



Conservation and management of chondrichthyans (sharks, rays and chimaeras) in the Western Indian Ocean

Nairobi Convention, Science to Policy Meeting
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Rhett Bennett

rbennett@wcs.org

Wildlife Conservation Society



**Wildlife
Conservation
Society**

PARTNERS AND FUNDERS

Amie Bräutigam
Markus Bürgener
Alison Clausen
Jeremy Kiszka
Christelle Razafindrakoto
Anabelle Bladon
Ruth Leeney
Nicola Okes
Ravaka Ranaivoson
Nyawira Muthiga
Chico Birrell
Anthony Bernard
Sarah Markes
Magreth Kasuga
Tim Davenport



INDIAN OCEAN
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BACKGROUND TO ISSUE



130



86



11







Mike Markovina



Mike Markovina



Dareen Almojil



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© OCEANA / LX Blue sharks (*Prionace glauca*) in the fresh market in Vigo, Spain. Sharks campaign. September 2006.

© OCEANA / Keith Ellenbogen French purse seiner Gerard Luc III rolling up the net with a bluefin tuna in the south of Formentera, Balearic Island, Spain. MarViva Med Mediterranean Expedition. June 2008.

Cerquero francés Gerard Luc III recuperando la red con un atún rojo al sur de Formentera, Islas Baleares, España. Expedición por el Mediterráneo del MarViva Med. Junio 2008

Tiburones azules (*Prionace glauca*) en la lonja de Vigo, España. Campaña de tiburones. Septiembre 2006



