SOMALIA

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INTRODUCTION

Somalia has a 3,330-km coastline spanning the Horn of Africa, with 1,200 km of coastline in the Gulf of Aden and 2,000 km bordering the Indian Ocean (Bihi, 1984; Sheik Heile & Glaser, 2020). Somalia has the longest coastline in mainland Africa and is home to one of the richest fishing grounds in the world. Its Exclusive Economic Zone (EEZ) is approximately 1,165,500 km^2 (Bihi, 1984; Sheik Heile & Glaser, 2020).

Somalia is divided into regional States, referred to as 'Federal Member States'. Somaliland, on the Gulf of Aden coastline, declared independence from Somalia in 1991. The State of Puntland borders both the Gulf of Aden and the Western Indian Ocean (WIO) and remains a semi-autonomous State of Somalia. Marine resources in Somalia have been ineffectively managed over the past 30–40 years, due to political and social instability since the civil war of the 1980s, the collapse of the national government in 1991, and piracy in Somali waters since the 1990s (Kelleher, 1998; Jennings, 2001; Trans-Africa, 2015).

Little research has been conducted on sharks, rays, and chimaeras, or their fisheries in Somalia, although at least 86 species have been confirmed, including 54 shark species, 31 ray species, and one chimaera species (IUCN, 2023). However, extensive legal and illegal fishing pressure has resulted in 51 (59%) of these species becoming threatened with extinction, including 22 Vulnerable, 20 Endangered, and nine Critically Endangered species, according to the IUCN Red List of Threatened Species (IUCN, 2023).

Somalia's coastline borders both the Indian Ocean and Gulf of Aden and is characterised by diverse ecosystems including dense mangrove stands and fringing coral reefs, particularly in the south of the country (Spalding et al., 2001). Somalia's Indian Ocean waters span two marine ecoregions: 1) the Central Somali coast ecoregion (Somali/Arabian marine province), which extends north to the boundary between the Indian Ocean and the Arabian Seas (IHO, 1953); and 2) the Northern Monsoon Current Coast which is shared with Kenya in the south and part of the WIO marine province (Obura, 2012; Spalding et al., 2007).

The Gulf of Aden ecoregion along Somalia's northern coastline, part of the Red Sea and Gulf of Aden marine province, has a rich faunal diversity with a mix of WIO and Red Sea species (Spalding et al., 2007). The Indian Ocean coastline has a diversity of habitats, with some coral reefs as well as small barrier islands known as the 'Bajuni Archipelago' (Marshall, 1997; Spalding et al., 2001), in the south, close to the Kenyan border. However, coral reefs are limited further north, where warm tropical waters give way to cooler waters caused by major upwelling within the highly productive Somali Current Marine Ecosystem. This is one of the world's Large Marine Ecosystems (LME), which supports many marine species of interest to fisheries, including large pelagic species such as tuna and tuna-like species (Kulmiye, 2010; Sumaila & Bawumia, 2014; Cashion et al., 2018; Sheik Heile & Glaser, 2020; van der Elst, 2022), and thus this is likely an important area for pelagic shark species.

FISHERIES

Fleets

Fisheries have historically been of less socioeconomic importance than other WIO States, supporting a relatively smaller proportion of the population (UNEP, 2005), with the livelihoods of an estimated 120,000 people dependent on fishing to some degree, and the lowest per-household fish consumption in Africa (Mohamed & Simba, 2016).

Three main fishery sectors exist, namely small-scale, semi-industrial, and industrial. Small-scale Somali fishers operate in coastal waters, from an estimated 2,500–4,700 small vessels of up to 10 m in length, while semi-industrial Somali fishers operate from vessels up to 23 m (Cashion et al., 2018; Sheik Heile & Glaser, 2020). Industrial fishing is conducted mostly by foreign fleets; historically through 'joint ventures' between foreign and local operators, but more recently almost entirely by foreign vessels (Cashion et al., 2018), mostly from the Soviet Union/Russian Federation, France, Italy, China, Japan, and Greece (Glaser et al., 2015). Illegal and semi-illegal foreign fishing vessels have also operated in Somalia since the collapse of the national government in 1991 (Persson et al., 2015).

Somali fishers use small wood or fibreglass boats to fish pelagic and reef associated species by hook and line and with nets. Before the state collapsed, Somalia had state-owned commercial trawlers which were regulated. Since 2020, Somalia has issued licences to approximately 120 Chinese longliners to operate for three consecutive years. Overexploitation of offshore marine fisheries resources is occurring as a result of the large number of commercial foreign fishing vessels (purse seine and longline vessels) mainly targeting tuna and tuna species, which includes Chinese, Spanish, and French vessels as well as Somali-flagged trawlers.

Sharks and rays have been targeted for centuries, predominantly in the artisanal sector for meat protein (Fowler et al., 2005; Ullah & Gadain, 2016), but they also comprise significant portions of the domestic small-scale and semi-industrial landings (Glaser et al., 2015; Persson et al., 2015). Foreign vessels illegally targeting demersal and pelagic species are also responsible for shark bycatch (Marshall, 1997), and these illegal fisheries persist (Glaser et al., 2019).

