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

Nairobi Convention, Science to Policy Meeting
10th July 2018, Durban, South Africa

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Chico Birrell
Anthony Bernard
Sarah Markes
Magreth Kasuga
Tim Davenport

PARTNERS AND FUNDERS
BACKGROUND TO ISSUE

- Comoros
- Seychelles
- Mauritius
- French IOT
- Magreth Kasuga/WCS
- Iain Jones

Seychelles

11

130

86


Caine Delacy
The IUCN Red List Categories include:

- **CR** (Critically Endangered): 2%
- **EN** (Endangered): 3%
- **DD** (Data Deficient): 31%
- **VU** (Vulnerable): 19%
- **NT** (Near Threatened): 17%
- **LC** (Least Concern): 17%
- **NE** (Not Evaluated): 12%

For more information, visit [http://www.iucnredlist.org/](http://www.iucnredlist.org/).
Irreplaceability

Evolutionary distinctiveness

Data deficiency

Imperilled species

Adapted from Dulvy et al. (2014) *eLife* DOI: 10.7554/eLife.00590


SHARKS IN THE NAIROBI CONVENTION

1985
Nairobi, Kenya
Signed

1996
came into force

1999
FAO-IPOA

2012
Maputo, Mozambique (CoP 7)
Decision (CP7/12):
• incorporate sharks into work program;
• regional shark collaboration
• prepare regional status report on sharks

2015
Mahe, Seychelles (CoP 8)
Decision (CP8/9):
• (1) urge secretariat in partnership with WCS to complete status report

2018
Durban, South Africa (StP)
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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
REGIONAL STATUS REPORT

- Analyze fisheries, trade, management status and gaps at national and regional level
- Document successes, constraints, and priority needs
- Provide suggestions for operationalizing linkages between environment and fisheries sectors around sharks and rays
- Propose recommendations for consideration at 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
REGIONAL STATUS REPORT - FINDINGS

- Fisheries for and trade in chondrichthians 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 chondrichthians
- 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>
<thead>
<tr>
<th>FAMILY</th>
<th>SPECIES</th>
<th>COMMON NAME</th>
<th>REFERENCE</th>
<th>IUCN RED LIST</th>
<th>Criteria for listing on Annex II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sharks</strong></td>
<td>Alopiidae</td>
<td>Alopias pelagicus *</td>
<td>pelagic thresher shark</td>
<td>Nakamura, 1935</td>
<td>VU</td>
</tr>
<tr>
<td></td>
<td>Alopiidae</td>
<td>Alopias superciliosus *</td>
<td>bigeye thresher shark</td>
<td>Lowe, 1841</td>
<td>IOTC</td>
</tr>
<tr>
<td></td>
<td>Alopiidae</td>
<td>Alopias vulpinus *</td>
<td>common thresher shark</td>
<td>(Bonnaterre, 1788)</td>
<td>VU</td>
</tr>
<tr>
<td></td>
<td>Carcharhinidae</td>
<td>Carcharhinus longimanus *</td>
<td>oceanic whitetip</td>
<td>(Poey, 1861)</td>
<td>VU</td>
</tr>
<tr>
<td></td>
<td>Cetorhinidae</td>
<td>Cetorhinus maximus</td>
<td>basking shark</td>
<td>(Gunnerus, 1765)</td>
<td>VU</td>
</tr>
<tr>
<td></td>
<td>Lamnidae</td>
<td>Carcharodon carcharias</td>
<td>great white shark</td>
<td>(Linnaeus, 1758)</td>
<td>EN</td>
</tr>
<tr>
<td></td>
<td>Rhincodonidae</td>
<td>Rhincodon typus *</td>
<td>whale shark</td>
<td>Smith, 1828</td>
<td>VU</td>
</tr>
<tr>
<td></td>
<td>Scyliorhinidae</td>
<td>Hexanchus kensilis</td>
<td>sawshark</td>
<td>(Valenciennes, 1841)</td>
<td>DD</td>
</tr>
<tr>
<td></td>
<td>Scyliorhinidae</td>
<td>Holocephalus ferox</td>
<td>dogfish</td>
<td>(Valenciennes, 1841)</td>
<td>VU</td>
</tr>
<tr>
<td></td>
<td>Scyliorhinidae</td>
<td>Holocephalus punctatus</td>
<td>dogfish</td>
<td>(Valenciennes, 1841)</td>
<td>DD</td>
</tr>
<tr>
<td></td>
<td>Sphyridae</td>
<td>Sphyra lewini</td>
<td>scalloped hammerhead</td>
<td>(Griffith &amp; Smith, 1834)</td>
<td>EN</td>
</tr>
<tr>
<td></td>
<td>Sphyridae</td>
<td>Sphyra mokarran</td>
<td>great hammerhead</td>
<td>(Rüppell, 1837)</td>
<td>EN</td>
</tr>
<tr>
<td></td>
<td>Stegodontidae</td>
<td>Stegostoma fasciatum</td>
<td>zebra shark</td>
<td>(Hermann, 1783)</td>
<td>EN</td>
</tr>
</tbody>
</table>

