemented and develop an implementation matrix and stakeholder responsibilities and time-lines for actions based on the logical framework and the available funding.
2. Determine information gaps requiring research.
3. Coordinate the responsibilities and actions of stakeholders in relation to the goals, objectives and actions.
4. Organize for the financial requirements, obligations and stakeholder contributions in kind or financial following an ICZM approach.
5. Provide progress reports to KeFS under its internal and external reporting system.
6. Review the action plan's progress annually and at the expiry of the plan's four-year duration.

The review of the plan on the short-term (annually) will consider the progress with respect to prioritized goals and objectives, the challenges and new opportunities. These short-term reviews will feed into the final plan review at the expiry of the 4-year period and will consider: achievements, constraints, new developments in shark conservation, any additional objectives or redundant ones, changes in priorities, and modalities of the review process.

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## ANNEXES

## ANNEX 1

## Shark species occurring or thought to occur in Kenya's EEZ

Occurrence, diversity, gear-species interactions and conservation status of shark species on the Kenyan coast. IUCN Red List of Threatened Species Version 2022-1 ([www.iucnredlist.org](http://www.iucnredlist.org)) IUCN conservation categories: CR- critically endangered, EN – endangered, VU- vulnerable, DD – data deficient, LC- least concern.

Family	Species name	IUCN status	Fishery-gear interactions
Alopiidae	<i>Alopias pelagicus</i>	EN	Trawl, Handline, Longline
Alopiidae	<i>Alopias superciliosus</i>	VU	Trawl, Longline, Handline
Alopiidae	<i>Alopias vulpinus</i>	VU	Longline
Carcharhinidae	<i>Carcharhinus albimarginatus</i>	VU	Trawl, Longline, Gillnet, Handline
Carcharhinidae	<i>Carcharhinus altimus</i>	NT	
Carcharhinidae	<i>Carcharhinus amblyrhynchos</i>	EN	Trawl, Gillnet, Handline, Longline
Carcharhinidae	<i>Carcharhinus amboinensis</i>	VU	Trawl
Carcharhinidae	<i>Carcharhinus falciformis</i>	VU	Trawl, Longline, Gillnet, Handline
Carcharhinidae	<i>Carcharhinus humani</i>	DD	Gillnet, Handline, Ringnet, Trawl
Carcharhinidae	<i>Carcharhinus leucas</i>	VU	Trawl, Gillnet, Handline
Carcharhinidae	<i>Carcharhinus limbatus</i>	VU	Trawl, Handline
Carcharhinidae	<i>Carcharhinus longimanus</i>	CR	Longline
Carcharhinidae	<i>Carcharhinus macloti</i>	NT	Trawl, Gillnet, Handline, Longline
Carcharhinidae	<i>Carcharhinus melanopterus</i>	VU	Trawl, Gillnet, Handline, Longline
Carcharhinidae	<i>Carcharhinus plumbeus</i>	EN	Handline

Carcharhinidae	<i>Carcharhinus sorrah</i>	NT	Gillnet, Handline, Ringnet
Carcharhinidae	<i>Loxodon macrorhinus</i>	NT	Trawl, Handline
Carcharhinidae	<i>Negaprion acutidens</i>	EN	
Carcharhinidae	<i>Prionace glauca</i>	NT	Trawl, Longline
Carcharhinidae	<i>Rhizoprionodon acutus</i>	VU	Trawl, Gillnet, Handline, Ringnet
Carcharhinidae	<i>Scoliodon laticaudus</i>	NT	
Carcharhinidae	<i>Triaenodon obesus</i>	VU	Gillnet, Handline, Ringnet
Odontaspidae	<i>Carcharias taurus</i>	CR	
<i>Centrophoridae</i>	<i>Centrophorus granulosus</i>	EN	Handline
<i>Centrophoridae</i>	<i>Centrophorus moluccensis</i>	VU	Trawl
Galeoceridae	<i>Galeocerdo cuvier</i>	NT	Longline, Gillnet, Handline, Trawl
Ginglymostomatidae	<i>Nebrius ferrugineus</i>	VU	
Ginglymostomatidae	<i>Pseudoginglymostoma brevicaudatum</i>	CR	Trawl, Gillnet
Hemigaleidae	<i>Hemipristis elongata</i>	VU	Trawl
Hemigaleidae	<i>Paragaleus leucolomatus</i>	VU	
Heterodontidae	<i>Heterodontus ramalheira</i>	DD	Trawl
Hexanchidae	<i>Heptranchias perlo</i>	NT	Trawl
Hexanchidae	<i>Hexanchus nakamurai</i>	NT	Handline, Longline, Trawl, Handline
Lamnidae	<i>Carcharodon carcharias</i>	VU	Longline
Lamnidae	<i>Isurus oxyrinchus</i>	EN	Longline
Lamnidae	<i>Isurus paucus</i>	EN	Longline
Pentanchidae	<i>Bythaelurus hispidus</i>	NT	
Pentanchidae	<i>Halaelurus boesemani</i>	VU	
Pentanchidae	<i>Holohalaelurus grennian</i>	DD	Trawl
Pentanchidae	<i>Holohalaelurus melanostigma</i>	LC	Trawl

