

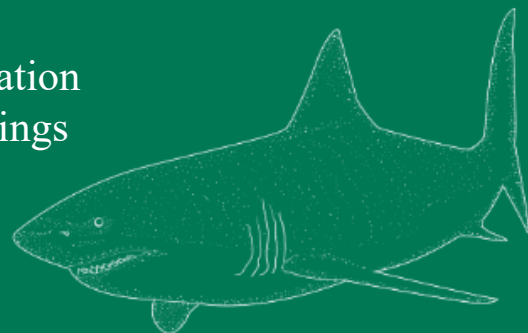


Sustainable Forests & Livelihoods (SUFAL) Project

Shark and Ray and Associated Species Conservation
Strategy Development and Non-Detriment Findings

Final Report

January 2021 - July 2022



October 2022



Bangladesh Forest Department
Ministry of Environment, Forest and Climate Change

Final Report:

Shark and Ray and Associated Species Conservation Strategy Development and Non-Detriment Findings

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Cover Photo

Government representatives attending the third national consultation on a National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh included the Honorable Minister, Secretary, and Additional Secretary, from the Ministry of Environment, Forest, and Climate Change, the Chief Conservator of Forests, and the SUFAL PD and Project Management Unit members. © WCS Bangladesh



Executive Summary

The Wildlife Conservation Society (WCS) completed planned activities of the *Shark and Ray and Associated Species Conservation Strategy Development and Non-Detriment Findings* assignment addressing objectives that include (1) Protecting sharks and rays threatened by overexploitation from targeted and non-targeted catches; (2) Ensuring that the exploitation of non-threatened sharks and rays is sustainable and does not result in them becoming threatened; (3) Sustaining fishing livelihoods through the conservation of threatened sharks and rays and sustainable exploitation of non-threatened species; (4) Developing an informed public about the critical role of sharks and rays in maintaining a healthy ecosystem through mass awareness programs for species conservation; (5) Establishing a strong capacity among government and community stakeholders for the conservation management of sharks and rays; (6) Achieving compliance with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and (7) Strengthening coordination with the Department of Fisheries regarding shark and ray conservation.

For conducting an assessment on the status of sharks and rays and identifying threats to their survival, WCS made 2,602 visits to six fish landing sites, recording 394 landings of 616,850 sharks from 14 species with 99% from the Carcharhinidae and Sphyrnidae families, and 559 landings of 92,128 rays, from 39 species with 72% coming from the Dasyatidae and Gymnuridae families. Altogether these sharks weighed about 406 tonnes and were sold by fishers for about 48 million BDT while the rays weighed about 340 tonnes and were sold by fishers for about 66 million BDT.

During the SUFAL shark and ray assignment WCS updated the list of sharks and rays occurring in Bangladesh, documenting 31 shark and 60 ray species as confirmed with an additional 25 shark and 11 ray species suspected to occur in the country. Of the 127 shark and ray species confirmed or suspected as occurring in Bangladesh, 76% are globally threatened in the IUCN Red List. During the SUFAL assignment WCS also examined shark and ray catches from 59 fishing boats, conducted interviews with 150 fishers and traders, and investigated shark and ray catches in commercial trawlers.

Research conducted under the SUFAL shark and ray consultancy assignment, supplemented by scientific investigations and policy related activities conducted by WCS between 2016-2019, were presented in the *Shark and Ray Assessment Report - Baseline information on the status, threats, and governance in Bangladesh* (SAR). This document was used to inform the *National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh* (NCS/NPOA-Sharks & Rays) which was developed in a collaborative process including four consultative workshops with relevant community and government stakeholders. The NCS/NPOA-Sharks & Rays includes strategic conservation priorities and governance frameworks for improving the protection of threatened sharks and rays, ensuring that the exploitation of non-threatened species does not result in them becoming threatened, and sustaining productive fishery livelihoods and marine conservation management.

CITES Non-Detriment Findings (NDFs) for Silky and Smooth hammerhead sharks, and Mobulid and Rhino rays were also developed by 22 wildlife and fisheries experts during two intensive three-day long workshops. These workshops resulted in a positive NDF assessment for Silky sharks, with a 200 cm minimum retention length, and negative NDF assessments for Smooth hammerhead sharks, and Mobulid and Rhino rays. Under the SUFAL assignment, WCS also provided trainings, communication tools, and technical support to law enforcement agencies on identifying protected sharks and rays and prosecuting illegal trade. In addition, we conducted interactive *Ocean Guardians – Protecting Threatened Sharks and Rays in Bangladesh* exhibitions in six coastal fish landing sites. These mass awareness programs engaged more than 4,000 visitors including wildlife, fisheries, and law enforcement officers, fishers, and fish traders.