A 12-nautical mile (nm) restricted zone reserves the inshore area only for Somali fishers living on the coast, while a 24 nm protection zone prohibits access to fishing vessels other than those operated by Somali coastal fishers (Government of Somalia, 2023).

Gear

In the small-scale fishery, longlines, handlines and gillnets are most prevalent (Cashion et al., 2018; Sheik Heile & Glaser, 2020), while drift longlines, set longlines, and drift gillnets are used to target sharks (M.H. Ali, personal observation). In the industrial fishery, longline and purse seine vessels, and smaller gillnet vessels from neighbouring countries target tuna and tuna-like species, while coastal dhows and illegal trawlers target coastal and demersal species (Glaser et al., 2015).

PRODUCTION

Overall landings

Data for chimaeras are not available. Further, Somalia did not report any shark and ray catch data to the Food and Agriculture Organization of the United Nations (FAO) between 2012–2019, although several publications report on shark and ray landings, which appear to have risen substantially over the past five to six decades. In the early 1960s, approximately 21% of total catch comprised sharks (Thurow & Kroll, 1962) while in southern Somalia in the 1980s, sharks comprised an estimated 40% of artisanal fisher landings (Stromme, 1987). By the mid-1990s, sharks comprised about 55% of small-scale fisher landings in Somalia (Lovatelli, 1996; Cashion et al., 2018). The Puntland artisanal fishery landings peaked in the mid-1990s, growing rapidly from around 3,000 metric tonnes (mt) to 15,000 mt per annum, from 1991–1997 (Sone, 2010). These studies suggest that between 7,000–8,000 mt of sharks were landed annually in the Puntland artisanal fishery in the 1990s, with 8,990 mt formally reported in 2005 (Cashion et al., 2018). Including the south-central Somali region landings, an estimated total of >15,200 mt of sharks were landed in 2005 in Somalia, excluding catches made in Somaliland (Cashion et al., 2018).

A catch reconstruction suggested that sharks (25%) and rays (8%) together constituted the single greatest species group in the domestic fishery landings from 2005–2010 (Persson et al., 2015). Similarly, from 2005–2014, sharks and rays comprised the second greatest contributor (after tunas) caught by foreign vessels. This includes the Somali catches by Seychelles- and Yemen-flagged vessels (4–5%), and Portuguese-flagged vessels (70%), with evidence of shark targeting by some nations, such as Pakistan (Glaser et al., 2015, 2019). Overall, total reconstructed shark and ray catches amounted to 26,000 mt annually from 2005–2014, contributing 33% of total fishery landings in Somali waters – an unsustainable exploitation level with no room for increased capture (Glaser et al., 2015).

Species-specific

The most commonly caught shark species in the early 2000s were pelagic species, including thresher sharks (family Alopiidae), Shortfin Mako (*Isurus oxyrinchus*), and larger coastal species such as Blacktip Reef Shark (*Carcharhinus melanopterus*), hammerhead sharks (family Sphyrnidae), and Sharptooth Lemon Shark (*Negaprion acutidens*; Anderson & Simpfendorfer, 2005). In the last decade, the reported shark and ray catch composition has comprised of rays and manta rays (Mobulidae, 25%), Blacktip Reef Shark (15%), Common Thresher (*Alopias vulpinus*; 15%), mackerel sharks (family Lamnidae, 15%), hammerhead sharks (15%), Grey Reef Shark (*Carcharhinus amblyrhynchos*; 7.5%), and 'other sharks' (7.5%; Persson et al., 2015).

TRADE

Processing

Dried shark meat, fins, and liver oil were the primary products traditionally and historically in the artisanal fishery, while mobula rays (*Mobula* spp.) and stingrays (family Dasyatidae) tended to be caught incidentally and the meat dried (Marshall, 1997). Sharks reportedly dominated catches due to the high value of fins and because meat can be salt dried, thus not requiring freezing facilities (Lovatelli, 1996). Often only the shark fins are harvested, since vessels are small, space and salting facilities are limited, and the fins are worth significantly more than the meat.

Domestic

Shark meat is dried and generally consumed locally while liver oil is used for the maintenance of traditional fishing vessels, while meat of *Mobula* rays and stingrays is either dried (some of which is sold and consumed locally) or used as bait for longlines (Marshall, 1997). Dried shark fins are exported to Asia.

Export

From 2012–2019, Somalia reported no exports or imports of shark and ray products, and no other countries reported exports to Somalia (UN Comtrade, 2021). However, during this period, Canada, Hong Kong Special Administrative Region (SAR), Malaysia, Oman, Republic of Korea, Singapore, and the United Arab Emirates (UAE) reported importing shark and ray products from Somalia, averaging 5.62 mt of shark meat and 10.77 mt of shark fin annually (UN Comtrade, 2021). Hong Kong SAR's reported importing an average ofd 7.85 mt of shark fin annually, with most occurring from 2017–2019 (average 16.35 mt/year).

According to trade assessments, fins and meat are generally sold to local collectors, and in turn to traders in Bosaso and Mogadishu for export, with large volumes of meat being exported to Kenya and Yemen (Kulmiye, 2010; Glaser et al., 2015). Mombasa, Kenya, is considered the largest market for dried shark meat in East Africa, with annual estimates of 300–600 mt of dried and salted shark and ray products exported annually from Somalia to Kenya, of which 75% were sharks.

