



Issue Title: Conservation and Management of Chondrichthyans (Sharks, Rays and Chimaeras) In the Western Indian Ocean¹

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Chondrichthyan status in the Western Indian Ocean

The Western Indian Ocean (WIO) has been identified as a global hotspot for chondrichthyan diversity (Dulvy et al. 2014), with 130 shark, 86 batoid (wedgfishes, skates and rays) and 11 chimaera species identified to date. The WIO is one of four global hotspots for chondrichthyan evolutionary distinctiveness (Dulvy et al. 2014), giving the region's chondrichthyans a high irreplaceability index (Stein et al. 2018), and highlighting the need for their conservation.

The WIO is also characterised by extensive fisheries, from the artisanal level to large-scale industrial fleets, as well as illegal, unreported and unregulated (IUU) fishing. There is a high demand for and legal and illegal trade in chondrichthyan products, with a high demand for shark meat for local consumption and for shark and batoid fins for the global shark fin trade. Chondrichthyans are also incidentally taken in a variety of industrial and small-scale fisheries throughout the region. Chondrichthyan species are generally slow growing, with late maturity and low reproductive capacity, making them highly susceptible to overfishing (Worm et al. 2013).

Owing to overfishing and other human impacts, the stocks of numerous species have declined, putting several species under threat (Dulvy et al. 2014). According to the IUCN Red List of Threatened Species (www.iucnredlist.org), 54 chondrichthyan species (24%) in the WIO are considered threatened, i.e. considered to be facing a high to extremely high risk of extinction in the wild (IUCN 2001), while 71 species (31%) are classified as Data Deficient, i.e. there is inadequate information to make a direct or indirect assessment of the species' risk of extinction. The WIO is also identified as one of four global hotspots in terms of the number of imperilled chondrichthyan species (Davidson and Dulvy 2017), and anecdotal evidence suggests that this number is increasing. Recent updates to IUCN Red List categorisations for chondrichthyan species in other regions, such as European and Mediterranean populations, have shown severe increases in threat status, with many species being re-classified into higher threat categories. The same negative result is expected in the WIO, when updated threat categories are published from the WIO species later in 2018. There is thus a critical need for corrective management and improved conservation of the WIO chondrichthyan species, particularly those that are threatened or likely to become threatened.

Overexploitation of chondrichthyan species can have direct impacts on their populations, and indirect impacts through cascading effects on the ecosystems and trophic webs. As thousands of people living in coastal communities within the WIO countries are dependent on fishes, chondrichthyan species and other marine resources for their income and livelihoods, as well as cultural or traditional uses, sustainable utilization of these resources is paramount, and as much a social issue as it is an ecological issue. Human populations, and consequently the demand for marine resources (including sharks and

¹ The geographic area referred to here by the term Western Indian Ocean includes the Indian Ocean territorial waters of the ten Nairobi Convention member states, from South Africa in the southwest, to Somalia in the northwest, and to Mauritius in the east, following the delineation of the Indian Ocean by the International Hydrographic Organization (2002), and excludes the marginal seas to the north.



rays), are increasing throughout the WIO. There is also evidence of human migrations towards coastal areas in search of improved food security and livelihoods (Barnes-Mauthe et al. 2013). Consequently, the impacts on chondrichthyan populations are likely to increase. However, there are currently poor data on the catches of chondrichthyan species, and large proportions of the catches, particularly in the artisanal sector and small-scale fisheries, as well as IUU fisheries, are not reported and remain unknown (Worm et al. 2013). There is thus a continued threat to WIO chondrichthyans, the severity of which is likely increasing.

Addressing these issues at international level

The Food and Agriculture Organization (FAO) of the United Nations developed an international plan of action (IPOA-SHARKS) for the conservation and management of sharks and rays (FAO 1999), which advocated that “States that contribute to fishing mortality on a species or stock should participate in its management” and that “States should adopt a national plan of action for conservation and management of shark stocks (Shark-plan) if their vessels conduct directed fisheries for sharks or if their vessels regularly catch sharks in non-directed fisheries”. The IPOA-SHARKS also suggests that this “applies to States in the waters of which sharks are caught by their own or foreign vessels and to States the vessels of which catch sharks on the high seas” (FAO 1999).