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Acronyms and Abbreviations

BFD	Bangladesh Forest Department
BFDC	Bangladesh Fisheries Development Corporation
BFRI	Bangladesh Fisheries Research Institute
CCF	Chief Conservator of Forest
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species
COFI	Code of Conduct for Responsible Fisheries
CoP	Conference of Parties
CR	Critically Endangered
DD	Data Deficient
DG	Director General
DoF	Department of Fisheries
DPD	Deputy Project Director
DU	University of Dhaka
EN	Endangered
FAO	Food and Agriculture Organization of the United Nations
FIQC	Fish Inspection and Quality Control
IOTC	Indian Ocean Tuna Commission
IPOA-Sharks	International Plan of Action for Conservation and Management of Sharks
IUCN	International Union for Conservation of Nature
LC	Least Concern
MFO	Marine Fisheries Office
MFSMU	Marine Fisheries Survey Management Unit
MoEFCC	Ministry of Environment, Forest, and Climate Change
MoFL	Ministry of Fisheries and Livestock
MPA	Marine Protected Area
MSP	Marine Spatial Planning
NCS/NPOA	National Conservation Strategy and Plan of Action
NDF	Non-Detriment Finding
NGO	Non-Governmental Organization
NOC	No Objection Certificate
NPOA	National Plan of Action

NT	Near Threatened
PD	Project Director
PMU	Project Management Unit
PSO	Principal Scientific Officer
SAR	Shark and Ray Assessment Report
SAU	Sher-e-Bangla Agricultural University
SBN	Set-bag net
SoNG	Swatch-of-No-Ground
SUFAL	Sustainable Forests and Livelihoods Project
SRF	Sundarbans Reserved Forest
VU	Vulnerable
WCCU	Wildlife Crime Control Unit
WCS	Wildlife Conservation Society

1. Conduct an assessment for the scientific investigations on the status of sharks and rays and identify threats to their survival

Under the Sustainable Forests and Livelihoods (SUFAL) Project consultancy assignment on *Shark and Ray and Associated Species Conservation Strategy Development and Non-Detriment Findings*, the Wildlife Conservation Society Bangladesh Program (WCS) conducted at-sea and land-based investigations to assess the status of sharks and rays in Bangladesh, identify threats to their survival, and formulate conservation management recommendations. Detailed results and analysis from research on shark and ray fisheries, catches, landings, and trade were provided in three progress reports submitted to the SUFAL Management Unit (PMU) as per contractual agreement in July 2021, January 2022, and July 2022.

Results from research conducted under the SUFAL shark and ray consultancy assignment were supplemented by results from scientific investigations, educational outreach, and policy related activities conducted by WCS between 2016-2019 in partnership with citizen scientists and government agencies. These were presented in the *Shark and Ray Assessment Report - Baseline information on the status, threats, and governance in Bangladesh* (SAR) submitted in July 2021 along with the first progress report to the SUFAL PMU (see Chapter 2).

The SAR informed the *National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh* (NCS/NPOA-Sharks & Rays) with suggested strategic conservation priorities, actions, and governance frameworks for improving protection of the most endangered sharks and rays, ensuring that the exploitation of non-threatened species does not result in them becoming threatened, and sustaining productive fishery livelihoods and marine conservation management (see Chapters 4, 6, 7).

Key findings from scientific investigations conducted by WCS under the SUFAL shark and ray consultancy assignment between January 2021 and May 2022 are summarized below. These findings also provided invaluable information to inform the *Draft Integrated Management Plan for the Swatch-of-No-Ground Marine Protected Area* and the *Report on a proposed Bangladesh Blue Belt OECM* (Other Effective Area-based Conservation Measures), both documents prepared by WCS for the Bangladesh Forest Department (BFD).

