DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT

NO. 3488 **2 June 2023**

NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004)

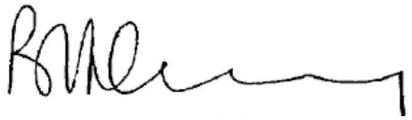
DRAFT SHARK BIODIVERSITY MANAGEMENT PLAN

I, Barbara Dallas Creecy, Minister of Forestry, Fisheries and the Environment, hereby invite members of the public to comment on the draft Shark Biodiversity Management Plan (SBMP) in terms of sections 43(1) and 99, read with section 100 of the National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004). Copies of the draft SBMP can be downloaded from the website of the national Department of Forestry, Fisheries and the Environment: **www.dffe.gov.za** or can be obtained electronically upon request by email to **marinespecies@dffe.gov.za**.

Members of the public are invited to submit written representations on, or objections to, the draft SBMP within 30 (thirty) days after the publication of this notice in the *Gazette* or newspaper, whichever is the later. Written representations or objections received after this time may not be considered. All representations and comments must be submitted in writing to the Deputy Director–General of the national Department of Forestry, Fisheries and the Environment, Branch: Oceans and Coasts:

By hand: The Deputy Director-General
Attention: Ms. Zintle Langa
National Department of Forestry, Fisheries, and the Environment
Branch: Oceans & Coasts
1 East Pier Building, East Pier Road
V&A Waterfront, Cape Town
By e-mail: marinespecies@dffe.gov.za

By post to: The Deputy Director-General
Attention: Ms. Zintle Langa
National Department of Forestry, Fisheries, and the Environment
Branch: Oceans & Coasts
P.O. Box / Private Bag x4390
Cape Town, 8002



BARBARA DALLAS CREECY
MINISTER OF FORESTRY, FISHERIES AND THE ENVIRONMENT

DRAFT SOUTH AFRICAN SHARK BIODIVERSITY MANAGEMENT PLAN

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DEFINITIONS

"Attract"	to feed, chum or bait, or to use any other means, method or device to lure or attract a live specimen
"Biological diversity" or "Biodiversity"	The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part and also includes diversity within species, between species and of ecosystems;
"Bycatch"	The part of a catch of a fishing unit taken incidentally in addition to the target species towards which fishing effort is directed (MLRA definition: any species landed in addition to a target species for which a permit has been issued);
"Chum"	means scenting or using pieces of an animal weighing more than 10 grams, in the water to lure a live specimen of a listed threatened or protected marine species;
"Critical habitats"	Habitats that are of critical importance to portions of a species' life history e.g. pupping, mating, nursery, aggregation and feeding areas;
"Ecosystem"	A dynamic complex of animal, plant and micro-organism communities and their non-living environment interacting as a functional unit;
"Ecotourism"	A form of tourism involving visiting and observing nature and the environment including key species, while impact on an intended species is low and sustainable.;
"Exclusive economic zone"	The exclusive economic zone (EEZ) as defined in section 7 of the Maritime Zones Act 1994 (Act No. 15 of 1994);

"Global change"	Changes in the global environment (including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, and ecological systems) that may alter the capacity of the Earth to sustain life;
"Habitat"	Means a place where a species or ecological community naturally occurs;
"Invasive species"	Any species whose establishment and spread outside its natural distribution range threaten ecosystems, habitats or other species or have demonstrable potential to threaten ecosystems, habitats or other species and may result in economic or environmental harm or harm human health;
"Listing"	The categorisation of shark species in terms of their conservation status according to section 52 (1) of the National Environmental Management Biodiversity Act, 2004 (Act No.10 of 2004);
"Marine Protected Area"	A marine area that is declared as a protected area in terms of Section 22A of the National Environmental Management Protected Areas, 2003 (Act. No. 57 of 2003);
"MPA management authorities"	All management authorities that have been appointed by the Minister of Forestry, Fisheries and the Environment to monitor and manage marine protected areas (MPAs) on its behalf;
"NEMBA"	National Environmental Management Biodiversity, 2004 (Act No. 10 of 2004)
"Non-consumptive use"	The non-extractive use of a living resource;

"Optimal use"	The use of a species and or an ecosystem in such a way that it has the greatest economic and social benefit and is not detrimental to its survival (i.e. maintain its sustainability);
"Pollution"	Any change in the environment caused by 1.) substances; 2.) radioactive or other waves; 3.) noise, odours, dust or heat; emitted from any activity, including the storage and treatment of waste, or substance, construction or provision of services, whether engaged in by any person or organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on material useful to people, or will have such an effect in the future;
"Precautionary approach"	Where there are threats of serious or irreversible damage, lack of full scientific certainty shall be not used as a reason for postponing cost-effective measures to prevent environmental degradation;
"Protected species"	Any shark species declared by gazette notice in terms of section 56 (1) of NEMBA which is protected;
"Provisioning"	The act of offering or providing a food stimulus to sharks;
"Distribution Range"	All the areas of water that a shark inhabits, stays in temporarily, or crosses at any time on its normal migration route;
"Research institutions"	Organisations including tertiary institutions with a capacity to undertake research on biodiversity conservation, sustainable use and protection; and must be registered in terms of the Threatened or Protected Marine Species Regulations, 2017;

"RFMO"	An intergovernmental fisheries organisation or arrangement, as appropriate, that has the competence to establish conservation and management measures;
"Shark"	Any species in the Class Chondrichthyes, which includes sharks, rays, skates and chimaeras;
"Shark Control Mechanism/ Program"	Refers to bather safety programs administered by KZNSB that may include shark nets, drumlines and/or any combination thereof;
"Shared populations"	Shark populations whose range extends over the EEZ of more than one country;
"South African Waters"	-its internal waters which include all harbours; -its territorial waters which include the sea within a distance of twelve nautical miles from the baselines established in terms of the Maritime Zones Act 15 of 1994. (A nautical mile approximates to 1.85 kilometers); -its contiguous zone, including its marine cultural zone, which includes the sea beyond the territorial waters but within a distance of 24 nautical miles from the baselines; -its EEZ which includes the sea beyond the territorial waters but within a distance of 200 nautical miles from the baselines; and -its continental shelf as defined in Article 76 of the United Nations Convention on the Law of the Sea;
"Species of conservation concern"	Protected species which are of high conservation value and or national importance that they require national protection

	although may not be declared by gazette notice in terms of section 56 (1) of NEMBA;
"Sustainable"	The use of a biological resource, in a way and at a rate that- 1.) would not lead to its short, medium or long term decline; 2.) would not disrupt the ecological integrity of the ecosystem in which it occurs; and 3.) would ensure its continued use to meet the needs and aspirations of present and future generations of people;
"Threatened species"	Any shark species that is declared threatened or protected by gazette notice in terms of section 56 (1) of the National Environmental Management Biodiversity Act (No.10 of 2004);

ACRONYMS

BCC	Benguela Current Commission
CBD	Convention on Biodiversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species
COFI	FAO Committee on Fisheries
DFFE	National Department of Forestry, Fisheries and the Environment
DME	National Department of Mineral Resources and Energy
ECPTA	Eastern Cape Parks and Tourism Authority
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMIs	Environmental Management Inspectorates
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
FAO	Food and Agriculture Organisation of the United Nations
FCOs	Fishery Control Officers
FRM	The Branch: Fisheries Management within DFFE