Addressing these issues in the Western Indian Ocean

Acknowledging the global status of threats to chondrichthyans, and mounting evidence of threats to chondrichthyan species in the WIO, the Nairobi Convention parties decided in 2012 to incorporate sharks in to the Nairobi Convention programme of work.

At the 7th Conference of the Parties (CoP) to the Nairobi Convention, held in Maputo, Mozambique in 2012, Decision CP7/12: *Conservation of Sharks* called for “regional collaboration, in consultation with the Secretariats of the Convention on International Trade in Endangered Species, Convention on Migratory Species, regional fisheries management organisations and other partners, on the conservation and management of sharks” and requested “the Secretariat in collaboration with the Contracting Parties to prepare a regional status report on the state of sharks especially on matters of institutional, legal and capacity and report to the next Conference of Parties”.

At the 8th CoP, held in Mahe, Seychelles in 2015, Decision CP8/9: *Threatened and Endangered Marine Species* was made “To urge the Secretariat, in partnership with the Wildlife Conservation Society, to finalize the Regional Status Report on Sharks and Rays in the Western Indian Ocean and circulate the report to all Contracting Parties for review and submit the final report with findings for consideration at the next Conference of Parties”.

Accordingly, the Wildlife Conservation Society (WCS), in collaboration with TRAFFIC, Florida International University and the IUCN shark specialist group, undertook a widespread assessment of the status of chondrichthyan species, and the fisheries that catch chondrichthyans and impact chondrichthyan populations, throughout the WIO, including all ten Nairobi Convention member states. The status report ***Sharks and Rays of the Western Indian Ocean – Biodiversity, Fisheries and Trade, Management and Conservation*** is now in the final stages of preparation, and WCS intends to present the report at the 2018 Nairobi Convention CoP.



Status report on chondrichthyans in the Western Indian Ocean region

The regional chondrichthyan status report identifies several recurring issues across the Nairobi Convention member states, and **recommended necessary actions** to address these issues.

1. Overfishing (including directed fishing and bycatch) in most sectors is a major threat to chondrichthyan species in the WIO. Populations of several species (for which assessments have been conducted) have declined, and numerous species are listed in the threatened categories of vulnerable (19%), endangered (3%) or critically endangered (2%) on the IUCN Red List. **There is thus a critical need for reduction of fishing pressure, fishery-related mortality and bycatch of chondrichthyan species.**
2. There is limited awareness of the poor conservation status of chondrichthyan species in the WIO and generally a poor understanding of their important ecological role in their relevant ecosystems and trophic webs, and thus a lack of cognisance of the impacts (direct and indirect) of overfishing these species. **There is thus a need to raise awareness of these issues, among fishers, governments and other stakeholders.**
3. Most chondrichthyan species have relatively broad geographic distributions and habitat usage, making them vulnerable to a range of fisheries and fishing gears. It is therefore important to understand the impacts of each fishery on each species. However, within the WIO region, there are little data available on catch rates at the species level for chondrichthyan species. **There is thus a need to assess the catches of chondrichthyans in the different fisheries in the WIO, to identify trends in the status of the resources, and in resource use.**
4. There is poor control of the trade in chondrichthyan products both within and out of the WIO region, and considerable discrepancies in statistics between export volumes (and taxa) from the WIO countries and import volumes into other countries outside of the WIO, which indicate inaccurate reporting, non-reporting and illegal trade in certain instances. **There is thus a need for stricter trade controls and improved monitoring, reporting and enforcement.**
5. There is a general lack of legislation developed specifically for chondrichthyan species, or legislation which includes these taxa in their text, in most WIO countries. Furthermore, while all ten Nairobi Convention member states have shark-directed fisheries or fisheries that take sharks as bycatch, or harbour species of sharks that are captured by fisheries in the waters of other countries, only four of these states have developed national plans of action (Seychelles, South Africa, Mauritius and Madagascar; Kenya is in the process) for shark and ray conservation and management. **There is thus a need for improved legislation and guiding policy, at regional and national levels.**
6. A high proportion (24%) of WIO chondrichthyans are classified as threatened on the IUCN Red List; however, few of these species are protected under national or international legislation or conventions. **There is thus a need to identify those species whose populations within the WIO 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.***



Roadmap for the Conservation and Management of Sharks and Rays of the Western Indian Ocean

In response to the need for guiding policy in the WIO, a region-wide initiative was undertaken, to develop a policy document to guide and prioritise conservation and management activities for chondrichthyans in the WIO region. This initiative was supported by the Indian Ocean Commission (IOC) and the Nairobi Convention, and led by WCS and TRAFFIC.