Dareen Almojil



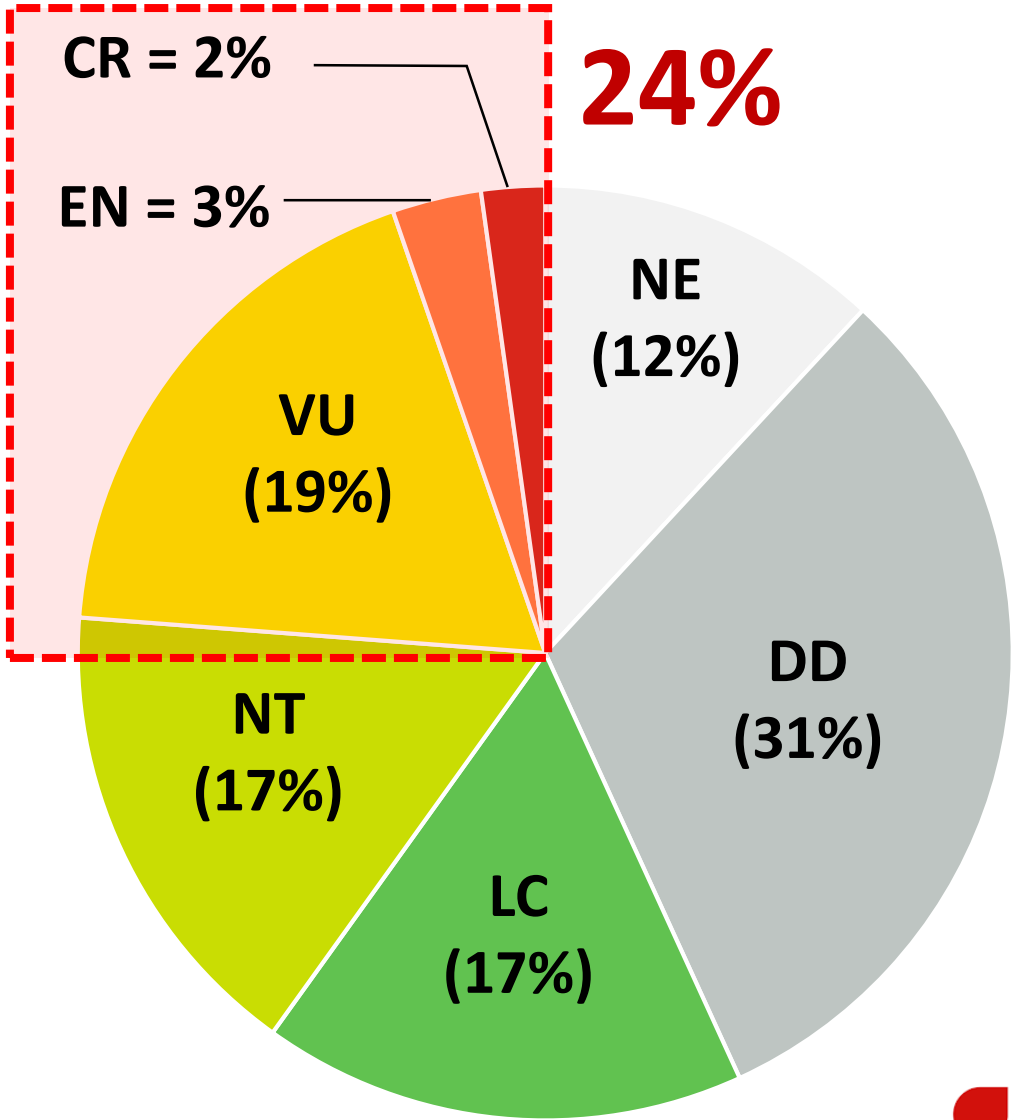
Sea Sheppard



Mike Markovina



IUCN Red List Categories



Mike Markovina



Dareen Almojil

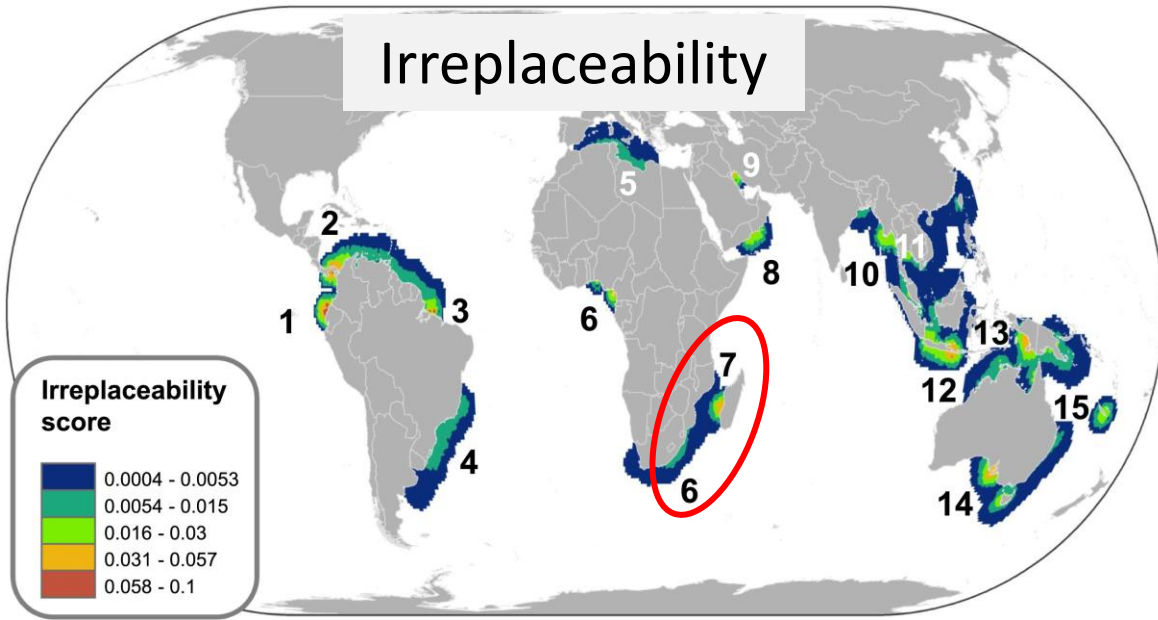


<http://www.iucnredlist.org/>

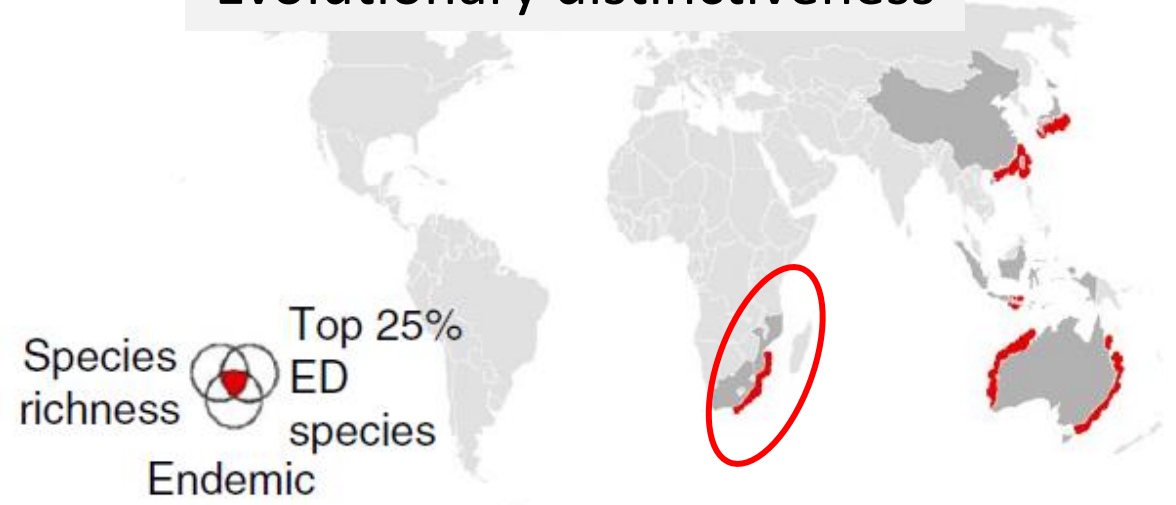
Sea Sheppard



Irreplaceability

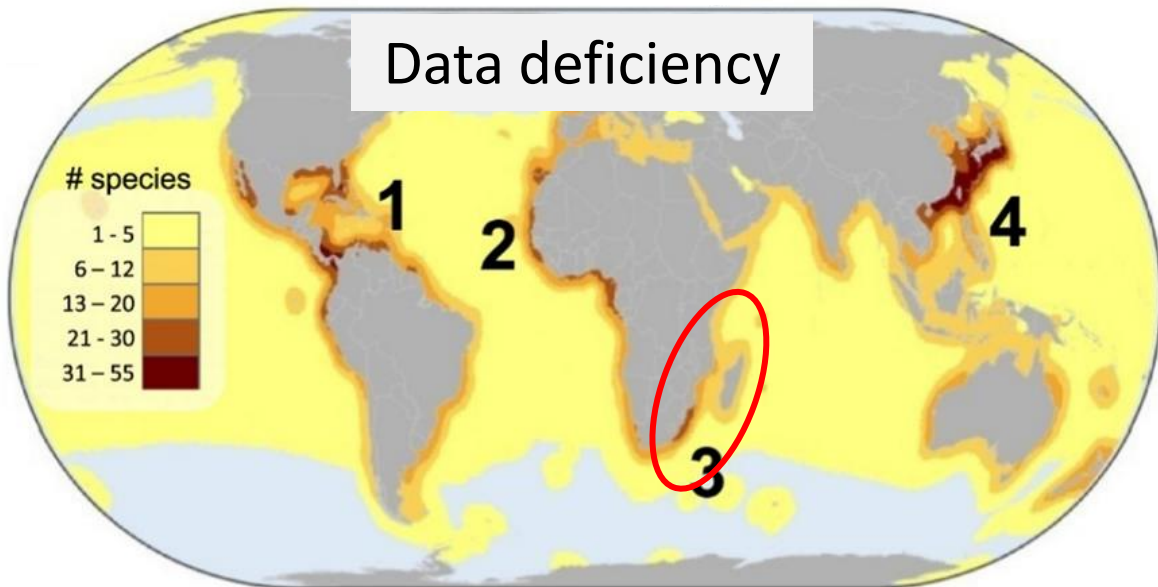


Evolutionary distinctiveness



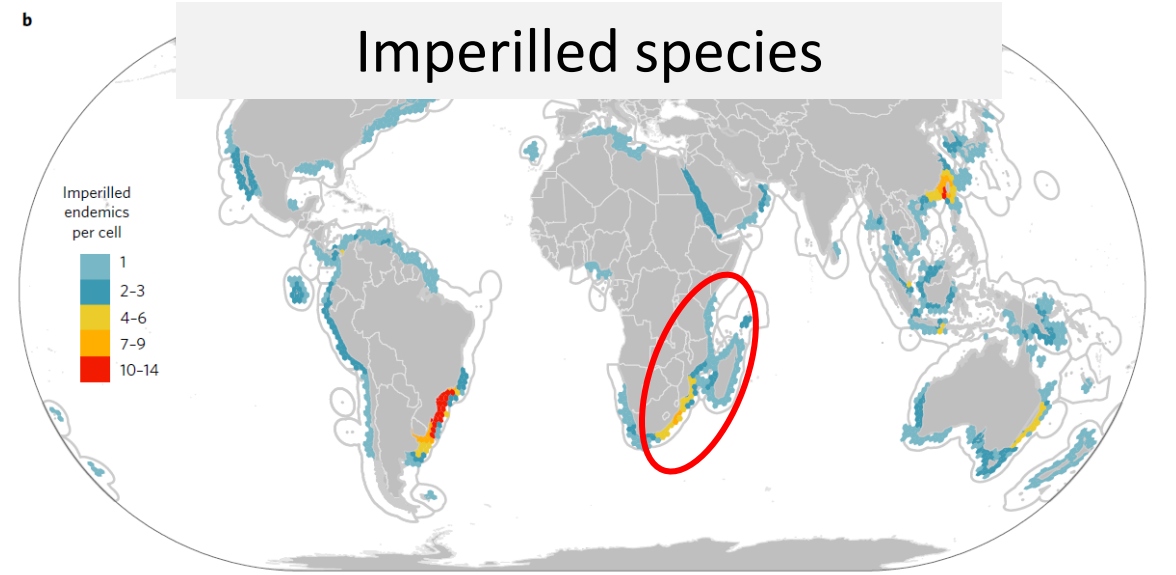
From Stein et al. (2018) *Nature, Ecology & Evolution* **2**: 288–298

Data deficiency



Adapted from Dulvy et al. (2014) *eLife*: DOI: [10.7554/eLife.00590](https://doi.org/10.7554/eLife.00590)