**Batoids (rays, skates, wedgefishes, sawfishes)**

<table>
<thead>
<tr>
<th>FAMILY</th>
<th>SPECIES</th>
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<th>REFERENCE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mobulidae</td>
<td>Mobula alfredi</td>
<td>reef manta ray</td>
<td>(Krefft, 1868)</td>
<td>VU</td>
<td>CMS I</td>
</tr>
<tr>
<td>Mobulidae</td>
<td>Mobula birostris</td>
<td>giant manta ray</td>
<td>(Walbaum, 1792)</td>
<td>VU</td>
<td>CMS I</td>
</tr>
<tr>
<td>Mobulidae</td>
<td>Mobula kuhlii</td>
<td>shortfin devil ray</td>
<td>(Valenciennes, 1841)</td>
<td>VU</td>
<td>CMS I</td>
</tr>
<tr>
<td>Mobulidae</td>
<td>Mobula macrodon</td>
<td>giant devil ray</td>
<td>(Bonner, 1788)</td>
<td>EN</td>
<td>IUCN EN; CMS I</td>
</tr>
<tr>
<td>Mobulidae</td>
<td>Mobula tarapacana</td>
<td>sicklefin devilray</td>
<td>(Phillippi, 1892)</td>
<td>VU</td>
<td>CMS I</td>
</tr>
<tr>
<td>Mobulidae</td>
<td>Mobula thurstoni</td>
<td>bentfin devil ray</td>
<td>(Lloyd, 1908)</td>
<td>NT</td>
<td>CMS I</td>
</tr>
<tr>
<td>Myliobatidae</td>
<td>Myliobatus pristis</td>
<td>ornate eagle ray</td>
<td>(Bleeker, 1852)</td>
<td>EN</td>
<td>IUCN EN</td>
</tr>
<tr>
<td>Myliobatidae</td>
<td>Myliobatus tener</td>
<td>ornate eagle ray</td>
<td>(Bleeker, 1852)</td>
<td>EN</td>
<td>IUCN EN</td>
</tr>
<tr>
<td>Myliobatidae</td>
<td>Myliobatus californicus</td>
<td>ornate eagle ray</td>
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<td>IUCN EN</td>
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<td>Myliobatidae</td>
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</tbody>
</table>

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*a IOTC Resolution 12/05 (http://www.iotc.org/cms/resolution-1205-conservation-thresher-sharks-family-alopidae-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 carcase of thresher sharks of any species of the family Alopiidae”*

*b IOTC Resolution 13/06 (http://www.iotc.org/cms/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, transship, store or sell any part or whole carcase of oceanic whitetip sharks”*

*c IOTC Resolution 13/05 (http://www.iotc.org/cms/resolution-1305-conservation-whale-sharks-rhincodon-typus) CPCs “shall prohibit their flagged vessels from intentionally setting a purse seine net around a whole 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 whole 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”*
Regional Technical Workshop on Sharks and Rays of the Southwest Indian Ocean: Status Review and Development of a Roadmap for Conservation and Management

Advancing the development of a regional roadmap for the conservation and management of sharks and rays in the Southwest Indian Ocean
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
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 species 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 species
- 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)
Amie Bräutigam
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Tim Davenport
Ecological surveys - Baited remote underwater video (BRUV)

Neotrygon caeruleopunctatus
Acroteriobatus leucospilus
Rhina aNCYlostoma
Carcharhinus amblyrhynchos
Loxodon macrorhinus
Pseudoginglymostoma brevicaudatum
Negaprion acutidens
Ecological surveys - Baited remote underwater video (BRUV)

- Taeniurops meyeni
- Pateobatis fai
- Himantura uarnak
- Acroteriobatus leucospilus
Fish market surveys

Mustelus mosis

Pristiophorus nancyae

Rhina ancylostoma

Megatrygon microps

Aetomylaeus vespertilio

All photos: Magreth Kasuga/WCS
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.

IMPACT 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**

- **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.

- **Keystone Species**
  - If sharks are removed from the ecosystem, its balance and structure collapses, endangering the survival of all species.

- **Efficient Predators**
  - sharks are efficient predators and hunt weaker prey, removing the more vulnerable individuals. Old, sick, and slow reductions 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.

- **Need Our Help**
  - 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 & 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**
- **At least 25% of these species are threatened by overfishing, climate change, habitat loss, and coastal development.**

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