Pristiophoridae	<i>Pliotrema warreni</i>	DD	
Pristiophoridae	<i>Pristiophorus nancyae</i>	LC	Trawl
Proscyllidae	<i>Eridacnis radcliffei</i>	LC	
Proscyllidae	<i>Eridacnis sinuans</i>	LC	
Pseudocarchariidae	<i>Pseudocarcharias kamoharai</i>	LC	
Rhincodontidae	<i>Rhincodon typus</i>	EN	
Scyliorhinidae	<i>Cephaloscyllium sufflans</i>	NT	Trawl
Sphyrnidae	<i>Sphyrna lewini</i>	CR	Trawl, Longline, Gillnet, Handline, Ringnet
Sphyrnidae	<i>Sphyrna mokarran</i>	CR	
Squalidae	<i>Cirrhigaleus asper</i>	DD	Trawl
Squalidae	<i>Squalus mahia</i>	DD	
Squalidae	<i>Squalus bassii</i>	EN	Trawl
Squatinae	<i>Squatina africana</i>	NT	Trawl, Gillnet, Handline
Stegostomatidae	<i>Stegostoma tigrinum</i>	EN	Trawl
Triakidae	<i>Hypogaleus hyugaensis</i>	LC	Longline
Triakidae	<i>Mustelus manazo</i>	EN	Gillnet, Handline
Triakidae	<i>Mustelus mosi</i>	NT	Gillnet, Handline

## ANNEX 2

## Ray species occurring or thought to occur in Kenya's EEZ

Occurrence, diversity, gear-species interactions and conservation status of ray, shark-like ray species on the Kenyan coast. IUCN Red List categories, release 2022-1 ([www.iucnredlist.org](http://www.iucnredlist.org)). IUCN conservation categories: CR- critically endangered, EN – endangered, VU- vulnerable, DD – data deficient, LC- least concern.

Family	Species name	IUCN status	Fishery-gear interactions
Aetobatidae	<i>Aetobatus ocellatus</i>	VU	Gillnet, Handline, Longline, Ringnet, Trawl
Chimaeridae	<i>Hydrolagus africanus</i>	LC	
Dasyatidae	<i>Bathytoshia lata</i>	VU	Trawl, Longline
Dasyatidae	<i>Himantura leoparda</i>	VU	Longline
Dasyatidae	<i>Himantura uarnak</i>	EN	Trawl, Gillnet, Handline, Longline
Dasyatidae	<i>Maculabatis ambigua</i>	NT	Trawl, Gillnet, Handline, Longline, Ringnet
Dasyatidae	<i>Megatrygon microps</i>	DD	
Dasyatidae	<i>Neotrygon caeruleopunctata</i>	LC	Gillnet, Handline, Ringnet, Speargun
Dasyatidae	<i>Pastinachus ater</i>	VU	Gillnet
Dasyatidae	<i>Pateobatis fai</i>	VU	Gillnet, Handline
Dasyatidae	<i>Pateobatis jenkinsii</i>	VU	Gillnet, Ringnet
Dasyatidae	<i>Pteroplatytrygon violacea</i>	LC	Longline
Dasyatidae	<i>Taeniura lymma</i>	LC	Trawl, Gillnet, Handline, Ringnet, Speargun, Trap
Dasyatidae	<i>Taeniurops meyeri</i>	VU	Trawl, Gillnet
Dasyatidae	<i>Urogymnus asperrimus</i>	VU	
Dasyatidae	<i>Urogymnus granulatus</i>	VU	Gillnet
Glaucostegidae	<i>Glaucostegus halavi</i>	CR	Trawl
Gurgesiellidae	<i>Cruriraja parcomaculata</i>	LC	Trawl
Gymnuridae	<i>Gymnura poecilura</i>	VU	
Mobulidae	<i>Mobula birostris</i>	EN	Trawl