GIS	Geographic Information System
ICCAT	International Commission for the Conservation of Atlantic Tunas
IOTC	Indian Ocean Tuna Commission
IPOA-Sharks	International Plan of Action for the Conservation and Management of Sharks, adopted at the 23rd session of the FAO Committee on Fisheries, February 1999
IUCN	International Union for the Conservation of Nature
IUU	Illegal, unreported and unregulated (fishing)
KZN	KwaZulu-Natal
KZNSB	KwaZulu-Natal Sharks Board
MLRA	Marine Living Resources Act (No. 18 of 1998)
MPA	Marine Protected Area
NEMBA	National Environmental Biodiversity Act (No. 10 of 2004)
NGO	Non-governmental Organisation
NPOA-Sharks	National Plan of Action for the Conservation and Management of Sharks
O&C	Branch: Oceans and Coasts within DFFE
OCS	Oceans Conservation Strategies
OCR	Oceans and Coasts Research
ORI	Oceanographic Research Institute
RFMO	Regional Fisheries Management Organisation
SAEON	South African Environmental Observation Network
SAIAB	South African Institute for Aquatic Biodiversity
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SWIO	South West Indian Ocean
BMPS	Biodiversity Management Plan for Species
Shark MoU	Memorandum of Understanding on the Conservation of Migratory Sharks

1. INTRODUCTION

The acknowledgement of Chondrichthyan species as being particularly vulnerable to various threats was initially considered in international treaty law from a perspective of sustainable and equitable harvest, and later in trade. However, the direct consideration of shark conservation concerns was first contemplated under the Convention for the Conservation of Migratory Species of Wildlife (CMS) and its later sub-agreement, in the Memorandum of Understanding for the Conservation of Migratory Shark Species (Shark MoU). In 2011, South Africa became a signatory to CMS and the development of the first Shark Biodiversity Management Plan (BMP) was a natural translation of the agreement into domestic policy.

The first Shark Biodiversity Management Plan (SBMP) was developed and gazetted in March 2015, under the provisions of the National Environmental Management Plan: Biodiversity Act, 2004 (Act No. 10 of 2004). The SBMP was developed to formalise the conservation-orientated initiatives being undertaken on a national and regional scale,and provide the mechanism whereby these efforts could be coordinated, directed, and implemented to the benefit of all shark species and their habitats. It was identified that there was a need for alignment across sectors of conservation, management, research, and sustainable use, and the SBMP would serve as a tool for achieving this.

1.1. SHARK BIODIVERSITY MANAGEMENT PLAN 2015-2021: REVIEW AND FEEDBACK

The 2015 SBMP was drafted by a core group of researchers and managers representative of several governmental departments and parastatals involved with shark conservation, research and resource use. The subsequent sourcing of specialist inputs and stakeholder engagement process, was aimed at achieving a broad inclusion of expertise while ensuring that all concerns relating to shark conservation and management were considered and addressed within the final gazetted document. The outcome was a large document covering broad threat categories and actions to address them through over a hundred key activities. Further to this, the responsibility for these activities and actions was assigned across a broad number of government departments and management authorities, to be coordinated by the Department of Forestry, Fisheries and the Environment. Difficulties in implementation arose due to the ambitious scope of the document,while the intention of attempting to address all potential threats to achieving favourable conservation status of sharks as a group appeared reasonable. The timeframe and capacity that it would require exceeded that which was available within the Department. Further to this, while actions and joint responsibility for outputs had been agreed upon in the finalisation of the plan, prioritisation for achieving these outputs was not shared by collaborating institutions. Upon review, it was acknowledged that subsequent iterations of a SBMP should be more focused and practical, and while the 2015 SBMP was the first attempt at a comprehensive plan for shark conservation, future versions required a more succinct and directed approach. Despite these challenges, progress on targets were achieved through:

i. **Establishment of the Shark Advisory Group:** A steering committee was nominated by the Department's Branch: Oceans and Coasts (O&C) to oversee the implementation of the management plan. The Advisory Group is comprised of individuals from government institutions

and the private sector in order to promote a close working relationship and information sharing on shark- related activities.

ii. **Establishment of a coordinated legislative framework towards shark conservation:** Review and revision of the regulations under NEMBA to include provisions within "listed activities" and the criteria for listing species in terms of the TOPS regulations. This included the incorporation of provisions to protect tourism-significant species. The White Shark Cage Diving (WSCD regulations were revised and gazetted in 2017.

iii. **Data collection, research, and long-term monitoring of shark species:** Baseline assessment of South African shark species was undertaken to generate a register of South African shark species and associated data. Between 2015 and 2021, the Department has issued over 20 research permits annually to institutions that conduct scientific investigations on shark populations and habitats. In an effort to mobilize and improve data availability, shark data and decision support tools have been incorporated into MIMS/OCIMS application platforms.

iv. **Management of potential anthropogenic impacts related to non-consumptive use of shark species:** Marine tourism is an expanding segment of both international and domestic tourism. Non-consumptive use of shark species for tourism purposes is regulated through permit requirements in terms of the National Environmental Management: Biodiversity Act, 2004: Threatened or Protected Marine Species Regulations, 2017 as well as through the regulations declaring the specific marine protected areas. The existence of the enabling legislation has contributed to the management of shark diving tourism activities through permit conditions. This has further encouraged increased participation from those interested in the sector and to expand to other feasible areas. Diving, snorkeling, and swimming with shark species that are not formally protected in terms of the Marine TOPS Regulations and Marine TOPS Listsis not regulated, irrespective of the use of chum, but these activities are regulated if they are undertaken within an MPA.

v. **Increased protection of habitats significant for sharks**: Through the declaration of additional MPAs, notably the uThukela Banks, an important nursery areas for several shark species, Protea Banks, which is a known aggregation site for several specie,s and the Southwest Indian Seamount MPA, which incorporates habitats identified as globally significant for the conservation of shark species in the region.

vi. **Several education and awareness:** Activities driven by Non-Governmental Organisations (NGOs) have emerged in recent years and positively contribute to raising the profile of shark conservation. Further to this, foundational processes relating to the review and processing of permitting requests have been streamlined. Initiatives directed at improving consultation, exchange of information, and public and stakeholder communication have been very effective. These improved relations with the Department have generated greater willingness among various institutions to contribute tangibly to ongoing departmental initiatives, i.e. Marine spatial planning, MIMS/OCIMS, and national biodiversity assessments.

1.2. PURPOSE OF THE SHARK BIODIVERSITY MANAGEMENT PLAN

Section 43 of NEMBA provides for the development of Biodiversity Management Plans (BMP) for indigenous species that have been formally protected in terms of section 56 of NEMBA, or for a migratory species to give effect to national obligations in terms of an international agreement. To this effect, the Department developed norms and standards for the development of BMPs which were gazetted in March

2009.[1] The purpose of these Norms and Standards is to provide a national approach and define minimum criteria for the development of biodiversity management plans for species. Further to this, the structure and content of BMPs are defined within these regulations.

As such, the SBMP serves as a national guideline document directed at the conservation of shark species. Through the SBMP, South Africa recognizes the concerns expressed by many international bodies, primarily the United Nations Environmental Program (UNEP), the United Nations Food and Agriculture Organisation (FAO), and the International Union for Conservation of Nature (IUCN). The SBMP also entrenches South Africa's commitment to international treaty law relating to shark conservation, management, and sustainable use. The content of the SBMP draws heavily from the Convention on the Conservation of Migratory Species of Wild Animals (CMS), the CMS Memorandum of Understanding for the Conservation of Migratory Shark Species (Shark MoU), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Convention on Biological Diversity (CBD).

The goal of the SBMP is to achieve and maintain a favorable conservation status for sharks within South Africa's waters. The conservation status of shark species and their habitats would be "favorable" when all the following conditions are met:

- Their range or habitats are currently not reduced to levels or quality that cannot sustain viable populations in the long term, nor are likely to be so reduced in future;
- The abundance and structure of their populations remain at levels that are adequate for maintaining ecosystem integrity.