Shark and ray diversity and conservation status

As per July 2022, 31 shark and 60 ray species have been confirmed as occurring in Bangladesh, with an additional 25 shark and 11 ray species suspected to also occur based on records in neighboring waters but their presence has not been confirmed (Appendix 1 and 2). Of the 127

shark and ray species documented or suspected to occur in Bangladesh, 97 or 76.4% (37 shark and 60 ray) are globally threatened (Critically Endangered (CR), Endangered (EN) or Vulnerable (VU)) according to the global IUCN Red List. CR sharks confirmed as occurring in Bangladesh include Ganges *Glyphis gangeticus*, Scalloped hammerhead *Sphyrna lewini*, and Great hammerhead *S. mokarran* sharks. CR rays confirmed as occurring in Bangladesh include the Sharpnose guitarfish *Glaucostegus granulatus*, Widenose guitarfish *G. obtusus*, Giant guitarfish *G. typus*, Shorttail whiplay *Maculabatis bineeshi*, Largetooth sawfish *Pristis pristis*, Bowmouth guitarfish *Rhina ancylostoma*, Bengal guitarfish *Rhinobatos annandalei*, and Smoothback guitarfish *R. lionotus*.

Three ray species occurring in Bangladesh are listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), namely the CR Largetooth and Green *P. zijsron* sawfishes, and the EN Narrow/Pointed sawfish *Anoxypristis cuspidata*. Seven confirmed and five suspected shark species and 10 confirmed and three suspected ray species occurring in Bangladesh are listed in CITES Appendix II (Figure 1, Appendix 1 and 2).

Recorded		Suspected		CR EN VU Threatened		International Trade Regulated	
	31		25		37		12
	60		11		60		16

Figure 1. Most sharks and all ray species confirmed in Bangladesh are threatened with extinction as per the IUCN Global Red List and almost one third are included in CITES Appendix I or II.

Seven CITES Appendix II listed rays were documented at six fish landing sites during the SUFAL consultancy assignment, including Spinetail *Mobula mobular*, Shortfin *M. kuhlii*, Bentfin *M. thurstoni*, and Sicklefins *M. tarapacana* devilrays, and Sharpnose, Widenose, and Bowmouth guitarfishes, which together with unidentified *Mobula spp.* and *Glaucostegus spp.* accounted for 16% of all ray landings. CITES Appendix II listed Scalloped hammerhead sharks, including unidentified *Sphyrna spp.*, accounted for 25% of all shark landings recorded by WCS at six fish landing sites (see below). Dried gill plates of Mobulid rays and the fins of Rhino rays and Hammerhead sharks are highly valued in international trade, thereby incentivizing fishers to retain these species despite relatively little domestic demand for their body parts (see section below on *Domestic and international trade of shark and ray products in Bangladesh*).

Discoveries of rare and new shark and ray species in Bangladesh

During the SUFAL shark and ray consultancy assignment, members of the WCS *Citizen Scientist Shark and Ray Landing Site Data Collector Network* photo-documented VU Dwarf whiprays *Brevitrygon heterura* and Data Deficient (DD) Smalleye stingrays *Megatrygon microps*. This was only the second time ever that WCS recorded Dwarf whiprays, confirmed by international experts, and the first photo-evidence confirming the presence of Smalleye stingrays in Bangladeshi waters. A ray from the *Maculabatis* genus, suspected by international experts to be a new species record for Bangladesh, possibly the Pakistan whipray *Maculabatis arabica*, was also documented by a member of the WCS *Citizen Scientist Shark and Ray Landing Site Data Collector Network* during the SUFAL assignment (Figure 2).

On 12 January 2022, the citizen scientist at Charfasson in Bhola engaged by WCS as a shark and ray landing site data collector documented a juvenile specimen of the CR Ganges shark. This exceedingly rare freshwater tolerant shark was reportedly caught in the Meghna River estuary, indicating a potential nursery ground for the species. According to the global IUCN Red List assessment, fewer than 250 mature Ganges sharks are estimated to remain across its limited range in the tropical Indo-Pacific (Figure 2).



Figure 2. Photographs taken by the WCS *Citizen Scientist Shark and Ray Landing Site Data Collector Network* confirm the presence of the Dwarf whipray (top left) and Smalleye stingray (top right) in Bangladesh, a possible new species for Bangladesh from the *Maculabatis* genus (bottom left), and a rare Ganges shark (bottom right).

These discoveries highlight the value of empowering local fishing community members as citizen scientists for collecting photo-verified species-specific information on landings of sharks and rays. Citizen scientists can also engage with local shark and ray fishery stakeholders for promoting compliancy with national and international species protection and trade regulations and strengthening marine stewardship.

Shark and ray landings of small-scale coastal fisheries

As detailed in the 3rd progress report, between January 2021 and May 2022, the WCS *Citizen Scientist Shark and Ray Landing Site Data Collector Network* made 2,602 visits to the six fish landing sites in Alipur/Kuakata, Cox's Bazar, Parerhat, Rupsha/Khulna, Bhola, and Saint Martin's Island.