Mobulidae	<i>Mobula eregoodoo</i>	EN	
Mobulidae	<i>Mobula kuhlii</i>	EN	Trawl, Gillnet
Mobulidae	<i>Mobula mobular</i>	EN	Trawl, Handline
Myliobatidae	<i>Aetomylaeus vespertilio</i>	EN	
Myliobatidae	<i>Myliobatis aquila</i>	CR	Trawl
Narcinidae	<i>Narcine rierai</i>	DD	
Rajidae	<i>Dipturus springeri</i>	LC	Trawl
Rajidae	<i>Dipturus stenorhynchus</i>	DD	
Rajidae	<i>Leucoraja elaineae</i>	DD	
Rajidae	<i>Okamejei heemstrai</i>	LC	
Rajidae	<i>Raja clavata</i>	NT	Trawl
Rajidae	<i>Raja ocellifera</i>	EN	
Rajidae	<i>Rostroraja alba</i>	EN	
Rhinidae	<i>Rhina ancylostoma</i>	CR	Trawl, Gillnet
Rhinidae	<i>Rhynchobatus australiae</i>	CR	Ringnet, Gillnet
Rhinidae	<i>Rhynchobatus djiddensis</i>	CR	Trawl, Gillnet
Rhinobatidae	<i>Acroteriobatus leucospilus</i>	EN	Gillnet
Rhinobatidae	<i>Acroteriobatus ocellatus</i>	DD	Trawl
Rhinobatidae	<i>Acroteriobatus zanzibarensis</i>	NT	Gillnet, Handline
Rhinobatidae	<i>Rhinobatos holcorhynchus</i>	DD	Trawl, Handline
Rhinopterae	<i>Rhinoptera jayakari</i>	EN	Gillnet, Ringnet, Handline, Longline
Torpedinidae	<i>Torpedo sinuspersici</i>	DD	Trawl

**ANNEX 3****FAO (1999) International Plan of Action for Sharks (IPOA) recommended goals for the National Plan of Action for Sharks.**

<b>Goal Number</b>	<b>Description</b>
1	Ensure that shark catches from directed and non-directed fisheries are sustainable.
2	Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term economic use
3	Identify and provide special attention, in particular to vulnerable or threatened shark stocks.
4	Improve and develop frameworks for establishing and coordinating effective consultation involving all stakeholders in research, management and educational initiatives within Kenya and internationally.
5	Minimize the unutilized incidental catch of sharks from all fisheries
6	Contribute to the protection of biodiversity and ecosystem structure and function.
7	Minimize waste and discards from shark catches, in accordance with Article VII.2.2(g) of the Code (e.g. by requiring the retention of sharks from which fins are removed).
8	Encourage full use of dead sharks for the socio-economic benefit of the citizens.
9	Facilitate improved species-specific catch and landings data and monitoring of shark catches.
10	Facilitate the identification and reporting of species-specific biological and trade data.

## ANNEX 4

## List of stakeholders to the conservation and management of sharks in Kenya

Stakeholder	Interest/Relevant Role
State Department for Fisheries Aquaculture and the Blue Economy	Oversees fisheries policy development
Kenya Fisheries Service	Has the mandate to conserve, develop and manage fisheries resources in Kenya.
Fishermen and their representatives: Gillnet, purse seine fishers, representatives of the BMU from the five Coastal Counties	Direct exploitation of sharks and rays as by-catch and directed catch.
Prawn trawlers within Malindi Ungwana bay	Direct exploitation of sharks and rays as by-catch
Longline and purse seine vessel operators-industrial fisheries offshore	Direct exploitation of sharks and rays as by-catch
County Governments department of Fisheries: Mombasa, Kilifi, Kwale, Lamu and Tana River	Management of fisheries resources in the Counties under the devolved function.
Kenya Marine Fisheries Research Institute	Provide technical information on status of marine resources based on research outputs.
Kenya Wildlife Service	Conservation of wild flora and fauna on the Kenyan Coast including the marine parks and reserves.
Aquarium Companies (e.g. Kenya Tropical Sea Life Ltd.)	Stocking and sale mostly of juvenile sharks and rays.
Recreational Dive Companies	Potential dive sites used by rays (Manta and devil), cleaning sites, whale sharks diving, reef shark dives.
Non-governmental conservation organizations; CORDIO-EA, WCS, WWF among others	Have expertise and interest in the conservation of marine biodiversity including conservation based research and community mobilization.
Wildlife Research and Training Institute	Wildlife research
Aquarium Companies	Trade in live specimens of sharks and rays
Sport Fishing Companies	Involved in recreational activities including fishing on shark and ray aggregations
Customs Department	Monitoring in trade in shark products such as fins, meat, cartilage
African Billfish Foundation	Charity foundation aimed at smart conservation of marine resources.