The conservation status of sharks and their habitats will be taken as "unfavourable" if any of the conditions set out above are not met.

The SBMP is directed at shark species as a whole, inclusive of their habitats and gives equitable consideration to their intrinsic conservation and cultural value as well as their commercial value and includes legislative, strategic, and research-related aims for the conservation and management of sharks.

Drawing from experience from the SBMP 2015, the need to prioritise and focus actions and activities is necessary. These priorities will be re-evaluated in subsequent iterations of the SBMP and should speak directly to issues of national importance

The focus areas of the SBMP:

i. Shark Tourism

[1] National Environmental Management: Biodiversity Act (10/2004) Norms and Standards for Biodiversity Management Plans for Species (2 March 2009) Norms and standards for Biodiversity Management Plans for ecosystems (7 February 2014)
S43. Biodiversity management plans
(1) Any person, organisation or organ of state desiring to contribute to biodiversity management may submit to the Minister for his or her approval a draft management plan for-
(b) an indigenous species-
(i) listed in terms of section 56; or
(ii) which is not listed in terms of section 56 but which does warrant special conservation attention; or
(c) a migratory species to give effect to the Republic's obligation in terms of an international agreement binding on the Republic.

ii. Spatial management and protection
iii. Species protection
iv. Compliance and Enforcement

1.2 AIMS AND OBJECTIVES

The implementation of the SBMP is aimed at improving shark conservation through:

i. Facilitating the implementation of shark conservation measures in a coordinated and timely fashion;
ii. in conjunction with the NPOA for Sharks (2013), it aims to bridge shark fisheries and conservation interests by ensuring that all threats to sharks, skates, rays and chimaeras are investigated;
iii. contributing to the implementation of the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) of the FAO and building on it; and
iv. adding to global shark conservation efforts in the areas of research, monitoring, data collection and analysis, threat definition and reduction, habitat identification and protection, education and public awareness, information exchange, and capacity building.

Objectives of the Shark Biodiversity Management Plan

i. Identify and protect critical shark habitats
ii. Identify and mitigate threats to shark populations
iii. Identify and provide special protection to threatened shark species or populations
iv. Optimise existing or new MPAs to provide protection for sharks
v. Facilitate the inclusion of shark and shark biodiversity into existing government initiatives
vi. Promote and facilitate the development of shark ecotourism
vii. Support the management of threats relating to Illegal, Unregulated and Unreported fishing activities as per the NPOA Sharks II
viii. Mitigate user group conflict in collaboration with the NPOA Sharks II
ix. Improve scientific knowledge that is used to make informed management decisions;
x. Coordinate and undertake conservation-orientated shark research and management, with particular reference to priority shark species.

1.4. DEVELOPMENT, IMPLEMENTATION, AND MONITORING OF THE BIODIVERSITY MANAGEMENT PLAN

The current plan is a revised version of the draft gazetted in 2015. This plan also has a five-year timeline that outlines key components which can be used to monitor and assess progress in the finalisation and implementation of the plan.

1.4.1. Drafting and Finalisation of the Shark BMP

1.4.1.1. Planning and drafting of Shark BMP

Drafting and revisions of the BMP will be undertaken by the Shark Advisory Group during targeted workshop sessions focusing on the following key areas: Shark Tourism, Spatial Management and Protection, Species Protection and Compliance and Enforcement. Proceedings of the targeted workshop

sessions must be recorded for transparency and accountability purposes as well as to secure shared commitment to implement the plan once finalized. The Draft revised Shark BMP will then be presented at the TOP Predator Marine Working Group for noting. The document will also be presented to the Departmental MINTEC Working Groups before being gazetted for public comment (i.e. Public Consultation Process).

1.4.1.2. Public Consultation Process

To ensure a fair and transparent public consultation process, a public notice alerting stakeholders of the open period to submit comments on the revised draft BMP will be published in two national newspapers and the Department's website. The public consultation process will be open for a period of 30 calendar days. Should a need arise, public consultation workshops may be held at key locations as an opportunity to promote information sharing and public awareness of the need to contribute to shark conservation and protection.

1.4.1.3. Finalization of the Shark BMP

It must be emphasized that representations received during the public consultation process will be considered for incorporation into the final draft of the Shark BMP. Once comments are assessed, a final draft BMP will be submitted through the Departmental processes to the Minister for approval in accordance with section 43 of NEMBA.

1.4.2. Implementation of the Shark BMP

The Shark BMP recognizes the need to strengthen conservation efforts in the protection of shark populations in terms of threats not related to fisheries. Key steps are listed in the Action Plan table below (Section 4). These will be further developed, enhanced, and improved through the public engagement process. A foundation step in the implementation of the SBMP will be establishing the Shark Advisory Group.

1.4.2.1. Establishing a Shark Advisory Group for the Coordination of Conservation Management Actions

Establish a Steering Committee (Shark Advisory Group) that will coordinate and monitor the implementation of the Shark BMP. The Shark Advisory Group will constitute a long-term structure that will encourage stakeholder participation and promote close working relations and information-sharing as it relates to the implementation of the Shark BMP. The Group will consider a range of issues across tourism, spatial management, species protection, provision of management recommendations, stakeholder engagement, and improving compliance and enforcement.

1.5. LEGISLATIVE CONTEXT

The SBMP Plan responds to a range of national legislation and international agreements (see below):

1.4.1 National Legislation

- Constitution of Republic of South Africa, 2005 (Act No. 5 of 2005)
- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

- The Threatened or Protected Marine Species Regulations (GN R.477 of *Government Gazette* 40876 of 30 May 2017)
- National Environmental Management: Protected Areas Act, 2003 (Act No.57 of 2003)
- National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)
- National Environmental Management: Marine Spatial Planning Act, (Act No 16 of 2018)
- Marine Living Resources Act, 1998 (Act No.18 of 1998)
- Animal Protection Act,1962 (Act No. 71 of 1962)
- Societies for the Prevention of Cruelty to Animals Act, 1993 (Act No.169 of 1993)
- Maritime Zones Act, 1994 (Act No. 15 of 1994)
- Dumping at Sea Control Act, 1980 (Act No. 73 of 1980)
- Mineral and Petroleum Resources Development Act, 2002 (No. 28 of 2002)
- Municipal Systems Act, 2000 (Act No.32 of 2000)
- National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- South African Maritime Safety Authority Act, 1998 (Act No. 5 of 1998)
- Wreck and Salvage Act, 1996 (Act No. 94 of 1996)
- The Hazardous Substances Act, 1973 (No.15 of 1973)
- KwaZulu-Natal Sharks Board Act, 2008 (Act No.5 of 2008)

1.4.2 International Agreements

- The Convention on Biological Diversity (CBD)
- The Convention on the Conservation of Migratory Species of Wild Animals (CMS); and sub-agreement, Memorandum of Understanding on the Conservation of Migratory Sharks (Shark MoU)
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

1.4 3 Institutional Arrangements

The SBMP will be implemented by DFFE, primarily within the Branch Oceans & Coasts, while the NPOA-Sharks will be implemented within the Branch Fisheries Management.

2. THREATS

1.1. FFISHERIES

The regulatory mandate of fisheries resources, their regulation and management is carried out by DFFE, through the Branch: Fisheries Management (FM). A national plan of action for sharks (NPOA-Sharks) has been developed by FM to promote sustainable fishing and guide the implementation of responsible shark fishing practices. The development of the NPOA-Sharks was undertaken in consultation with O&C and other relevant stakeholders, and constitutes a complementary policy to the SBMP, which is directed at mitigating fisheries as a threat to sharks, while facilitating sustainable economic use of shark resources. The NPOA-Sharks Action Table has been appended to this document for ease of reference (APPENDIX 1: SHARK NATIONAL PLAN OF ACTION TABLE).