Photo-verified data were recorded on 394 landings of 616,850 sharks from 14 species. Shark landings were recorded during 15% of the visits with the highest percentage per visit in Cox's Bazar (40%) followed by Parerhat (13%). The total weight of landed sharks was about 406 metric tonnes with an estimated selling price of more than 47.6 million (4 crore 76 lakh) BDT or about 560,000 USD.

Landed sharks were dominated by the Carcharhinidae family (74%) and Sphyrnidae family (25%), with just three species accounting for 66% of landings, including Near Threatened (NT) Spadenose sharks *Scoliodon laticaudus* (31%), CR Scalloped hammerhead sharks (24%) and VU Bull shark *Carcharhinus leucas* (11%). Two thirds of all shark landings occurred from November to March, following the 22-days fishing ban period (4-25 October 2021) with 66% caught in medium-mesh gillnets, 12% in large-mesh gillnets, 10% in baited mid-water longlines, and the remaining in set-bag nets and unbaited bottom-set long lines.

A total of 559 landings of 92,128 rays from 39 species were recorded during the same period. Rays were found during 21% of the landing site visits with the most ray landings recorded in Cox's Bazar (42%) followed by Saint Martin's Island (30%). Landed rays had an estimated total weight of 340 metric tonnes with an approximate selling price of nearly 65.5 million (6 crore 55 lakh) BDT or about 770,600 USD.

Rays were dominated by the Dasyatidae and Gymnuridae families that together made up 72% of all landings. Dominant species were VU Longtail butterfly rays *Gymnura poecilura* (14%), CR Sharpnose guitarfish (8%), VU Bengal whiprays *Brevitrygon imbricata* (7%) and EN Honeycomb whiprays *Himantura undulata* (6%). Almost 80% of all ray landings occurred from November to April with 44% caught in medium-mesh gillnets followed by 17% in bottom-set longlines with hundreds of unbaited hooks specifically targeting rays and 16% in midwater-set baited longlines.

The approximately 750 tonnes of more than half a million sharks and almost one hundred thousand rays recorded during the SUFAL shark and ray consultancy assignment (January 2021 - May 2022) by the WCS *Citizen Scientist Shark and Ray Landing Site Data Collector Network* underestimate the number of total sharks and rays landed because i) our data collectors were only able to collect information on shark and ray landings during 83% of the SUFAL consultancy period (516 days); ii) during busy days some sharks and rays were landed that did not get recorded; iii) we were only able to monitor six landing sites while the Bangladesh Fisheries Development Corporation (BFDC) under the Department of Fisheries (DoF) operates eight fish landing sites and there are at least 13 other official coastal fish landing sites operated by local fish merchants or *arotdar* associations with additional sites operated seasonally; and iv) the 528 tonnes/year (750 tonnes/1.42 years (one year and 5 months) = 528 tonnes/year) from partial sampling of landings from coastal small-scale fisheries at six landing sites do not include shark and ray landings from industrial fisheries.

At-sea investigation of elasmobranch catches of coastal small-scale fisheries in Bangladesh

As detailed in the 3rd progress report, WCS conducted fisheries investigations from 24 November 2021 to 13 February 2022 in a locally hired vessel along 443 kms of systematic transect lines in nearshore waters generally less than 10 m deep between the eastern boundary of the Sundarbans Reserved Forest (SRF) and Nijhum Dwip National Park/Marine Protected Area (MPA), searching for fishing operations and examining their shark and ray catches. Fifty-nine fishing boats with eight different types of gear were approached to see if any sharks and/or rays were caught, including drifting (75%), anchored (12%) and fixed (10%) gillnets, and seine nets (3%).

During these at-sea investigations, WCS documented four EN Giant freshwater whiprays *Urogymnus polylepis* in drifting and fixed gillnets and a VU Bengal whipray *Brevitrygon imbricata* in a drifting gillnet. Both these species along with CR Sharpnose guitarfish and EN Round *Maculabatis pastinacoides*, Whitespotted *Maculabatis gerrardi*, Honeycomb whiprays, Zonetail butterfly rays *Gymnura zonura*, and NT Spadenose sharks were documented during visits to ten fish landing sites in the survey area.