A regional workshop, held in Mauritius in April 2017, brought together relevant stakeholders from all ten Nairobi Convention member states. Using the outcomes of the regional status report as a baseline, the workshop delegates identified key issues facing chondrichthyans in the WIO and the conservation and management objectives to overcome these issues, as well required actions to meet these objectives. From this process a draft regional roadmap for shark and ray conservation was developed.

A subsequent workshop, held in Dar es Salaam in November 2017, brought together stakeholders from seven Nairobi Convention member states. At this meeting, delegates refined the objectives and required actions presented in the draft roadmap, to produce a final ***Roadmap for the Conservation and Management of Sharks and Rays of the Western Indian Ocean***. WCS now intends to present this document for consideration for acceptance at the 2018 Nairobi Convention CoP.

Species listing

One of the objectives of the regional status report was to identify shark and ray species for consideration for listing on the Annexes of the Nairobi Convention *Protocol Concerning Protected Areas and Wild Fauna and Flora in the East African Region*. WCS and Florida International University (FIU) collaborated to produce a list of species for consideration, which details the IUCN Red List status and legal status of these species under relevant conservation agreements. Supporting information on which to identify species requiring listing on Annex II, III or IV of the Protocol was obtained through several global and regional assessments and conventions, including assessments conducted by the IUCN shark specialist group (Dulvy et al. 2014), the Western Indian Ocean Fisheries Project (WIOFP, Kizska and van der Elst 2015), the Convention on the Conservation of Migratory Species of Wild Animals (CMS, www.cms.int), the Convention on International Trade in Endangered Species (CITES, www.cites.org), the Indian Ocean Tuna Commission (IOTC, www.iotc.org), and through consultation with regional experts. The initiative resulted in the preparation of the document ***Preliminary Recommendations for the Listing of Sharks and Rays in Annexes II, III, and IV of the Nairobi Convention Protocol Concerning Protected Areas and Wild Fauna and Flora in the East African Region***. WCS intends to submit this document for consideration at the 2018 Nairobi Convention CoP.

Policy recommendations

In summary, there is a need for improved chondrichthyan conservation and management in the WIO, and the implementation of guiding policy at regional and national levels, to ensure that the necessary actions are taken to reduce the impacts of human activities on chondrichthyans in the WIO, to manage chondrichthyan populations sustainably and allow the stocks of imperilled species to recover.

Appropriate and immediate management interventions could reduce human impacts on chondrichthyan populations and allow sustainable utilization of the resources. Failing to act now will



allow further negative impacts, further population declines and cascading impacts on the associated ecosystems, and will reduce the possibility of retarding population declines or effecting recoveries. Immediate actions are thus required.

Considering the highly migratory nature of many chondrichthyan species, as well as the global trade in chondrichthyan products, it is necessary to have international cooperation and coordination of shark and ray management, which would benefit from regional action plans. In addition, species that are identified as requiring strict protection or careful management in one or more states should be suitably listed at the regional level, to ensure regional level management and/or protection.

We urge the Conference of Parties to take the following steps, to reduce impacts on chondrichthyan populations and to improve their conservation status and the efficacy of their management:

- 1) Endorse the regional status report “*Sharks and Rays of the Western Indian Ocean – Biodiversity, Fisheries and Trade, Management, and Conservation*”;**
- 2) Adopt the regional “*Roadmap for the Conservation and Management of Sharks and Rays of the Western Indian Ocean*” and support member States to integrate this approach into national policies and legislation;**
- 3) Consider the proposed species listed in *Preliminary Recommendations for the listing of Sharks and Rays in Annexes II, III, and IV of the Nairobi Convention Protocol Concerning Protected Areas and Wild Fauna and Flora in the East African Region* for listing on the respective Nairobi Convention Annexes.**

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