The NPOA Sharks II was developed with the aim of improving the protection for sharks, rays, and chimeras impacted by fisheries. The plan is focused primarily on ways to provide and improve science-based management of these species. Several Actions in the NPOA Sharks II Action plan intersect with the SBMP and will require extensive collaborations to complete. Details of fisheries that impact sharks in terms of target and by-catch can be found in the NPOA Sharks II.

1.2. BATHER SAFETY /SHARK ATTACK MITIGATION

The Natal Anti-Shark Measures Board was appointed formally in 1964 to address bather safety in relation to shark attacks along the Kwazulu-Natal coastline. The coastal and beach tourism in the province had been threatened with collapse as a result of an increased incidence of shark attacks and in response, the Board was appointed to devise and advise on the implementation of mitigation measures. The KwaZulu-Natal Sharks Board (KZNSB), as it now exists, is established under the KwaZulu-Natal Sharks Board Act, 2008 (Act No. 05 of 2008). The provisions of that Act impose an obligation on the provision of sound and tested bather safety and shark attack mitigation measures and stipulates the extent and criteria under which this duty is applied.

At present, the measures employed involve the use of large-mesh gillnets and/or baited drumline installations, focused on fishing for sharks within inshore areas at bathing beaches. These two types of gear installations are one of the only proven mitigation measures to reduce the risk of shark attack and is employed in the shark control programs of New South Wales and Queensland on the east coast of Australia. In KZN, the introduction of bather protection gear has greatly reduced the incidence of shark attack at protected beaches. This is in contrast to shark attacks in both the Eastern and Western Cape, where such incidents are not uncommon.

The nets are approximately 210 m long and 6.3 m deep, with a stretched mesh of 51 cm and are set parallel to, and approximately 300–500 m fromthe shore in a water depth of 10–14 m. Drumlines, which are anchored adjacent to the nets consist of a single Mustad 4480DT 14/0 J hook suspended 4 m beneath a large float. Each hook is baited with a fish of 300-500 g. The gear is serviced daily, Monday to Friday, weather dependent, in an effort to minimise the mortality of non-target species, including sharks, in the installations.

The annual contribution of tourism to the economy of KZN is approximately R10bn and employs 200,000 people. While coastal tourism has diversified since the KZNSB's establishment, beach tourism remains a primary attraction and economic contributor, with the majority of infrastructure in the province associated with coastal resorts. The KZNSB bather protection programme is a key component in securing and facilitating growth in the beach tourism sector, and the service is currently provided to five

municipalities at 37 popular swimming beaches.

Further to bather safety, the KZNSB has a mandate to undertake, facilitate and contribute to research. The core areas of research have been investigation of alternative shark control and non-lethal mitigation technologies, and processing and cataloguing samples and catch and biological data collected from animals caught in this programme. The KZNSB is recognised internationally for its contributions to research, a training institution for researchers, its well established publication history and the holder of several shark deterrent technology patents.

The role of the KZNSB must be contextualised within the framework of the impact of these shark control measures on shark populations. These installations are designed to remove large sharks from inshore areas, thereby reducing the risk of a potentially dangerous shark coming into contact with a swimmer or surfer. Annual catch reports submitted to the Department assist with monitoring and quantifying catches, which are negligible in relation to other fisheries. Further to this, the KZNSB and the Department have jointly committed to a reduction in the length of netting deployed at protected beaches. In 1990, there was 44km of netting and 0 drumlines protecting 44 beaches. This has changed to 13.5 km of netting and 177 drumlines at 37 beaches in 2022. Drumlines are far more selective than nets, espedially in terms of ray, cetacean and turtle bycatch, and are therefore used through the annual sardine run and the whale season. At the same time the nets are removed to avoid excessive catches of predators pursuing the sardines or to prevent entanglement of whales. Further efforts toward gear reduction require consultation with municipalities and coastal communities without compromising bather safety.

2.4. HABITAT DEGRADATION AND LOSS

The life history characteristics of shark species are often linked to distinct ecosystems and geographic localities, resulting in a situation where recruitment is dependent on the quality and availability of these preferred habitats. While terminology and the definition of these habitats vary, the term critical habitat encompasses those sites associated with mating and feeding aggregations and gestation and nursery grounds. Critical habitats are areas essential to the persistence or recovery of a species or population. In order to identify these areas, it is important to understand the species requirements based on their ecology and life-history traits. The location and function of thesse critical habitats are well documented for some South African species, e.g. ragged-tooth sharks' reproductive philopatry to the east coast of South Africa, however, for the majority of shark species site-specific research, knowledge the literature is lacking. When sufficient data are lacking, inferences from existing data can be generated i.e. estuarine and mangrove habitat being identified as critical pupping and nursery habitat for Zambezi (Bull) sharks in several global studies has been validated anecdotally and later scientifically for several estuaries domestically along the KZN coastline.

In order to address data deficits, a consolidation of existing data and data sources is necessary. The scope of current research needs to be extended and information mobilised into existing research planning and habitat mapping initiatives. At present spatial conservation and management initiatives, i.e. Environmental Impact Assessments (EIA) processes, estuarine management plans and integrated coastal management processes need to be directed toward shark conservation consideration, in addition to traditional instruments of marine spatial protection.

2.5. LACK OF INFORMATION

Scientific research is vital to improve our understanding of shark biology, ecology, and population status, and for assessing the impact of human activities on sharks. While our information base has improved,

our ability to address many shark conservation and management issues is still constrained by gaps in information. While prioritisation of efforts have evolved, access to and mobilisation of data generated needs to be fostered. Mechanisms to promote incorporation of data, from researchers working within national waters, into governmental registries, needs to be facilitated. MIMS and OCIMS exist as platforms to facilitate data mobilisation and sharing, however a willingness or imperative for domestic research to contribute to these platforms, needs to be invoked.

3. STRATEGIC MANAGEMENT PRIORITIES

3.1 IMPROVED CONSERVATION STATUS OF SHARKS

The Class Chondrichthyes (sharks, rays, skates and chimeras), or "sharks" are a distinct branch of vertebrate species recognised for their age, with a fossil record dating back some 455 million years, and consequent evolutionary history. As a result, sharks have evolved into distinct and complex species, which reflect high degrees of specialisation in their morphology and physiology, life-history characteristics and trophic presentively across many aquatic ecological pyramids. Their complexity and refinement contribute directly to the vulnerability of shark species to threat. Projections of extinction risk of shark species were demonstrated to be a function of their life history and ecological traits in relation to threat (Carrier, Musick & Heithaus, 2012; Sorenson, Santini & Alfaro, 2014).[2] Depending on species, factors such as large body size, low intrinsic rate of population increase, high trophic level, small geographic range, shallow water and inshore/coastal habitat preference, in addition to ecological specialization, were found to have a direct relationship with the vulnerability of shark species to threat and concomitantly their conservation status.

The first global synthesis of IUCN Red List Assessments of Chondrichthyan species (Dulvy et al., 2014) [3] indicated that of the 1,041 assessed species, 181 (17.4%) were classified as falling into a "threatened" category: 25 (2.4%) were assessed as Critically Endangered (CR), 43 (4.1%) Endangered (EN), and 113 (10.9%) Vulnerable (VU). A further 132 species (12.7%) were categorized as Near Threatened (NT). Chondrichthyans have the lowest percentage (23.2%, n = 241 species) of Least Concern (LC) species of all vertebrate groups, including the marine taxa assessed to date. Almost half (46.8%, n = 487) are Data Deficient (DD), meaning that information is insufficient to assess their status.