Somali fishers operating in the Gulf of Aden have also been reported to sell whole sharks (including fins) at sea to Yemeni fishing vessels (Glaser et al., 2015). Shark and ray products are also exported from Somaliland by boat, via Djibouti, to unknown final destinations in Asia.

A trade survey at various landing and processing areas and fish markets found that the price for whole sharks varied by species and size, from USD 30 per individual for Smooth Hammerhead (*Sphyrna zygaena*) to USD 350 for Scalloped Hammerhead (*Sphyrna lewini*). Shark oil was priced at USD 480 per 200 litre drum; meat at USD 2–3 per kg; whole jaws at USD 20; and fins at USD 180 per kg, depending on the size and species. Jaws were reported to be exported to Italy, fins to China via the UAE, and dried meat and oil to Tanzania, Yemen, and Kenya (M.H. Ali, personal observation).

There has also been a shift in targeting away from the historical capture of sharks for local meat consumption to focus more on the export of shark fins for the Asian fin trade (Ullah & Gadain, 2016). In parts of Somalia, in the early 2000s, artisanal fishers were reported to have focused heavily on shark finning, for the fin trade, whilst discarding thousands of tonnes of unused shark carcasses (Cashion et al., 2018). There are now direct product

value chains between Somalia and Asian destinations, such as Hong Kong SAR, for the export of shark fins (Glaser et al., 2015).

CULTURAL SIGNIFICANCE

There is no known cultural significance for sharks, rays, and chimaeras in Somalia.

RESEARCH

There has been limited research on sharks and rays, and there remains limited biological and ecological information to inform their management at national level. There is also limited funding for research on these and other fishery species in Somalia.

MANAGEMENT

Governance framework

The Ministry of Fisheries and Blue Economy (MFBE) is the mandated agency for management of marine resources and implementation of fisheries laws. Inshore fisheries are managed by Federal Member States within Somalia (e.g., in Puntland this is the Ministry of Fisheries, Ports and Marine Transport), while offshore fisheries are managed by the federal government in coordination with the States (Glaser et al., 2019). The Department of Coastal Biodiversity under the MFBE is responsible for marine species conservation, while Marine Protected Area (MPA) and coastal zone management are the shared responsibility of the MFBE, the Ministry of Tourism, and the Coast Guard; although no MPAs have yet been designated.

The Federal Government of Somalia was established in 2012, although it has limited control over the Federal Member States. As of 2023, there have been inconsistencies in fisheries-related laws between the Federal Member States and the Federal Government. However, a new draft bill (which may become cited as the Fisheries Act), which was finalised in 2021 but is yet to be published, will provide uniform regulation across all parts of the country as it applies to all areas of Somalia, but takes into account fisheries zones and the management authority of Federal Member States (Government of Somalia, 2021). Under this new draft Fisheries Act, a Fisheries Management and Development Council will be established and will function, *inter alia*, to make decisions regarding the management, development and sustainable use of shared fisheries resources and their environment (Government of Somalia, 2021).

The enforcement of fishery laws is the responsibility of the Navy, along with State-level entities such as the Puntland Maritime Police Force for the enforcement of Puntland's Fisheries Regulations (Hassan, 2011). However, the new draft Fisheries Act suggests that the MFBE shall be responsible for monitoring, control, and surveillance (MCS) activities and enforcement of the Act, in collaboration with relevant government agencies (Government of Somalia, 2021). Therefore, it is possible that the agencies/departments responsible for enforcement of fisheries laws may change upon promulgation of the draft Fisheries Act.

Policy

The 1959 Somaliland Maritime Code (Government of Somalia, 1959) was Somalia's first fisheries legislation, which prohibited certain fishing activities, such as the use of explosives, fishing in protected areas or with prohibited gears (Hassan, 2011). This law was superseded in 1985, by the Somali Democratic Republic Fishery Law No. 23 of 30 (Government of Somalia, 1985) and will likely be superseded again when the draft Fisheries Act (Government of Somalia, 2021) is promulgated; however, it is uncertain when this will take place.

State-level fishery regulations have also been passed. The Somaliland Fisheries Law (Government of Somaliland, 1995) is based primarily on the national Fisheries Law (Government of Somalia, 1985), and the associated Somaliland Fisheries Regulations were aimed at aligning exploitation levels with resource management principles. The Regulations require all fishing vessels operating in Somaliland waters to be licensed, regardless of their size, but provide no catch limits, no gear restrictions, and no area restrictions. There are no regulations for sharks and rays, and even finning is not prohibited. The Puntland administration also established fisheries regulations based on the 1985 national Fisheries Law (Glaser et al., 2015).

Somalia declared its EEZ in 2014 (UN General Assembly, 2014) and updated the federal fisheries legislation with the Somali Fisheries Law (Government of Somalia, 2014), which prohibits bottom trawling, prohibits catches that exceed optimum sustainable yield, details stricter reporting requirements and reserves the first 12 nm of Somali waters for Somali fishers only. However, the 2014 Law again makes no specific provision for sharks and rays but prohibits the fishing of 'endangered aquatic organisms', although the law presents no definition for the term 'endangered'.