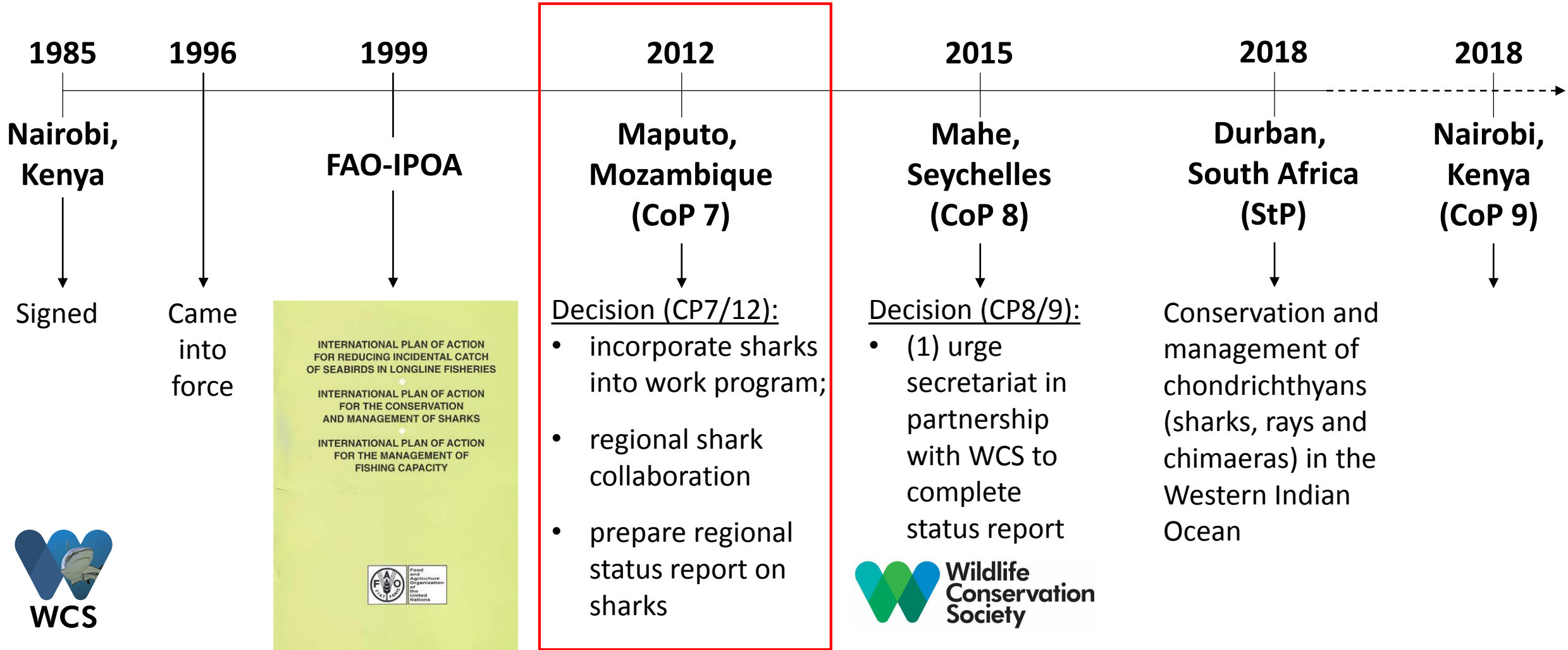
Imperilled species



Davidson & Dulvy (2017) *Nature, Ecology & Evolution*: DOI: [10.1038/s41559-016-0040](https://doi.org/10.1038/s41559-016-0040)