In 2021, the IUCN Red List Assessment of Chondrichthyan species was reviewed and revised estimates indicate that over one-third of chondrichthyans are threatened with extinction globally. Of 1,199 species assessed 391 (32.6%) are threatened, with 90 (7.5%) Critically Endangered (CR), 121 (10.1%) Endangered (EN) and 180 (15%) identified as Vulnerable (VU). A further 124 species (10.4%) are classified as Near Threatened (NT) and less than half (44.1%, n = 529) are considered Least Concern (LC). This represents significant increases in all categories. Data Deficiency (DD) however dropped from

[2] Sorenson, L., F. Santini, and M. E. Alfaro. "The effect of habitat on modern shark diversification." Journal of Evolutionary Biology 27.8 (2014): 1536-1548. (Jennings et al., 1998; Davies et al., 2006).
Carrier, Jeffrey C., John A. Musick, and Michael R. Heithaus, eds. Biology of sharks and their relatives. CRC press, 2012.
Camhi, Merry D., Ellen K. Pikitch, and Elizabeth A. Babcock, eds. Sharks of the open ocean: biology, fisheries and conservation. Vol. 15. John Wiley & Sons, 2009.
[3] Dulvy, Nicholas K., et al. "Extinction risk and conservation of the world's sharks and rays." elife 3 (2014): e00590.

46.8% to 12.9%, however it is noted that Data Deficiency should be considered as an intrinsic risk and factored into species risk profile.

A regional assessment[4] of extinction risk of the sharks and rays endemic to coastal, shelf, and slope waters of the SWIO (Namibia to Kenya, including SWIO islands) was published in 2021. Of the 70 species assessed, 13 species (19%) were found to be threatened, 1 Critically Endangered, 5 Endangered, and 7 Vulnerable. A further 7 (10%) were listed as Near Threatened, 33 (47.1%) as Least Concern, and 17 (24.2%) as Data Deficient. Further to this, of the 194 specis known to occur in South Africa, 43% are regarded as threatened by the IUCN. South Africa was identified as having the highest conservation responsibility, due to the level of species representivity in its national waters, followed by Mozambique and Madagascar.

Currently two species occurring within our national waters have been categorised as "locally extinct". The two sawfish species, largetooth sawfish (*Pristis pristis)* and green sawfish (*P. zijsron),* were last recorded in 1999 within their distribution along the KwaZulu-Natal coastline and estuaries.[5]

3.2 IDENTIFY AND ASSESS SPATIAL AND SPECIES CONSERVATION PRIORITIES

A taxonomic checklist of the chondrichthyans of South Africa was recently published (2021) and is the first revision of shark biodiversity in over three decades. South Africa is ranked fifth globally as far as its shark biodiversity is concerned, with 191 species, comprising 50 families and 103 genera. There are 30 families, 64 genera and 111 species of sharks; 17 families, 36 genera and 72 species of batoids; and 3 families, 5 genera and 8 species of chimaeras. The most species-rich shark families are the whaler sharks Carcharhinidae with 20 species, followed by the deep-water catsharks Pentanchidae with 13 species. The most species-rich batoid families are the hardnose skates Rajidae with at least 21 species, followed by the stingrays Dasyatidae with 13 species. Despite the recent nature of this confirmation of South Africa's rich shark biodiversity, there has been a historic emphasis on South Africa as a priority region for securing the conservation of global shark diversity.

A 2015 IUCN guideline publication[6], generated in the context of the 2014 global IUCN assessment of chondrichthyan species, outlines the global priorities in shark conservation and management to improve

[4] Pollom, Riley, et al. "Overfishing and Climate Change Elevate Extinction Risk of Endemic Sharks and Rays in the Southwest Indian Ocean Hotspot." (2021).

[5] Unconfirmed records or species which were incorrectly identified recorded in South Africans waters include: Slendertail Lanternshark *(Etmopterus cf. molleri* (Whitley, 1939)),Whitespotted Bullhead Shark *Heterodontus ramalheira* Smith, 1949), African Dwarf Sawshark *(Pristiophorus nancyae* Ebert & Cailliet, 2011), Smoothback Angelshark (*Squatina oculata* Bonaparte, 1840), Fleshynose Catshark *(Apristurus melanoasper* Iglesias, Nakaya & Stehmann, 2004), Mud Catshark *(Bythaelurus lutarius* Springer & D'Aubrey, 1972), Night Shark (*Carcharhinus signatus* Poey, 1868), Mozambique Numbfish (*Narcine rierai* Lloris & Rucabado, 1991), Bottlenose Wedgefish (*Rhynchobatus australiae* Whitley, 1939), Narrow Skate (*Okamejei heemstrai* McEachran & Fechhelm, 1982), Sparsethorn skate (*Rajella paucispinosa* Weigmann, Stehmann & Thiel, 2014), Black Legskate (*Indobatis ori* Wallace, 1967), Whitespotted Whipray (*Himantura gerrardi* Gray, 1851), Bleeker's Whipray (*Pateobatis uarnacoides* Bleeker, 1852), Banded Eagleray (*Aetomylaeus nichofii* Bloch & Schneider, 1801), Sicklefin Chimaera (*Neoharriotta pinnata* Schnakenbeck, 1931) (Cliff, 2022[5])

[6] Bräutigam, A., Callow, M., Campbell, I.R., Camhi, M.D., Cornish, A.S., Dulvy, N.K., Fordham, S.V., Fowler, S.L., Hood, A.R., McClennen, C., Reuter, E.L., Sant, G.,Simpfendorfer, C.A. and Welch, D.J. (2015). Global Priorities for Conserving Sharksand Rays: A 2015–2025 Strategy.

the conservation status of sharks by 2025. Recommendations outlined in this publication are consistent with IUCN global conservation and extinction risk assessments.[7] Priority regions that were identified, based on species richness, endemism and biodiversity, include the SWIO, incorporating the east coast of South Africa.

The greatest species richness occurs in the coastal shelf waters of the tropics and particularly at the boundary with subtropical ecosystems, with South Africa being noted as a priority region for conservation in the 2015 IUCN report, the 2017 and 2020 publications by Dulvy *et al*. and in the 2021 regional assessment the region[8]. South Africa's South East Atlantic territorial watersis categorised in the medium to high index of relative species richness, but ranks significantly with regard to the relative extinction risk for species occurring in this region, especially in its offshore, deep-water habitats. Recent analysis of spatial protection within in the SWIO indicates that current MPAs coverage only affords protection to 1.7% of the distributional range of endemic species.[9]

Fisheries and spatial management measures are both tools which can address shark and ray population declines, as many species can benefit from spatial protection when they congregate in mating areas and nursery habitats. However, owing to their wide-ranging spatial distributions and movement characteristics, sharks and rays have been overlooked as focal species in the designation of MPAs (Giménez et al., 2020[10]). To address this, a systematic conservation plan for sharks and rays was developed (Faure-Beaulieu et al., 2022[11]) to assess the current representation of shark and ray species in South Africa's MPA network and identify possible areas for zonation, expansion or creation of new MPA zones. A systematic and data-driven approach is used to identify areas for protection (Margules & Pressey, 2000[12]). SCP considers biodiversity features as well as socio-economic costs to allow for informed choices on which areas should be put aside for protection. SCP also requires explicit quantitative targets or goals (Margules & Pressey, 2000).