The 2014 Law was adopted a year after Somalia became a member of the Indian Ocean Tuna Commission (IOTC). The MFBE thus reviewed Somalia's Fisheries Law to ensure that it would reflect the conservation and management measures of regional fisheries management organisations and multilateral environmental agreements (MEAs), as well as the protection of endangered species (Sheik Heile, personal communication, 2021).

In July 2020, a new federal Fisheries Bill (the Fisheries Act) was drafted on the sustainable management and development of fisheries, aquaculture and related activities in Somalia (Government of Somalia, 2021). On March 22, 2023, the president signed into law the Somali Fisheries Development and Management Act. This new Fisheries Act defines several Fisheries Zones:

- Fisheries Restricted Zone – within which semi-industrial and industrial vessels are prohibited from any fishing in an area which encompasses the first 12 nm from shore, which is reserved for the exclusive use of artisanal fishing and related activities by Somali citizens and Somali vessels up to 12 m long;
- Fisheries Protection Zone – an area adjacent to the Fisheries Restricted Zone and extending to 24 nm, which is reserved for the exclusive use of Somali citizens and vessels up to 24 m long; and
- Fisheries Exclusive Economic Zone – extends from 24 nm to 200 nm seawards, and within which any licensed fishing vessel is permitted.

Apart from the general laws that protect 'endangered' marine species, there are no specific laws regulating the catch and trade of sharks under the current Somali Fisheries Law. Section 19 of the draft Fisheries Act relates to protected, threatened or endangered species of fish, although it does not define these terms and does not list any specific species that are prohibited from capture, but suggests that the Minister may declare any fish species as protected, threatened, or endangered through a notice in the official government bulletin and on the official website of the Ministry, or by Regulation, including species listed under international agreements of regional fisheries management organisations (RFMOs; Government of Somalia, 2021). The Act also provides for the implementation of obligations and standards under international agreements and international conservation and management measures; however, no specific fish species that are listed as prohibited under the various MEAs are currently protected by the Act.

The Fisheries Act also indicates that purse seine and longline vessels must take measures to mitigate bycatch of non-target species; that the dumping of non-target species at sea is prohibited; and that all non-target species still alive must be released. Purse seine vessels are permitted to retain certain bycatch species, but the retention of sharks and rays is not permitted. Furthermore, any vessel operator shall not intentionally set a purse seine within close proximity to a Whale Shark (*Rhincodon typus*), and should a Whale Shark be accidentally caught, it must be released immediately.

In terms of gear regulations, fish aggregating devices (FADs) are only permitted under authorisation from the Director General of the MFBE. Furthermore, the use of explosives, poison or noxious substances for fishing-related purposes is prohibited, as are trawling and large-scale drift nets (defined as gillnets or other nets that span greater than 2.5 km in length and are designed to catch fish). Aircraft and unmanned aerial vehicles are not permitted to be used as fishing aids, and the use of artificial lights to attract fish to purse seine and longline vessels is prohibited.

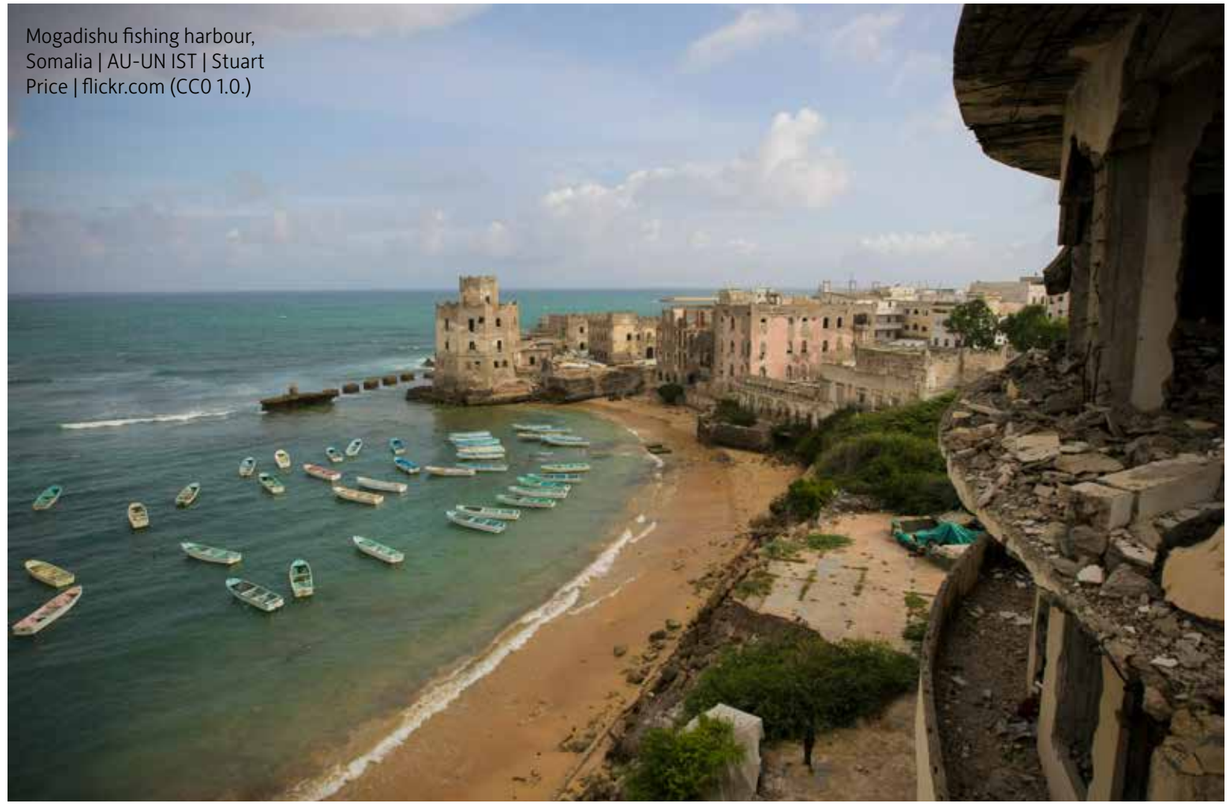
Section 31 of the draft Fisheries Act pertains specifically to prohibitions on the removal and sale of illegally removed shark fins, such that:

- All sharks caught must be fully utilised;
- Shark fins must remain naturally attached to the carcass until at least the first point of landing;
- Vessels that land sharks frozen must have on board fins that total more than 5% of the weight of sharks;
- The vessel operator shall release all shark species caught that are not permitted (although it does not specify which species are not permitted); and
- The buying or selling of shark fins removed on-board, retained on-board or landed in contravention of the Act is prohibited.

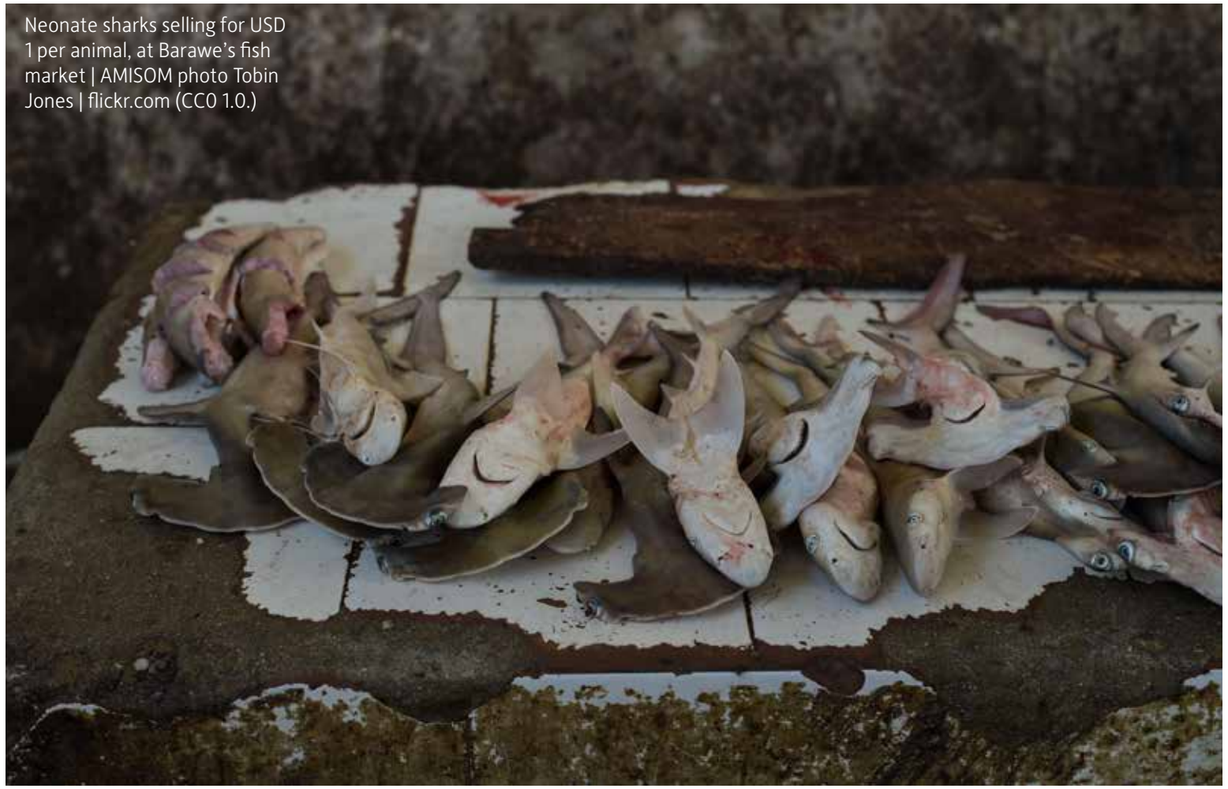
Although the bill lacks details with regards to which shark and ray species are prohibited from capture, the country is making significant improvements to its fisheries legislation, as it relates to the management of fisheries that catch sharks and rays.

Enforcement and monitoring

The Fisheries Law of 1985 placed enforcement authority on the Somali Navy and developed the licensing framework to include an application process that increased accountability and required fishery data collection. Owing to the civil war and the absence of a central government, there was no enforcement of fisheries legislation between 1991–2012,



Mogadishu fishing harbour, Somalia | AU-UN IST | Stuart Price | flickr.com (CC0 1.0.)