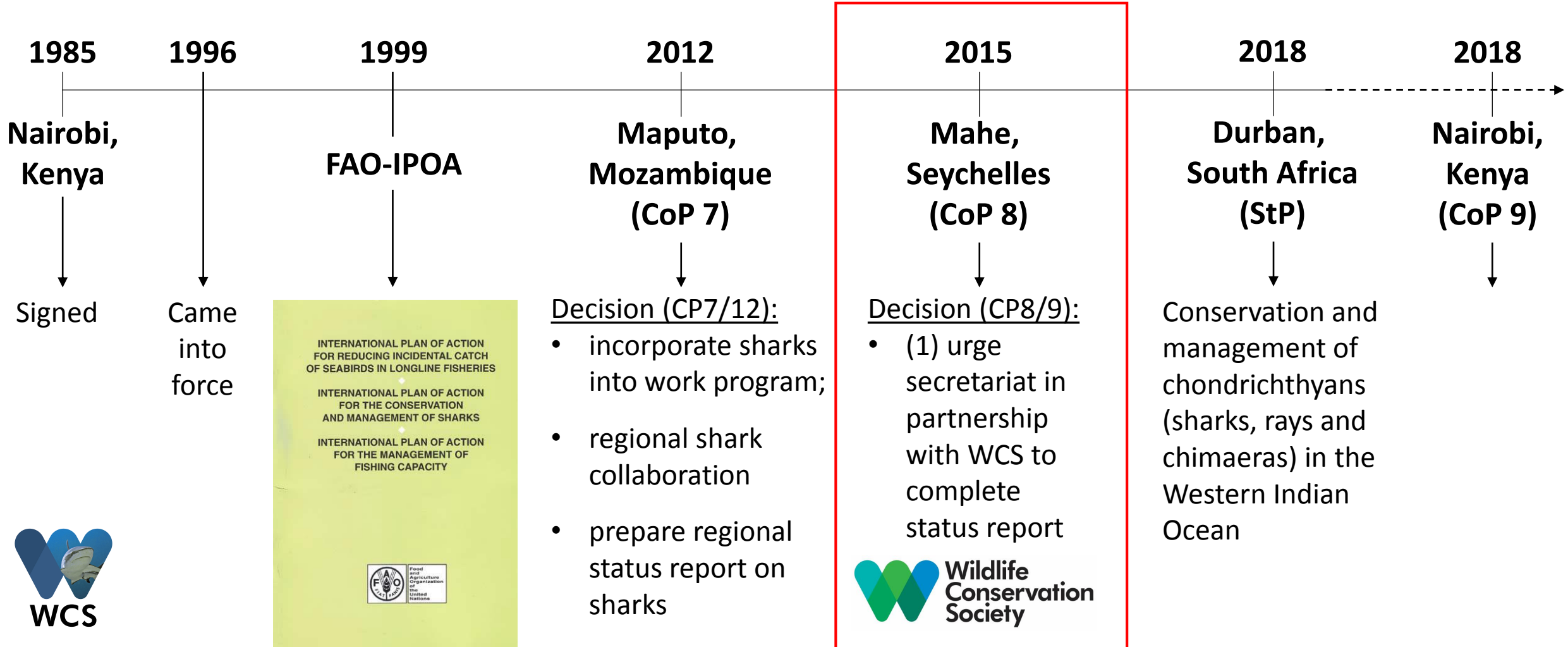


SHARKS IN THE NAIROBI CONVENTION



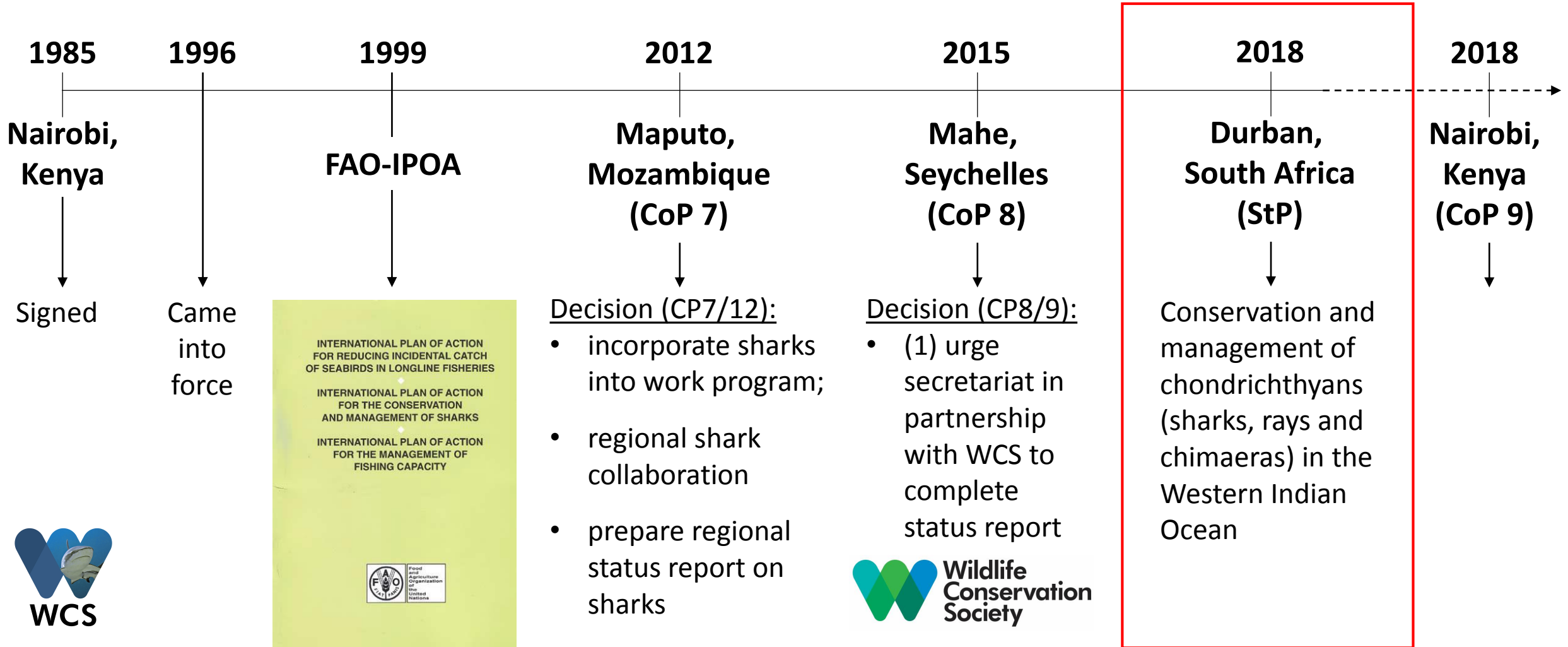


SHARKS IN THE NAIROBI CONVENTION





SHARKS IN THE NAIROBI CONVENTION



REGIONAL STATUS REPORT - AIMS

- Analyze fisheries, trade, management status and gaps at national and regional levels
- Document successes, constraints, and priority needs
- Provide suggestions for improved management and sustainable fisheries for sharks and rays
- Propose policy recommendations for consideration at NC CoP
- Propose species for consideration for listing on Annexes of Convention Protocol





- 6 authors
- 16 contributors
- 19 organisations
- 3 years
- 10 countries
- 340 page report



WCS

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the wildlife trade monitoring network

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REGIONAL STATUS REPORT - FINDINGS

- Fisheries for and trade in chondrichthyans throughout the region
- Major gaps in knowledge: species status, fisheries, trade
- Poor species-level monitoring/recording: 'sharks, rays, skates, etc. nei'
- Landings in artisanal fisheries poorly documented in most countries
- Fisheries and trade controls vary across region and incomplete in most countries
- Little legislation for or including chondrichthyans
- Few measures to limit fishing and fishing mortality
- Numerous constraints to improved management:
 - e.g. lack of capacity, inadequate knowledge and political will

SPECIES LISTING ON CONVENTION ANNEXES

Protocol concerning protected areas and wild fauna and flora in the Eastern African region

Annex I – Protected species of wild flora

Not applicable to chondrichthyans

Annex II: Species of wild fauna requiring special protection

Article 4 states: ““The Contracting Parties shall take all appropriate measures to ensure the strictest protection of the endangered wild fauna species listed in annex II.”

- **Criteria: IUCN CR or EN; CMS Appendix I, CITES Appendix I, IOTC prohibited**
- **13 shark and 13 batoid species**

Annex III: Harvestable species of wild fauna requiring protection

Article 5 states: “The Contracting Parties shall take all appropriate measures to ensure the protection of the depleted or threatened wild fauna species listed in annex III. Any exploitation of such wild fauna species shall be regulated in order to restore and maintain the populations at optimum levels.”

- **Criteria: IUCN VU or NT; CMS Appendix II, CITES Appendix II**
- **46 shark and 22 batoid species**

Annex IV: Protected migratory species

Article 6 states: “The Contracting Parties shall, in addition to the measures specified in articles 3, 4 and 5, co-ordinate their efforts for the protection of migratory species listed in annex IV whose range extends into their territories. ”

- **UNCLOS Annex I; Fowler, S. 2014. *The Conservation Status of Migratory Sharks.***
- **43 shark and 23 batoid species**

Table 1: Species recommended for listing on Nairobi Convention Annex II, based on their listing on the IUCN Red List of Threatened Species as Critically Endangered (IUCN CR) or Endangered (IUCN EN), CMS Appendix I (CMS I), CITES Appendix I (CITES I) or as IOTC prohibited species (IOTC).

FAMILY	SPECIES	COMMON NAME	REFERENCE	IUCN RED LIST	Criteria for listing on Annex II
Sharks					
Alopiidae	<i>Alopias pelagicus</i> ^a	pelagic thresher shark	Nakamura, 1935	VU	IOTC
Alopiidae	<i>Alopias superciliosus</i> ^a	bigeye thresher shark	Lowe, 1841	VU	IOTC
Alopiidae	<i>Alopias vulpinus</i> ^a	common thresher shark	(Bonnaterre, 1788)	VU	IOTC
Carcharhinidae	<i>Carcharhinus longimanus</i> ^b	oceanic whitetip	(Poey, 1861)	VU	IOTC
Cetorhinidae	<i>Cetorhinus maximus</i>	basking shark	(Gunnerus, 1765)	VU	CMS I
Lamnidae	<i>Carcharodon carcharias</i>	great white shark	(Linnaeus, 1758)	VU	CMS I
Rhincodontidae	<i>Rhincodon typus</i> ^c	whale shark	Smith, 1828	EN	IUCN EN; CMS I
Scyliorhinidae	<i>Haploblepharus kistnasamyi</i>	Natal shyshark	Human & Compagno, 2006	CR	IUCN CR
Scyliorhinidae	<i>Holohalaelurus favus</i>	honeycomb izak	Human, 2006	EN	IUCN EN
Scyliorhinidae	<i>Holohalaelurus punctatus</i>	whitespotted izak	(Gilchrist, 1914)	EN	IUCN EN
Sphyrnidae	<i>Sphyrna lewini</i>	scalloped hammerhead	(Griffith & Smith, 1834)	EN	IUCN EN
Sphyrnidae	<i>Sphyrna mokarran</i>	great hammerhead	(Rüppell, 1837)	EN	IUCN EN
Stegostomatidae	<i>Stegostoma fasciatum</i>	zebra shark	(Hermann, 1783)	EN	IUCN EN
Batoids (rays, skates, wedgefishes, sawfishes)					
Mobulidae	<i>Mobula alfredi</i>	reef manta ray	(Krefft 1868)	VU	CMS I
Mobulidae	<i>Mobula birostris</i>	giant manta ray	(Walbaum 1792)	VU	CMS I
Mobulidae	<i>Mobula kuhlii</i>	shortfin devil ray	(Valenciennes, 1841)	DD	CMS I
Mobulidae	<i>Mobula mobular</i>	giant devil ray	(Bonnaterre, 1788)	EN	IUCN EN; CMS I
Mobulidae	<i>Mobula tarapacana</i>	sicklefin devilray	(Philippi, 1892)	VU	CMS I
Mobulidae	<i>Mobula thurstoni</i>	bentfin devil ray	(Lloyd, 1908)	NT	CMS I
Myliobatidae	<i>Aetomylaeus vespertilio</i>	ornate eagle ray	(Bleeker, 1852)	EN	IUCN EN
Narkidae	<i>Electrolux addisoni</i>	ornate sleeper ray	Compagno & Heemstra, 2007	CR	IUCN CR
Pristidae	<i>Pristis clavata</i>	dwarf sawfish	Garman, 1906	EN	IUCN EN; CMS I, CITES I
Pristidae	<i>Pristis pectinata</i>	smalltooth sawfish	Latham, 1794	CR	IUCN CR; CMS I; CITES I
Pristidae	<i>Pristis pristis</i>	largetooth sawfish	(Linnaeus, 1758)	CR	IUCN CR; CMS I; CITES I
Pristidae	<i>Pristis zijsron</i>	green sawfish	Bleeker, 1851	CR	IUCN CR; CMS I; CITES I
Rajidae	<i>Rostroraja alba</i>	spurnose skate	(Lacepède, 1803)	EN	IUCN EN