Species prioritisations relevant ino the national context include guitarfish (family Rhinobatidae) and wedgefish (family Rhinidae), angelsharks (including data deficiency and extinction concerns for *Squatina oculata*), mobulid/ devil rays *Mobula* spp., thresher sharks *Alopias* spp., oceanic whitetip shark *Carcharhinus longimanus*, dusky shark *Carcharhinus obscurus*, zebra shark *Stegostoma tigrinum* and mako sharks *Isurus* spp.[13] Further to this, deep-water and endemic species require prioritisation, and it

[7] Derrick, Danielle H., Jessica Cheok, and Nicholas K. Dulvy. "Spatially congruent sites of importance for global shark and ray biodiversity." PloS one 15.7 (2020): e0235559.
Dulvy, Nicholas K., et al. "Challenges and priorities in shark and ray conservation." Current Biology 27.11 (2017): R565-R572.
Dulvy, Nicholas K., et al. "Overfishing drives over one-third of all sharks and rays toward a global extinction crisis." Current Biology 31.21 (2021): 4773-4787.
Derrick, Danielle H., Jessica Cheok, and Nicholas K. Dulvy. "Spatially congruent sites of importance for global shark and ray biodiversity." PloS one 15.7 (2020): e0235559.

[8] Cheok, Jessica, et al. "Post-2020 Kunming 30% target can easily protect all endemic sharks and rays in the Western Indian Ocean and more." bioRxiv (2021).

[9] Cheok, Jessica, et al. "Post-2020 Kunming 30% target can easily protect all endemic sharks and rays in the Western Indian Ocean and more." bioRxiv (2021).

[10] Giménez, J., Cardador, L., Mazor, T., Kark, S., Bellido, J. M., Coll, M., & Navarro, J. (2020). Marine protected areas for demersal elasmobranchs in highly exploited Mediterranean ecosystems. Marine Environmental Research, 160, 105033.

[11] Faure Beaulieu, N., Lombard, A., Olbers, J.M., Goodall, V. and J.M. Harris. 2022. A systematic conservation Plan for sharks and rays in South Africa. *WILDTRUST Unpublished Reports* 3. 76pp.

[12] Margules, C. R., & Pressey, R. L. (2000). Systematic conservation planning. 405, 11.

[13] Species listed under CMS, CITES or referenced specifically in Dulvey et al 2017 and Cheok et al 2021

is recommended that data deficiencies be addressed in order to facilitate more accurate assessments and enable more accurate regional planning and management.

Current and future models for spatial assessment of conservation priorities require consideration of the relative conservation importance of species at national and global scales, and while these have been incorporated into domestic processes for increasing spatial protection, consideration must also be given to habitat quality.

3.3 SHARK TOURISM

Marine tourism is recognised as a rapidly growing economic sector, with immense growth potential in context of South Africa's large EEZ and ecological richness.[14]Operation Phakisa is a national initiative focused on unlocking the economic potential of South Africa's oceans through six identified focus areas, of which coastal and marine tourism is one of them.[15]

The shark ecotourism industry in S.A. can be categorised as either directed, or incidental. Directed tourism tends to be focused on a single species, and in areas where a species aggregates or occurs in abundance e.g. White Shark Cage Diving. This type of shark tourism usually targets the larger, more charismatic species and often involves activities like chumming, to attract animals into viewing proximity and/or extend the duration of the interaction. Incidental shark tourism involves observations of sharks and rays that are occur during the course of other activities, such as scuba and snorkel diving or kelp forest, seabird and other general ecotourism activities supplementary to the ecosystem being viewed e.g. kelp forest or seabird tours.

White Shark Cage Diving is the most established shark ecotourism industry in S.A. The industry is legislated under the white shark cage diving policy and associated regulations published under NEMBA's Threatened and Protected Marine Species Regulations. The industry consists of 20 permitted entrants distributed across 5 allocated areas of operation, subject to review every 5 years. The industry is a flagship ecotourism experience for S.A. and since its inception in 1991, has contributed to the concept of shark conservation and the utility of non-extractive use. Estimation of the value of this industry vary significantly across studies however it is estimated that the industry in Gansbaai contributes USD4.4 million[16] to the town economy and direct value estimate of the False Bay industry generates an estimated USD2 million into the surrounding communities annually.[17] The tiger shark tourism industry is centred within the Aliwal Shoal MPA and is regulated under exemptions which are renewed annually, and it has an estimated annual direct value of R12 million.[18] Shark biodiversity and seasonal influxes of a number of different species increases provide attractions within the SCUBA diving tourism areas. Sodwana Bay

[14] Dwyer, Larry. "Emerging ocean industries: Implications for sustainable tourism development." *Tourism in Marine Environments* 13.1 (2018): 25-40.
[15] https://www.dffe.gov.za/projectsprogrammes/operationphakisa/oceanseconomy
[16] Hara, M, Maharaj, I and Pithers, L. 2003. Marine-based tourism in Gansbaai: A socio-economic study Final report for the Department of Environmental Affairs and Tourism (DEAT), South Africa [Google Scholar]
[17] Mabaleka, Nolwazi Milliscent. The contribution of shark cage diving tourism to coastal economies: A case study of a coastal town in the Western Cape, South Africa. Diss. Cape Peninsula University of Technology, 2020.
[18] Dicken, M. L., and S. G. Hosking. "Socio-economic aspects of the tiger shark diving industry within the Aliwal Shoal Marine Protected Area, South Africa." African Journal of Marine Science 31.2 (2009): 227-232.

is a popular dive site in the Isimangaliso Wetland Park. Seasonal aggregation of raggedtooth sharks, whale sharks and manta rays along its reef complexes were noted to be an incentive for divers to visit the park and direct revenue to the MPA was estimated at R75 million.[19] The sardine run is an annual winter occurrence. The migration of large shoals of these bait fish result in highly transient feeding aggregations of several predatory species, including several sharks. Much of the tourism activity is centred within the Pondoland MPA and is estimated to contribute approximately R5.47 million to coastal communities and the MPA.[20]

At present there is a mix of well-established, regulated and emerging shark tourism operations in S.A. Emerging shark tourism initiatives include, blue and mako shark diving offshore of Cape Point, multi-species viewing opportunities in the Protea Banks MPA, cow and shyshark diving in False Bay. While these emerging initiatives are possibly not currently at a scale that warrants regulation, there is a need to evaluate how these opportunities can be developed sustainably. Considerations of the carrying capacity of areas and the need to mitigate potential negative impacts on focus species and their habitats is critical to developing sustainable and economically viable tourism activities.

[19] Dicken, M. L. Socio-economic aspects of the Sodwana Bay SCUBA diving industry, with a specific focus on sharks. African Journal of Marine Science 36.1 (2014): 39-47.
[20] Dicken, M. L. Socio-economic aspects of boat-based ecotourism during the sardine run within the Pondoland Marine Protected Area, South Africa. African Journal of Marine Science 32.2 (2010): 405-411.