Neonate sharks selling for USD 1 per animal, at Barawe's fish market | AMISOM photo Tobin Jones | flickr.com (CC0 1.0.)

Offloading sharks from small scale vessels in Mogadishu, Somalia | Mohamed Osman, IISD Impact Images, 2022 | flickr.com (CC BY-NC-SA 2.0.)

leaving Somali waters unregulated and unprotected (Samatar, 2007). The legal ambiguity of Somalia's EEZ prior to 2014 also made it difficult to include Somali waters in regional MCS efforts and meant that foreign fishing in these waters was not technically illegal; however, greater regional cooperation to combat illegal, unreported, and unregulated (IUU) fishing should now be possible (Persson et al., 2015).

Under the new draft Fisheries Act (Government of Somalia, 2021), the Minister shall designate a Department to lead MCS activities relating to the Act and will be responsible for coordinating the Federal Member States and other relevant entities concerning MCS activities in Somalia. Provisions are also made for the establishment of a centralised information system to promote the harmonization of data collection by the Ministry and Federal Member States.

Community involvement

Coastal communities feel isolated and they are not consulted about the Federal and state members' decisions concerning resource uses and management. Lack of trust towards federal government and federal member states is also identified as many coastal communities believe that authorities unlawfully allowed commercial trawlers that depleted fish stocks in inshore waters reserved only for local fishers.

Gaps

- There is limited scientific data for Somali fisheries and limited fishery monitoring and reporting, making management of fisheries resources challenging and inhibiting efforts to combat IUU fishing (Sheik Heile et al., 2018);
- Somalia has reported limited landings data to the FAO, and foreign vessels do not report non-IOTC species caught (including sharks and rays) to Somalia, thus increasing the risk of overfishing (Glaser et al., 2019);
- Unknown quantities of fishery resources have been removed, partly due to IUU fishing, so baseline stock information regarding fishery resources remains unknown;
- 59% of shark and ray species confirmed in Somalia are threatened, as a result of overexploitation. Although the new Fisheries Act (Government of Somalia, 2021) caters for protected, threatened or endangered species of fish, the Act does not define these terms and does not list any specific species that are prohibited from capture;
- Sharks and rays and their important habitats receive no spatial protection, as no MPAs have been declared in Somalia (UNEP-WCMC & IUCN, 2023);
- Limited fishery regulation and enforcement may have resulted at one stage becoming a refuge for shark fishers displaced from other waters due to declining populations or stricter regulations related to shark fishing, such as bans on shark finning (Glaser et al., 2015);
- There is limited capacity for fisheries MCS, and a lack of enforcement of fishery laws;
- There are poor trade controls and confirmed international trade in Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)-listed shark and ray species, in contravention of CITES trade controls, despite no reports of CITES-listed exports from Somalia on the CITES trade database;
- Human capacity for conservation and management is limited;
- Human capacity and financial resources for fishery data collection and analysis are limited, in turn limiting Somalia's ability to collect and report basic fishery statistics (Sheik Heile et al., 2018);
- Technical support is needed to train Somali staff in outreach and advocacy; and
- Existing laws and regulations are outdated. There is a lack of inter-agency cooperation between the Ministry and other federal and state law enforcement agencies.

RECOMMENDATIONS

- Management measures must be implemented in both domestic and foreign fishing fleets to ensure that fishing of shark and ray species is sustainable and that bycatch of threatened species and areas of high bycatch rates are avoided;
- Legal protections must be implemented for relevant threatened species;
- Measures are needed to reduce the level of IUU fishing, including coordinated efforts to update legislation, improve enforcement and judiciary capacity, introduce community-based enforcement, and develop an anti-piracy task force (Trans-Africa, 2015);
- Measures imposed under MEAs to which Somalia is signatory, such as the Convention on Migratory Species (CMS) and CITES, must be better implemented;
- In line with the measures under IOTC and CMS, the capture of mobulid rays (including incidental capture) should be prohibited, to mitigate against the known targeted and incidental catches of these species;
- There is a need to involve coastal communities in decision making processes to gain their support. Those involved in fish trade should also be sensitized and encouraged to play a role in conservation efforts;
- MPAs should be implemented in ecologically important areas, such as mating, pupping and nursery grounds, to provide protection for threatened sharks, rays and other marine species, and their important habitats; and
- Improved ecological information is needed on shark and ray species, which could guide the government in the implementation of appropriate management and conservation measures.