^a IOTC Resolution 12/09 (<http://www.iotc.org/cmm/resolution-1209-conservation-thresher-sharks-family-alopiidae-caught-association-fisheries-iotc>) "Fishing Vessels flying the flag of an IOTC Member or Cooperating Non-Contracting Party (CPCs) are prohibited from retaining on board, transshipping, landing, storing, selling or offering for sale any part or whole carcass of thresher sharks of all the species of the family Alopiidae"

^b IOTC Resolution 13/06 (<http://www.iotc.org/cmm/resolution-1306-scientific-and-management-framework-conservation-sharks-species-caught>) "CPCs shall prohibit, as an interim pilot measure, all fishing vessels flying their flag and on the IOTC Record of Authorised Vessels, or authorised to fish for tuna or tuna-like species managed by the IOTC on the high seas to retain onboard, tranship, land or store any part or whole carcass of oceanic whitetip sharks"

^c IOTC Resolution 13/05 (<http://www.iotc.org/cmm/resolution-1305-conservation-whale-sharks-rhincodon-typus>) CPC's "shall prohibit their flagged vessels from intentionally setting a purse seine net around a whale shark in the IOTC area of competence, if it is sighted prior to the commencement of the set" and that "in the event that a whale shark is unintentionally encircled in the purse seine net, the master of the vessel shall: a) take all reasonable steps to ensure its safe release"

ROADMAP FOR CONSERVATION AND MANAGEMENT

Regional Technical Workshop on Sharks and Rays of the Southwest Indian Ocean: Status Review and Development of a Roadmap for Conservation and Management

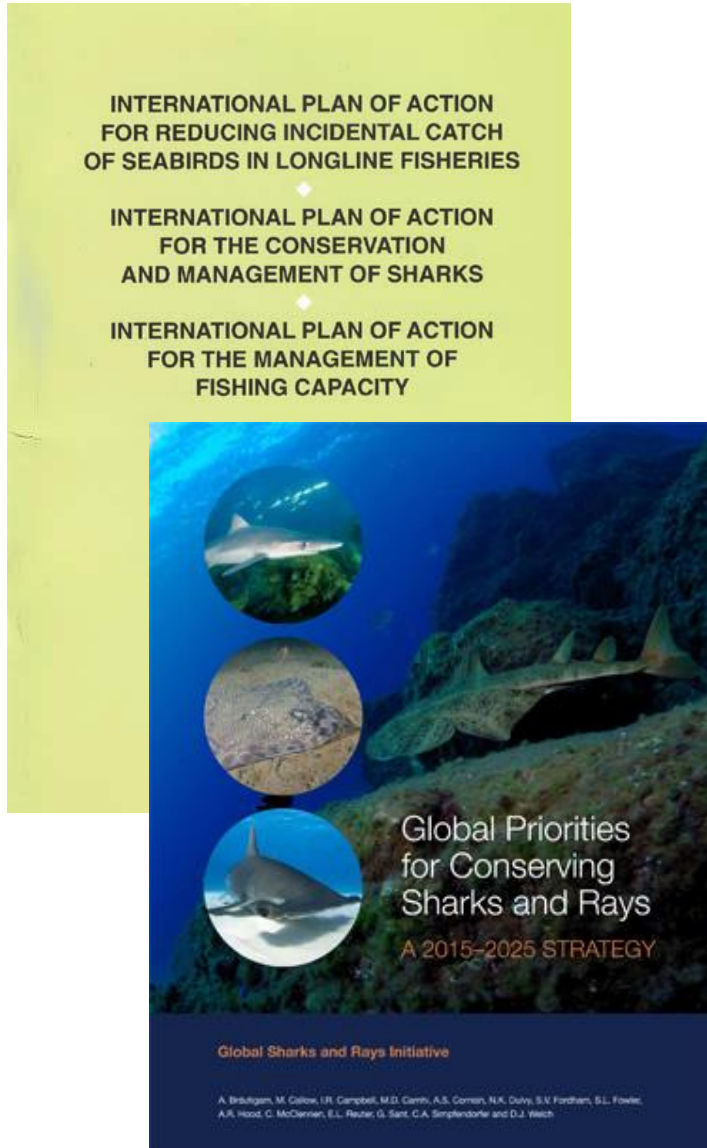


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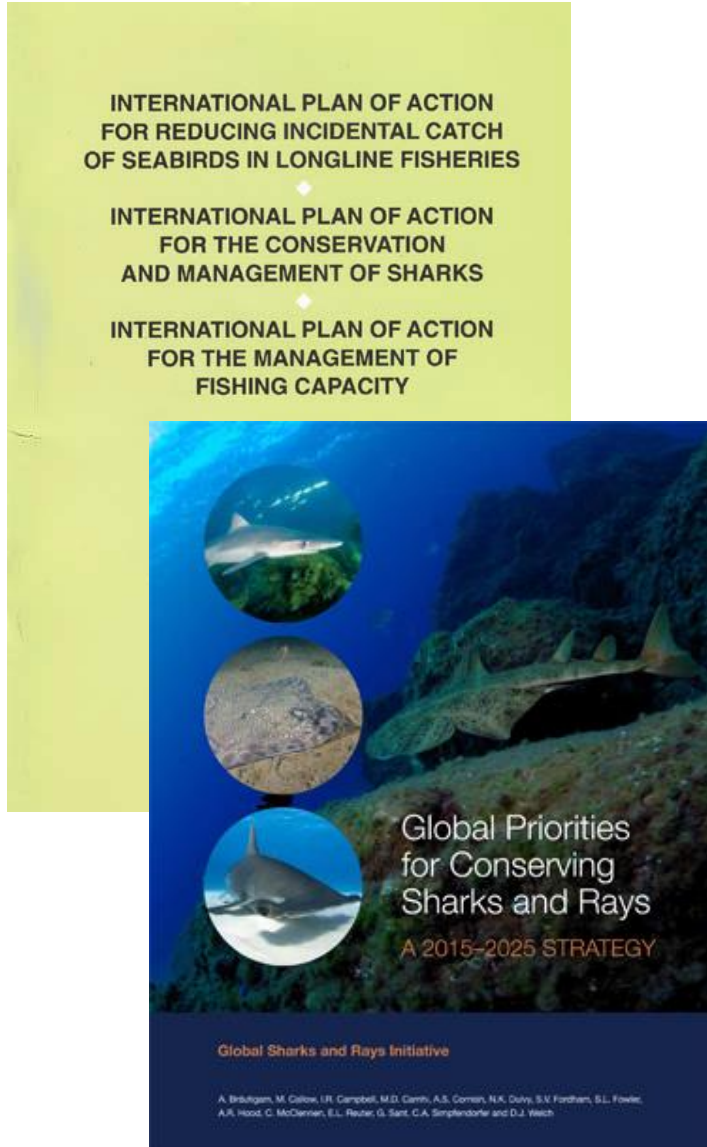