4. SHARK BIODIVERSITY ACTION PLAN

1. Spatial management and protection

Objective	Action	Indicator	Responsibility	Time Frame	Budget/Funding
Optimise protection of sharks in existing MPAs	Assess shark biodiversity in existing MPA network	Collating and reporting all the existing information pertaining to the protection within existing MPAs (include literature reviews, long-term research, time series data on trends and status of sharks). List of shark species occurring in each MPA drafted.	OCR T/SANBI/Management Authorities/SAIAB	2024-2030	150 000.00
	Identifying all the projects and programs that exist	Report on existing projects and program compiled and presented at the Scientific Working Group and/Management Working Group.		2024-2030	NA
	Identifying priority species not impacted by fisheries for research	Completion of Gap Analysis to identify key species that would benefit from research within OCR. This would include species not covered under the NPOA Sharks II so that there is limited duplication of research efforts.	OCR	2024-2030	450 000.00
	Maximise efficacy of existing MPAs Network	Research initiatives aimed at investigating existing MPAs and their conservation outcome for sharks, facilitated. Analysis of report on research findings of the efficacy of the MPA network. Completion of report investigation how current MPAs protect sharks.	OCR/Management Autorities/Academic Institutions/SAIAB/ (ATAP/Wildoceans/ Fisheries	2024-2030	MOUs to used

		Research initiatives aim at investigating new MPAs and their conservation outcomes for sharks facilitated. Conduct research/ facilitate research on prioritised species.			
		Conduct research on residency of priority species in MPA/s identified. Initiate monitoring study on habitat use within MPA/s Research findings to be presented at Scientific Working groups (e.g TOP Predators etc) .	OCR Management Authorities, Academia, NGOs	2024-2030	MOUs
		Provide recommendations for any adjustment of existing MPAs boundaries and/zonation.	OCR	2024-20230	N/A
		Provide inputs into TOPS to improve conservation value of existing MPA network for sharks.	OCR	2024-2030	N/A
	Review use of nets within the MPAs	Report indicating review of the use of shark safety gear within the MPA submitted to the Minister Report indicating the review of other nets usage and the existence of	KZNSB and CoCT Management Authorities	2024-2030	800 000.00

		ghost fishing gear within the MPA drafted and submitted. Report completed and presented to both Scientific Working Group and/Management working Groups			
Protect critical shark habitat	Identify and assess critical habitats	One workshop/meeting held to collate information on observed critical habitat	OCR	2024-2030	80 000.00
		Critical shark habitat for priority species investigated and identified based on spatial, and temporal significance. Research on critical habitat for priority species conducted/ facilitated. Desktop report compiled and presented to Scientific Working Group. Research report presented at TOP predator Working Group.	OCR	2024-2030	MOUs
		Critical habitat mapped and prioritised based o i.) Conservation status of species ii.) species diversity iii) habitat quality. Service provider sourced	OCR	2024-2030	

	Incorporate shark conservation into existing spatial management/ conservation initiatives.	Provide recommendations on shark conservation that support the existing initiatives and mechanism. Specific shark measures are included in all MPA management plans, Estuarine Management plans, and Marine Spatial planning initiatives.	OCS	2024 -2030	
Regional management plans for transboundary TOPs listed shark species that regularly cross over into neighbouring countries' EEZ	Identify transboundary shark species which regularly cross over into neighbouring countries EEZ e.g., great white shark	List of species that regularly cross over into the EZZ of neighbouring countries & which need regional management plans	OCR/OCS	2024 -2030	
	Draft regional management plans (one per year).	Regional management plan drafted			
	Systematic evaluation of priority species	Workshop with experts in shark species conducted.			
2. SPECIES PROTECTION					
Objective	**Action**	**Indicator**	**Responsibility**	**Time Frame**	**Budget/Funding**

Prioritise Chondrichthyan Species	Identify the category of prioritization Prioritize Chondrichythyan Species.	Priority Species category/criteria identified Priority species listed in relation to: i. Research and data collection ii. Conservation prioritisation iii. Management intervention iv. Identification of major threats Prioritise species based on research, management, conservation, with special discussion of data deficient species	OCR / FISHERIES MANAGEMENT BRANCH OF DFFE ??	2024 -2030	
	Review existing information available	a report of the existing information available and incorporate any excluded species compile and consolidated. Identify research priorities and initiate research project on priority species. Draft species profile not included in the current profile (SA Species Profile Endangered Endemic) Report presented to Scientific Working Groups and Management Working Groups.	OCR / Fisheries/Management Authorities	2024 -2030	
	Provide protection for species	Conduct Ecological Risk Assessment for recommendations for species protection. Increase legislative protection of sharks not related to fisheries for	OCS / OCR	2024 -2030	

		endemic species listed as Endangered to Criticallly Endangered on the IUCN Red list. List and recomend review of the legislative framework. Recommendations on species to be considered for inclusion in TOPS drafted, sent for stakeholder comments and submit Recommendations requesting the amendment of fisheries regulations and species listing pertaining to extractive use of shark resources	OCR/ FISHERIES		
	Explore the application of protection level indicators of sharks	Report to be presented to the TOP predator scientific working group.	OCS/OCR/Fisheries/ Management Authorities	2024 -2030	
	Understand impact of recreational catch-and-release shark fishing (trophy fishing)	Draft a report of TOPS / threatened species that are regularly the target of catch-and-release fishing for sport Report to be presented to the TOP predator scientific Working group.	OCR/Fisheries/Management Authorities		
		Draft code of conduct for trophy fishing with clear guidelines when a TOPS species is caught for sport.	OCR with extensive stakeholder consultation		
		Support research to understand the impact of catch-and-release trophy fishing on TOPS species.	OCR/academic institutions/industry groups/		

		Develop a list of priority research projects for students and external researchers to guide research priorities based on shark prioritised in Action. Report to be presented at TOP Predator Scientific Working Group.	OCR/SANBI/management authorities/academic instititutions/NGOs		

3. SHARK TOURISM

Objective	Action	Indicator Number	Indicator	Responsibility	Time Frame	Budget/Funding
Promote and facilitate the development of shark ecotourism.	Research on white sharks' shift in distribution from WSCD areas i.e. False Bay and Gansbaai to the Eastern Cape		Consolidate and facilitate research to understand the shift in distribution of white sharks from key known areas i.e. False Bay and Gansbaai WSCD areas to the Eastern Cape as a result of orca predation. A socio-economic impact study of the white shark shift in distribution on shark ecotourism as a result of orca predation through extensive socio-economic surveys conducted. Consolidating the above findings in a report on ways DFFE can facilitate the long-term stability of shark eco-tourism. Promote and facilitate bather protection in areas no frequented by white sharks.		2024 -2030	

		Reports to be presented at the TOP predator working group.			
	Identify new areas/ species/ opportunities for tourism	List of aggregation/ high residency areas compiled New sites identified for other shark diving tourism established and declared. Report presented to Top predator working group. Investigate feasibility of identified areas for tourism Feasibility report of identified areas for tourism presented at Top predator working group. Conduct risk assessments for any new areas for shark related tourism Report presented at Top Predator scientific working group.	OCR DOT/OCR	2024 -2030	
	Improve existing shark ecotourism initiatives	Coastal MPAs providing shark biodiversity promoted with promotional material developed. Collate information obtained from research project on movement and	OCR / SANBI / SANPARKS OCR/OCS	2024 -2030	

		residency of great white sharks (satellite and acoustic telemetry) Report presented at Scientific and/ Management working GroupsTop.			
		Develop criteria for identifying new sites or species for tourism. Identify new sites for WSCD /White sharks tourism Develop code of conduct for ecotourism per species per area			
	Promote non-consumptive use and protection of tourism significant species and areas	List of important tourism species and their known aggregation sites drafted Recommendations for protection (removal from commercial and recreational fishing allowances) of tourism species at known aggregation sites Develop permit requirements to conduct Shark Filming.	OC/OCR / Fisheries	2024 -2030	
4. COMPLIANCE AND ENFORCEMENT					
Objective	**Action**	**Indicator**	**Responsibility**	**Time Frame**	**Budget/Funding**
Support the management of threats relating to Illegal, Unregulated and	Improve conviction rates of illegal activities of TOPS species	Draft impact statements for TOPS species e.g. white sharks to assist prosecution forviolation of legislation		2024 -2030	