Policy

- Somali State fisheries authorities should introduce and enforce the respective State's fisheries regulations in a systematic manner involving all the stakeholders to mitigate against overfishing (Kulmiye, 2010), particularly the Fisheries Act (Government of Somalia, 2021);
- Stricter regulations will need to be implemented legally. Although the new Fisheries Act (Government of Somalia, 2021) provides for the Minister to declare any fish species as protected, threatened, or endangered through a notice in the official government bulletin, to date no shark or ray species are protected in Somalia. Therefore, species-level measures will need to be implemented for species requiring stricter fishery controls or prohibition. Alternatively, a specific law/decree relating to sharks and rays would be an option to provide a legal framework for the protection of threatened and overexploited shark and ray stocks;

- There are eight shark and ray species either confirmed or reported from Somali waters that are listed on CMS Appendix I, and thereby require national level protection, including Oceanic Whitetip Shark (*Carcharhinus longimanus*), Oceanic Manta Ray (*Mobula birostris*), Longhorned Pygmy Devil Ray (*M. eregoodoo*), Shorthorned Pygmy Devil Ray (*M. kuhlii*), Spinetail Devil Ray (*M. mobular*), Largetooth Sawfish (*Pristis pristis*), Green Sawfish (*P. zijsron*), and Whale Shark (Bennett et al., 2022). Three thresher shark species (in addition to six shark and ray species also listed under CMS I), also require retention bans in the tuna-associated fisheries, based on IOTC resolutions.

Science/knowledge/research

- Primary research needs include the collection of baseline data on shark and ray biodiversity, fisheries and trade, and threats faced by sharks and rays in this region (Berbera Port Authority, 2015);
- Improved catch data collection is essential and could be achieved through strict and enforced reporting requirements, observer programmes and vessel logbooks. Some collective efforts have been made by the Ministry of Fisheries and Marine Resources, now renamed as the Ministry of FIsheries and Blue Economy, with the help of Secure Fisheries and local institutions to develop a data collection system that would be important for management use;
- A national fishery monitoring program should be implemented and could be achieved through expansion of existing data collection activities (including catch and effort data for shark and ray species), including training on fisheries monitoring and data collection and identification of dedicated fish landing sites to facilitate comprehensive data collection (Kulmiye, 2010; Berbera Port Authority, 2015);
- Catch data collection must be at species level in all fisheries and all States (Glaser et al., 2015);
- There is a need to improve data management systems, and to initiate or improve the use and implementation of vessel monitoring system technology (Trans-Africa, 2015);
- There is an urgent need to conduct stock assessments, surveys and other relevant studies to establish status, distribution, abundance and fishery potential of the key target species known to be vulnerable to fishing pressure (Kulmiye, 2010); and
- Research facilities of the recently established marine institutions should be improved and used to train marine scientists capable of carrying out long term research across the Somalian coast.

Management/governance/conservation

- The development and implementation of a robust National Plan of Action for Sharks would provide a useful framework for the management of shark and ray resources and fisheries;
- Regulations already gazetted but not yet enforced must be enforced, such as the ban on bottom trawling;
- Considering the fishery threats to threatened shark and ray species, IOTC measures should be adopted in fisheries under IOTC management as well as for smaller vessels operating within the Somali EEZ, to reduce impacts on such species;
- Improved implementation and enforcement of legal licensing systems will be necessary, to reduce the number of vessels operating illegally;
- Improved international cooperation in fisheries is necessary, including coordination with and adherence to international agreements, and measures to improve MCS activities to combat IUU fishing and piracy (Kulmiye, 2010);
- Trade controls must be improved to mitigate against the high level of unreported and illegal exporting of shark and ray products (by Somali and foreign fishers). This includes improvements in the implementation of (and implementing mechanisms for) CITES trade controls, such as *inter alia* conducting Non-Detriment Findings (NDFs) for CITES-listed species, to determine whether or not trade can be undertaken without negatively impacting the wild populations;
- It is essential that measures are implemented to reduce shark and ray discards, in order that the potential benefits (protein and income) of the otherwise discarded products may be realized (Kulmiye, 2010); and
- Improved transparency and accountability is needed in reporting fishery landing statistics.