TRAFFIC
the wildlife trade monitoring network

Advancing the development of a regional roadmap for the conservation and management of sharks and rays in the Southwest Indian Ocean



ROADMAP FOR CONSERVATION AND MANAGEMENT



Roadmap Objectives

- Improve data collection, reporting and use
- Strengthen policy/legislation
- Reinforce management and conservation measures
- Strengthen national and regional capacity
- Improve compliance and enforcement
- Improve awareness-raising and communication

LINKS TO NC WORK PROGRAMME/THEMES

26. Assessments and Capacity Building:

“The main objective of the activities under this theme is to create better understanding and knowledge of the coastal and marine environment to strengthen linkages between ecosystems assessment and reporting mechanisms for informed planning and decision-making processes.”

*The **Regional Status Report** provides knowledge on chondrichthyan populations, threats, needs – for informed decision making.*

27. Management:

“The main objective of activities under this theme is the effective management, sustainable use and protection of the marine and coastal environment of the Western Indian Ocean region.”

*The **Regional Status Report, Regional Roadmap** and **Proposed Species Listings** on the NC annexes are aimed directly at improved management, sustainable use and protection of the resources.*

28. Coordination and legal aspects:

“The main objective of the activities under this theme is to strengthen the coordination structure within the Nairobi Convention for strengthened governance frameworks for the sustainable management of marine and coastal ecosystems including transboundary ecosystems. This focuses on implementing and updating existing Nairobi Convention protocols and developing new protocols.”

*The **Proposed Species Listing** aims to update the current annexes; while the **Regional Roadmap** provides new guiding document for chondrichthyan conservation and management, thereby strengthening governance structure.*

RECOMMENDATIONS FOR NC MEMBER STATES

- Continue to promote/support/facilitate research and conservation efforts for sharks and rays in their country
- Endorse national chapter of regional status report or conduct shark assessment report to identify needs/gaps to guide policy, management and conservation actions
- Develop national roadmap and/or plan of action (according to FAO IPOA-Sharks) for sharks and rays
- Strengthen monitoring of chondrichthyan fisheries and trade, including species-level data (particularly artisanal)
- Adopt management and conservation measures to reduce/limit targeted mortality and bycatch of sharks/rays
- Mitigate against IUU fishing
- Develop appropriate national legislation for sharks/rays (including legal protection for IUCN CR and EN species)
- Ensure appropriate national legislation for important shark/ray habitats
- Ensure suitable management at national level of species listed on NC Annexes (legislation/full protection)
- Improve compliance with and enforcement of regulations
- Introduce stricter trade controls and improve enforcement thereof
- Improve national capacity (assessment, data collection, enforcement, resources) to allow above actions
- Improve/raise awareness of these issues among fishers, governments and other stakeholders
- Ratify conventions not yet signatory to – such as PSMA, CMS , CITES

RECOMMENDATIONS FOR NC AT REGIONAL LEVEL

- Promote reduction of fishing pressure, fishery-related mortality and bycatch of chondrichthyan species
- Retain chondrichthyan in NC work programme (**Decision CP7/12**) and continue to support / facilitate research and conservation efforts for sharks and rays in the region (including promoting collaboration) (**Decision CP7/12**)
- Endorse *Regional Status Report* as formal Shark Assessment Report for NC region (**Decision CP7/12, CP8/9.1**)
- Raise awareness among fishers, governments and other stakeholders of the poor conservation status of chondrichthyan species in the WIO, their important ecological role, the impacts of overfishing and the need for chondrichthyan conservation
- Formalise *Regional Roadmap* as guiding document, for shark and ray conservation and management in the WIO, and encourage NCMSs to develop national roadmaps for conservation and management of chondrichthyan
- Develop Regional Plan of Action for conservation and management of sharks (FAO IPOA-Sharks)
- Consider (and regularly revise) recommendations for listing of chondrichthyan species that require stricter management or warrant full protection, under the annexes of the Nairobi Convention *Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region*
- Implement stricter trade controls and improved monitoring, reporting and enforcement, in the trade in chondrichthyan products both within and out of the WIO
- Engage with regional and international conventions, commissions and RFMOs (e.g CMS, CITES, IOTC, SWIOFC), to improve implementation, capacity and control in trade, particularly of threatened and migratory species
- Promote uptake of regional conventions and agreements by NCMSs (for example PSMA)



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Contact: rbennett@wcs.org
www.wcs.org

PARTNERS AND FUNDERS

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Ecological surveys - Baited remote underwater video (BRUV)

Neotrygon caeruleopunctatus

NE

Acroteriobatus leucospilus

DD

Rhina ancylostoma

VU

Carcharhinus amblyrhynchos

NT

Loxodon macrorhinus

LC

Pseudoginglymostoma brevicaudatum

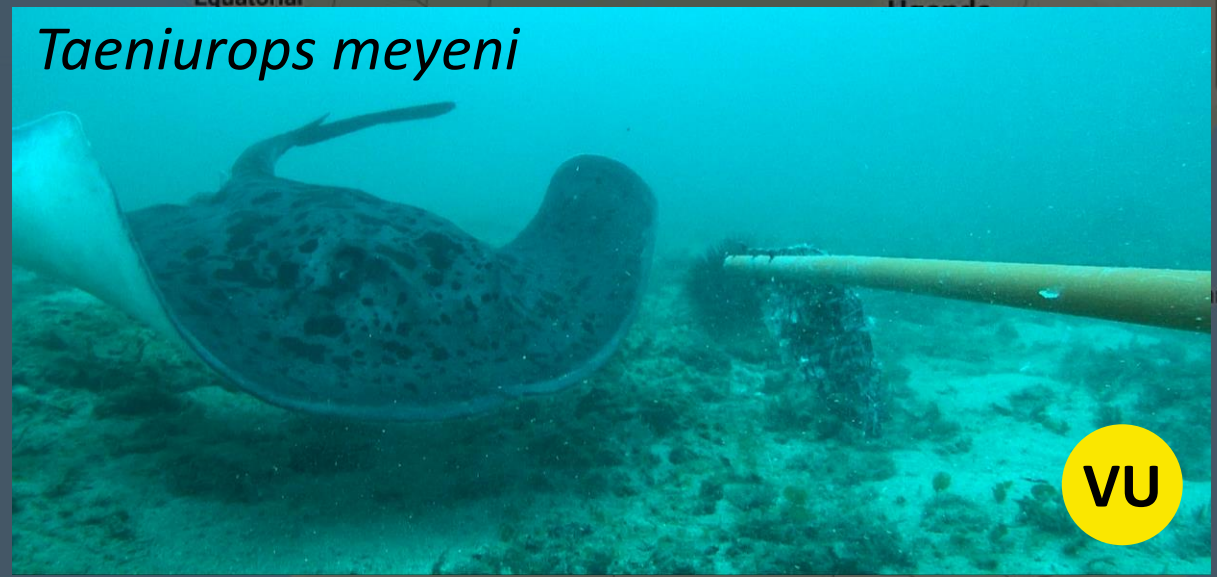
VU

Negaprion acutidens

VU

Ecological surveys - Baited remote underwater video (BRUV)