Unreported fishing activities as per the NPOA Sharks II	Ensure adequate training of EMIs and FCO.	Frequent training of EMIs and FCOS	OC/OCR and Fisheries (also covered by the NPOA Sharks II)	2024 -2030	

APPENDIX 1: SHARK NATIONAL PLAN OF ACTION TABLE

ISSUE CLUSTER	ISSUE DESCRIPTION	ACTION NUMBER	ACTION	MEASURABLE INDICATORS	PRIORITY (as judged by the panel)	Responsibility
Foundations	Species prioritization - prioritise Chondrichthyes in need of research, assessment and management intervention	1	Input into and completion of species profiles report	Completion of report	Yes	
		2	Species prioritization through gap analysis and Management Rapid Assessment Indicator procedure (MRAIT). Research plan developed.	Scientific Working Group documents: 1.Gap analysis (life-history vital for assessment and management) of Chondrichthyes caught in SA fisheries. 2. MRAIT assessment and selection of 5 priority species per period	Yes	
	Biological sampling (conversion ratios, life-history, genetics) and research related to 5 priority species selected.	3	Biological sampling of prioritized species per fishery sector	Completed scientific reports at relevant scientific and management working groups		
		4	Conduct necessary research (basic life-history required for management) based on samples for priority species	Completed scientific reports at relevant Scientific and		

				Management Working Groups		
	Monitoring catches (landings, observer coverage), web-based catch reporting (recreational)	5	Improve identification of Chondrichthyes caught in fisheries by distributing ID guides to rights holders in major fisheries, observers, compliance, inspectors and Customs	Frequent (TBD) ID courses for each group. Shark ID video instructions to supplement training. Improve communications between units	Yes	
		6	Develop and implement a scientific observer programme that includes land-based and sea-based monitoring with sampling strategy set for sharks. Set targets for monitoring of fin and trunk consignments.	Target strategy presented at relevant Scientific Working Groups (number of sites with effective landing monitoring programs and number of vessels with observers)	Yes	
	Assessment of prioritised species	7	Regular assessments for soupfin and smoothhound sharks as per linefish protocol (Annual abundance indices and assessments every 2-3 years)	Presented at relevant Scientific Working Groups	Yes	
		8	Investigate other data sources suitable for trend analyses through workshops/ calls for data	Distribute calls for data through SANCOR mailing list	Yes	
		9	Risk assessments (JARA) for data deficient chondrichthyan species every 2 years	Presented at Scientific Working Groups of relevance	Yes	

Sustainable management	Develop shark specific discharge, observer regulations across all fisheries	10	Re-establish, re -assess and expand land and sea based scientific observer coverage	Observer programmes established	Yes	
		11	Establish web-based catch recording for recreational fisheries	Web-based recreational catch monitoring and control system implemented	Yes	
		12	Establish additional monitoring requirements for fisheries taking rare, vulnerable - critically endangered species	Monitoring implemented across relevant fisheries	Yes	
	Shark specific regulations in all fisheries (permit conditions, etc.)	13	Review and develop regulatory tools (permit conditions, regulations and policy)	Permits in place, regulations and policies amended	Yes	
		14	Develop and implement management protocols for all fisheries	Management protocols operational for all fisheries	Yes	
		15	Harmonize shark-specific permit conditions across all fisheries	Shark specific permit conditions harmonized	Yes	
		16	Review existing mitigation measures and compare with those used in other regions to develop best practice release protocols for all gear types	Presented at relevant working groups	Yes	
		17	Develop best practice release protocols and incorporate into permit conditions where appropriate	Best practice release protocols incorporated in all relevant permits	Yes	

Optimal use	Optimization of shark products from sustainable fisheries	18	Investigate better utilization of shark carcasses i.e. shark leather, alternative processing of shark meat in non-industrial fisheries etc.	Presented at relevant working groups		
	Develop protocols for ecotoxic species (Concern around health risk of shark meat consumption)	19	Develop research into prioritised commercial species for ecotoxicology and food safety	Presented at scientific working groups of relevance		
	Fisheries vs Tourism (MLRA vs TOPS?)	20	Develop protocols for removing sharks from permitted fisheries retention lists according to standardised criteria	Presented at scientific working groups of relevance	Yes	
	Retained sharks are not fully utilized	21	Develop and apply finning legislation to existing fisheries, include skate wings	Finning legislation applied to existing fisheries and extended to include skates	Yes	
Understanding and Management of threats	Ecosystem threats of related fishing (pollution, gear (ghost),	22	Review and identify fisheries and non-extractive impacts on sharks	Presented at relevant working groups		
		23	Investigate indirect, fisheries-related threats (i.e. post release mortality, plastic strops, etc.)	Advice for mitigation provided		
		24	Develop permit conditions to mitigate against these threats across fisheries	Permits in place, regulations and policies amended		
	IUU	25	Investigate Illegal, Unregulated and Unreported fishing activities	Regular, comprehensive, transparent updates on response to IUU activities provided	Yes	

	Understanding the impact of fishing Chondrichthyes on ecosystems	26	Promote and encourage research that investigates the impacts of fishing Chondrichthyes on ecosystems. Link to BMP	Scientific report or published paper	Yes	
	Spatial management and protection against fishery impacts (MPAs?)	27	Review existing protection for Chondrichthyes in MPAs.	List and quantification of Chondrichthyes occurring in each MPA	Yes	
		28	Develop a spatial conservation plan for Chondrichthyes	Shark Biodiversity Management Plan updated, reviewed and implemented	Yes	
		29	Promoting and encourage research that investigates the effectiveness of spatial protection	Scientific report or published paper	Yes	
Co-ordination, stakeholder engagement and communication	Education and awareness	30	Determine requirements for educational material at various levels (school, tertiary, public etc.).	Educational material provided at relevant level	Yes	
		31	Implement training on Shark identification (including fin, fillet, chain of custody)	Number of courses, number of staff trained		
		32	Develop responsible fisheries programs pertaining to sharks	Awareness programme rolled out to fishing community		
	Internal coordination within the Department	33	Coordination across Scientific Working Groups at DFFE: Fisheries Research and with DFFE: Oceans and Coasts	Scientists integrated across Branches. Regular research Indabas.	Yes	

		34	Close coordination between science, management and enforcement	Increase in transparency of decisions. Scientific advice is acknowledged on reception. Deviations from advice are substantiated and documented in writing. Implementation of scientific advice is fed back to science and enforcement groups. Science to policy loop completed in one year.	Yes	
		35	Coordination of assistance of enforcement activities	Number of affidavits and cross sectional groups established.	Yes	
	Coordination among agencies	36	Formal use of the South African Seafood Naming standards in all permitting documents (exports, sale, transport, etc.)	Only official names and scientific names used for relevant documentation schemes (exports, imports, sale and transport)	Yes	
		37	Relevant stakeholders are incorporated in scientific and management fisheries working groups	Stakeholders integrated into relevant working groups	Yes	
	Communication	38	Develop mechanism to share new developments related to research, management and conservation of sharks	Rapid and frequent communication on new research, management and conservation efforts	Yes	
		39	Roll out regular, transparent means of communication with stakeholders. Rapid response to incorrect and	Number of responses produced within agreed time frame. Close communication lines	Yes	

			misleading media content. Timeous and comprehensive response to queries from stakeholders, including journalist, conservation agencies and fishers.			
		40	Review of communication by means of modern technology (i.e. social media, electronic publication etc.)	Social media strategy developed and implemented		
	Explore funding opportunities	41	Explore funding opportunities through local and international agencies.	Additional funding sources established		