## ANNEX 5

**Shark and ray species evaluated by the Ecological Risk Assessment (ERA) as being Highly Vulnerable to Fisheries in Kenya's EEZ.**

Sharks and rays evaluated as being Highly Vulnerable Species Assemblage (HVSA) to gear-fisheries in coastal Kenya, identifying which gear-fisheries are of potential impact to each species. IUCN Red List categories are presented (CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, DD = Data Deficient, LC = Least Concern), species common names adopted from [www.iucnredlist.org](http://www.iucnredlist.org) release 2022-1.

Species	Common name	IUCN Status	Gear/fishery
<b>A. Shark Species</b>			
<i>Sphyrna lewini</i>	scalloped hammerhead shark	CR	Industrial Longline, Gillnets, Handlines, Prawn trawls
<i>Carcharhinus plumbeus</i>	sandbar shark	EN	Industrial Longlines
<i>Prionace glauca</i>	blue shark	NT	Industrial Longlines
<i>Carcharodon carcharias</i>	white shark	VU	Industrial Longlines
<i>Carcharhinus falciformis</i>	silky shark	VU	Industrial Longlines, Prawn Trawls
<i>Alopias vulpinus</i>	common thresher shark	VU	Industrial Longlines
<i>Triaenodon obesus</i>	whitetip reef shark	VU	Handlines, Prawn Trawls,
<i>Squatina africana</i>	african angelshark	NT	Prawn Trawls
<i>Halaaelurus boesemani</i>	speckled catshark	VU	Prawn Trawls
<i>Carcharhinus albimarginatus</i>	silvertip shark	VU	Prawn Trawls
<i>Carcharhinus leucas</i>	bull Shark	NT	Prawn Trawls
<i>Carcharhinus macloti</i>	hardnose shark	NT	Prawn trawls
<i>Carcharhinus melanopterus</i>	blacktip Reef shark	VU	Prawn Trawls
<i>Mustelus mosis</i>	arabian smoothhound	NT	Prawn Trawls
<i>Stegostoma tigrinum</i>	zebra Shark	EN	Prawn Trawls
<i>Pseudoginglymostoma</i>	shorttail nurse	CR	Prawn Trawls

<i>brevicaudatum</i>	shark		
<i>Pliotrema warreni</i>	warren's six gill sawshark	LC	Prawn Trawls
<b>B. Ray Species</b>			
<i>Pteroplatytrygon violacea</i>	pelagic stingray	LC	Industrial Longlines
<i>Mobula birostris</i>	oceanic manta ray	EN	Industrial Longlines
<i>Rhinoptera jayakari</i>	oman cownose ray	EN	Industrial Longlines
<i>Mobula eregoodoo</i>	longhorned pygmy devil ray	EN	Industrial Longline
<i>Rhina ancylostoma</i>	bowmouth guitarfish	CR	Prawn Trawls
<i>Rhynchobatus djiddensis</i>	whitespotted wedgefish	CR	Prawn Trawls
<i>Rhynchobatus laevis</i>	smoothnose wedgefish	CR	Gillnets
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	VU	Prawn Trawls
<i>Gymnura poecilura</i>	Longtail Butterfly Ray	VU	Prawn Trawls
<i>Pateobatis jenkinsii</i>	Jenkins' Whipray	VU	Prawn Trawls
<i>Maculabatis ambigua</i>	Baraka's Whipray	NT	Trawls
<i>Pastinachus ater</i>	Broad Cowtail Ray	VU	Prawn Trawls
<i>Taeniurops meyeri</i>	Blotched Fantail Ray	VU	Prawn Trawls