Taeniurops meyeri



VU

Pateobatis fai



VU

Himantura uarnak



VU

Acroteriobatus leucospilus



DD

Fish market surveys

All photos:
Magreth Kasuga/WCS

Mustelus mosis



DD

Pristiophorus nancyae

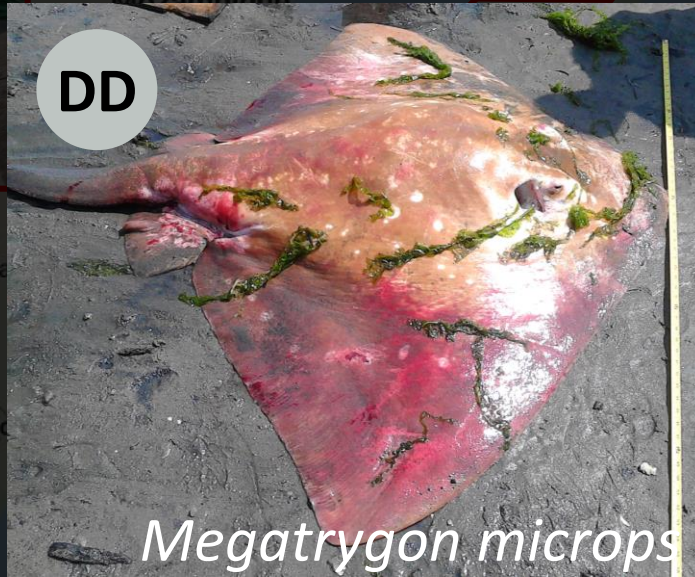


NE



VU

Rhina ancylostoma



DD

Megatrygon microps



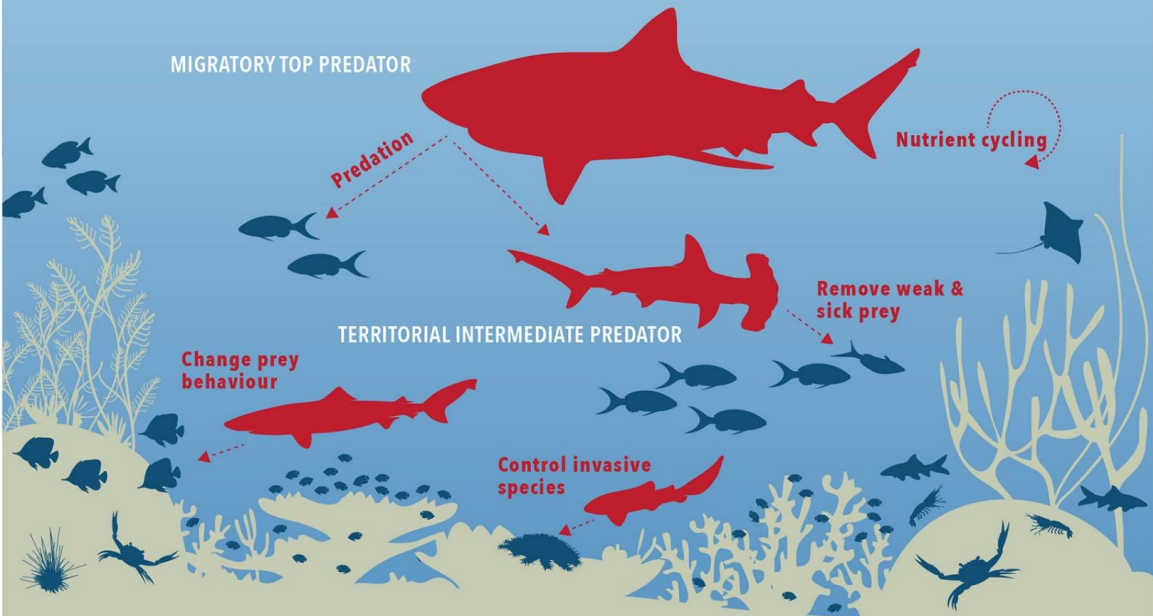
EN

Aetomylaeus vespertilio

Raising awareness

THE IMPORTANCE OF SHARKS FOR CORAL REEFS

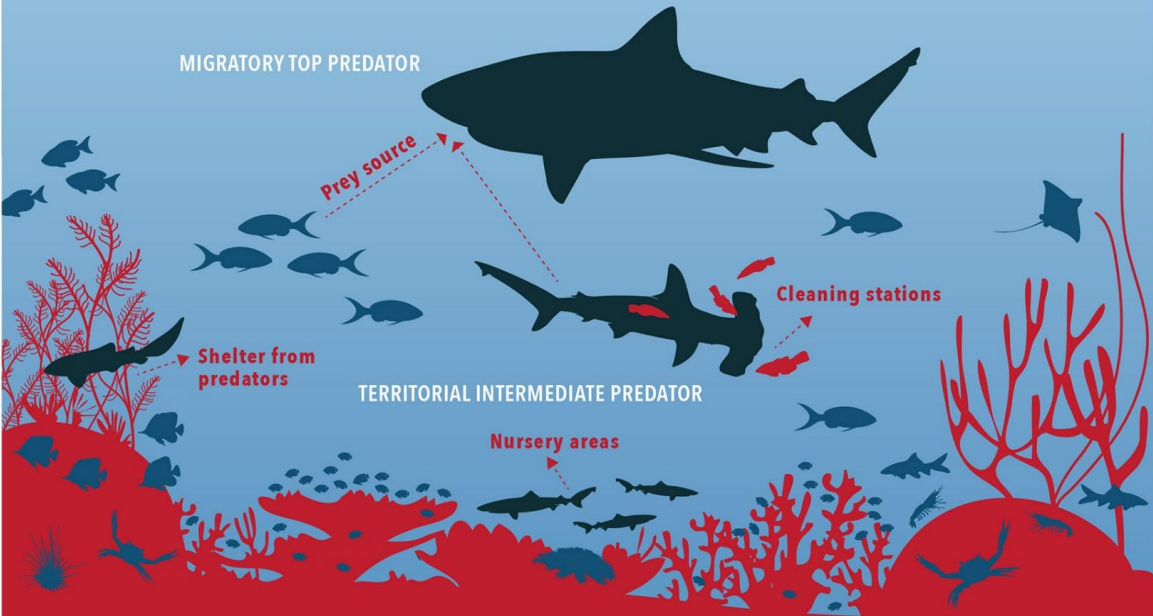
Sharks benefit coral reef ecosystems by maintaining food webs and fish stocks, cycling nutrients, reducing disease and regulating invasive species.