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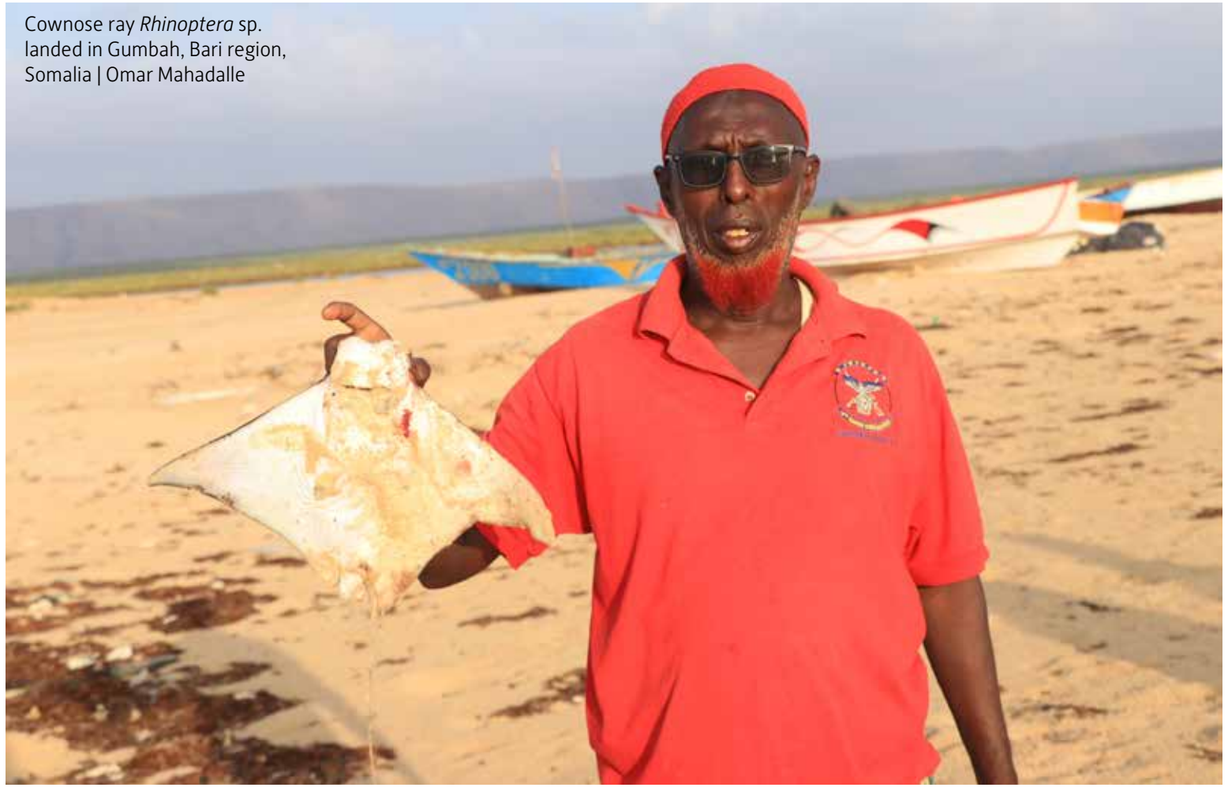
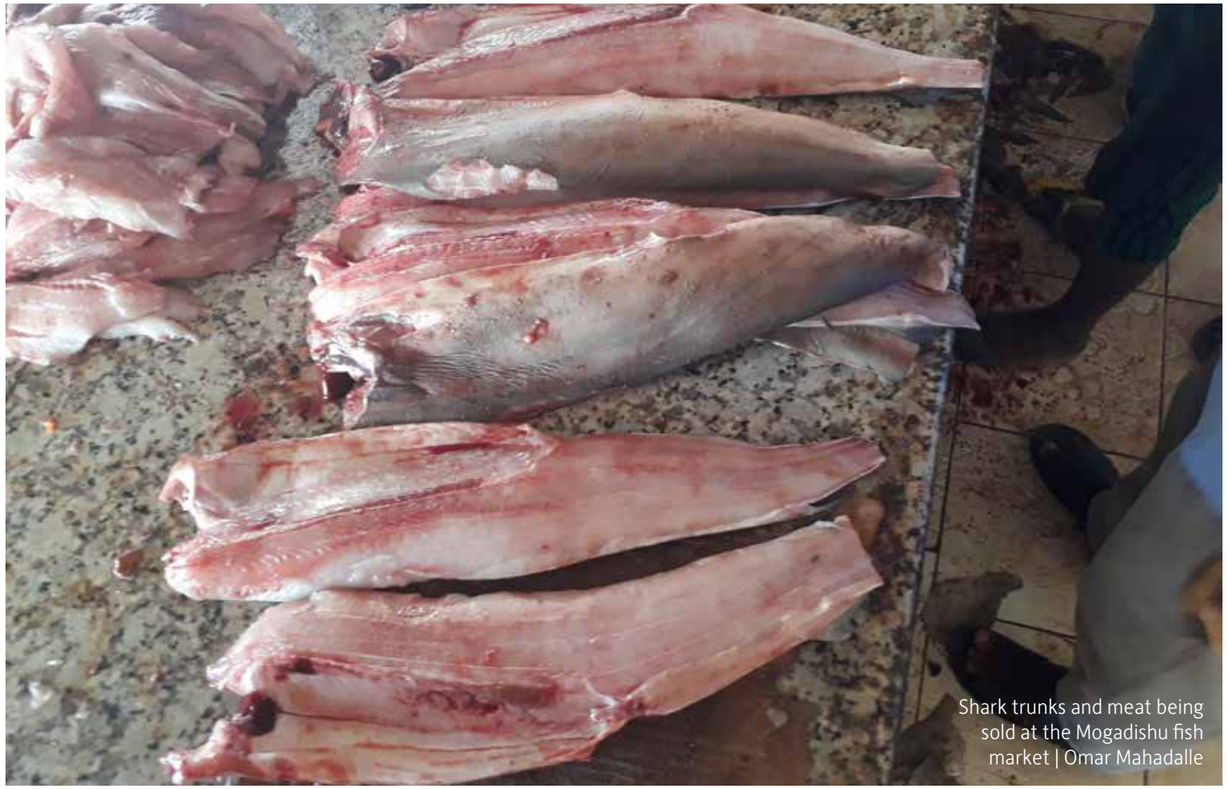


Cownose ray *Rhinoptera* sp. landed in Gumbah, Bari region, Somalia | Omar Mahadalle

Gulper sharks *Centrophorus* spp. landed in Geesaley, Bari region, Somalia | Ahmed Buurane

Shark remains on the beach after processing on Liido Beach, Somalia | Omar Mahadalle



Shark trunks and meat being sold at the Mogadishu fish market | Omar Mahadalle

Shark fins bring dried in Mogadishu | Omar Mahadalle