Inspired by 'The Ecological Role of Sharks on Coral Reefs', Roff et al. (2016) TREE vol 31(5)

IMPORTANCE OF CORAL REEFS FOR SHARKS

Coral reefs benefit sharks by creating habitat for their food, providing shelter from predators, cleaning stations and nurseries for their young

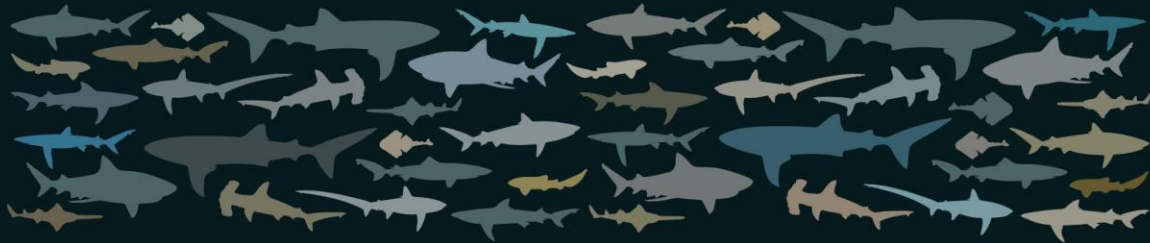


Inspired by 'The Ecological Role of Sharks on Coral Reefs', Roff et al. (2016) TREE vol 31(5)

Raising awareness

TANZANIA'S SHARKS IN DANGER

Sharks are APEX PREDATORS and play an essential role in maintaining a healthy marine ecosystem



47 species of sharks have been recorded in TANZANIAN waters
 SPARSE DATA available shows the majority of these species are IN DANGER

According to the IUCN Red List 2016

70% of these species are **THREATENED**



WCS TANZANIA

Given the URGENT need for data on Tanzania's shark populations and understanding of the benefits of protecting them, WCS is working on RESEARCH, POLICY DEVELOPMENT AND AWARENESS RAISING at community, local and national levels.



SHARKS ARE ESSENTIAL FOR A HEALTHY MARINE ECOSYSTEM

Sharks are APEX PREDATORS

They are at the top of the marine food chain, and therefore **REGULATE THE BALANCE** of other species' populations within the ecosystem. Maintaining the right proportions of species populations keeps the environment healthy.

Sharks are KEYSTONE SPECIES

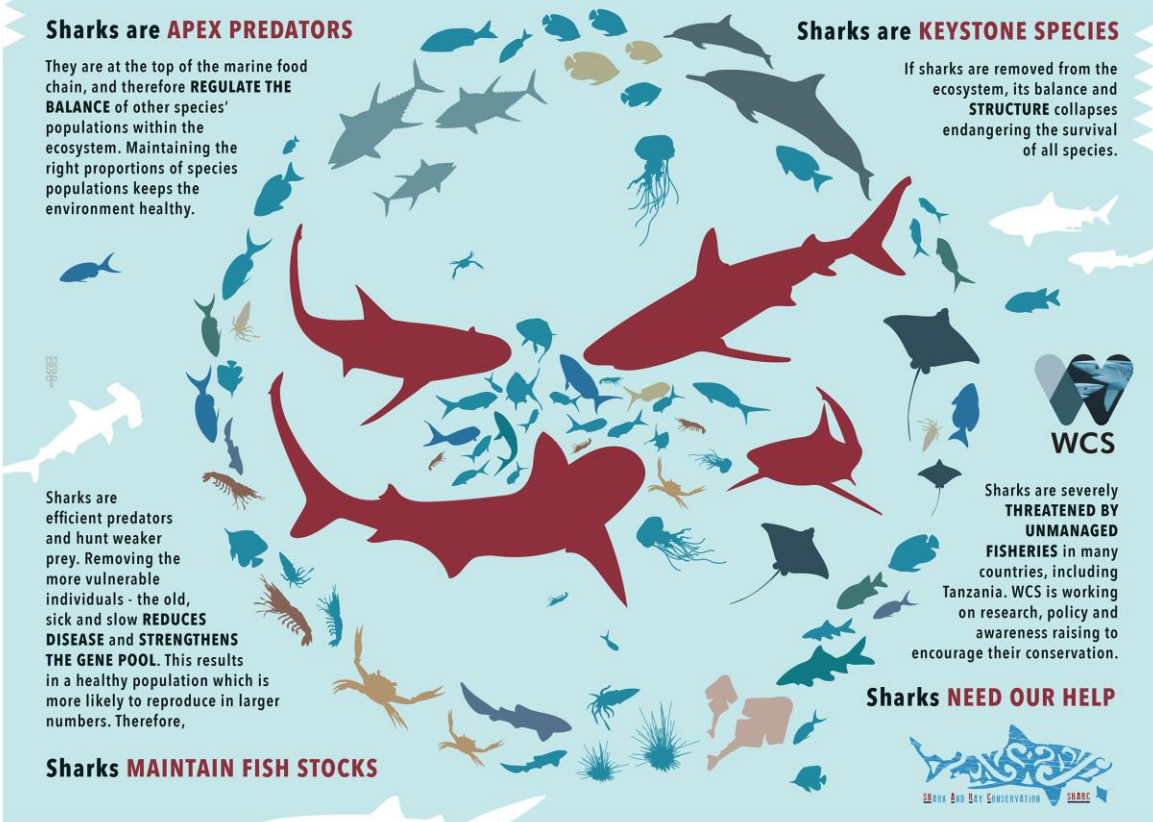
If sharks are removed from the ecosystem, its balance and **STRUCTURE** collapses endangering the survival of all species.

Sharks are efficient predators and hunt weaker prey. Removing the more vulnerable individuals - the old, sick and slow **REDUCES DISEASE** and **STRENGTHENS THE GENE POOL**. This results in a healthy population which is more likely to reproduce in larger numbers. Therefore,

Sharks **MAINTAIN FISH STOCKS**

Sharks are severely **THREATENED BY UNMANAGED FISHERIES** in many countries, including Tanzania. WCS is working on research, policy and awareness raising to encourage their conservation.

Sharks **NEED OUR HELP**



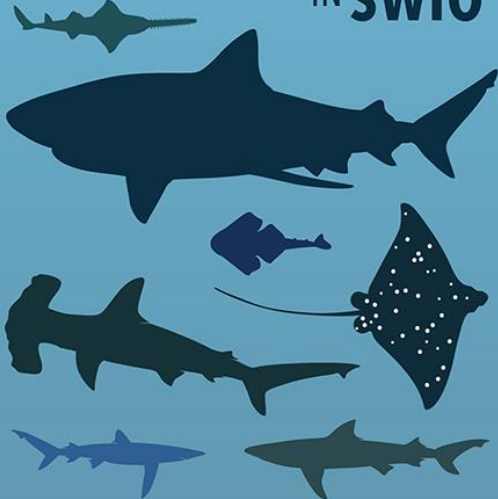
Raising awareness

SHARKS & RAYS IN THE SOUTHWEST INDIAN OCEAN

The southwest Indian Ocean (SWIO) is one of the last global strongholds for sharks and rays



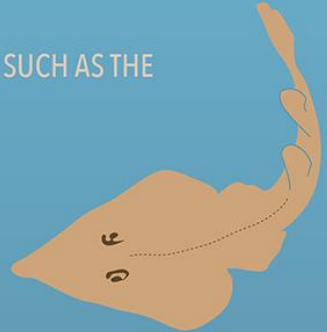
AT LEAST **211** SPECIES OF
SHARKS & RAYS
IN SWIO



25% OF
GLOBAL
SPECIES



56 SPECIES ARE
ENDEMIC
TO THE SWIO



SUCH AS THE

ZANZIBAR GUITARFISH

AT LEAST **25%**
OF THESE SPECIES ARE
THREATENED
BY



WCS is working to protect sharks and rays throughout the SWIO region