Between 24 November 2021 to 13 February 2022, WCS documented 41 fish landing sites while conducting an interview survey with 150 local fishers and traders along the coast between the Sundarbans and Nijhum Dwip. Forty-three percent of the fishers interviewed stated they sell their shark and/or ray catches to local small traders, followed by 41% who sell to moneylenders, and 8% directly to local consumers, 4% to dry fish processors, 3% to a vessel-based buyer, and 1% didn't respond. The interviewees reported that, due to the high number of juveniles regularly caught in nearshore shallow waters around islands and mudflats (chars), they suspected these waters are used as nursery grounds by several ray species.

Perceptions of small-scale fishers on sharks and rays in the coastal waters of Bangladesh

As detailed in the 3rd progress report, during interview surveys conducted by WCS from November 2021 to February 2022 along the coast between the eastern edge of the SRF and Nijhum Dwip, fishers and traders (N=150) identified 28 shark and 52 ray species caught in their fishing gear which they identified from images shown to them. Note that some species mentioned by interviewees (indicated with*) are suspected to occur in Bangladesh but have not been confirmed. Of the reported sharks, five species, including Pondicherry *Carcharhinus hemiodon**, Sand tiger *C. taurus**, Ganges, Scalloped hammerhead, and Great hammerhead sharks are considered CR, with the remaining species EN (4), VU (13) and NT (6). Of the reported rays, ten are considered CR, including Sharpnose guitarfish, Widenose guitarfish, Clubnose guitarfish *G. thoun*, Giant guitarfish, Tentacled butterfly rays *Gymnura tentaculate**, Bowmouth guitarfish, Smoothback guitarfish, Annandale's guitarfish *Rhinobatos annandalei*, Bottlenose wedgefish *Rhynchobatus australiae*, and Smoothnose wedgefish *Rhynchobatus laevis*, with the remaining species EN (19), VU (16), NT (2), Least Concern (LC) (2), DD (2), and Not Evaluated (1) in the Global IUCN Red List. Forty-seven or roughly one-third of the fishers reported catching 110 CR sawfish (Family Pristidae) in the past ten years, of which 105 were immature (<300 cm long), mostly in medium-mesh drifting gillnets (90%).

According to the interviewed fishers and traders, small rays such as VU Bengal and NT Scaly whips *Brevitrygon walga*, as well as juveniles of other species, are usually discarded alive at sea, while larger high-value rays such as CR Rhino rays *Rhinobatos* sp. and *Glaucostegus* sp., Eagle rays *Aetomylaeus* sp., and VU Leopard *Himantura leoparda*, and EN Giant freshwater and Bleeker's *Pateobatis bleekeri* whips, which fetch a higher price, are retained and sold to local traders or money lenders.

About 18% of interviewed fishers and traders stated that sharks and rays were targeted using baited and unbaited longlines. Most interviewees reportedly caught sharks and rays unintentionally, but three fishers reported catching them intentionally. The majority (73%) understood the need to protect and promised to release legally regulated sharks and rays caught in their fishing gear that are found still alive, while 25% objected, citing the high prices they can sell them for in local markets, and three preferred not to answer the question. To reduce mortalities of threatened sharks and rays, these fishers and traders suggested banning the use of unbaited bottom-set longlines (17%), anchored gillnets (17%), and estuarine set-bag nets (3%).

Between December 2021 and January 2022, WCS also conducted nine at-sea interviews with fishermen operating estuarine set-bag nets (5), small-mesh drifting gillnets (2), baited mid-water (1) and unbaited bottom-set longlines (1) around Dubla Island to better understand shark and ray catches and their knowledge, attitudes, and practices about threatened marine wildlife, particularly sharks and rays.

The nine interviewed fishers identified CR Sharpnose guitarfish, EN Bleeker's whiplay, VU Round and Bengal whiplays, Longtail butterfly rays, and NT Spadenose sharks as among the species most often caught in their gear. Three fishermen reported catching CR sawfish in the past five years, two weighing about 100 kg each in estuarine set-bag nets, and one weighing about 50 kg in a medium-mesh drifting gillnet. Four fishermen had heard about other fishers catching sawfish in the past five years in set-bag nets. One fisherman reported hearing about sawfish weighing about 1,000 kg being caught in trawls, while another claimed sawfish weighing about 400-520 kg were caught in a medium-mesh drifting gillnet.

Three of the nine fishermen interviewed at-sea around Dubla Island reported sharks and rays being targeted by longlines. Six fishermen said they had accidentally caught sharks and rays in their gear, and one said he targeted sharks and rays. While one fisher observed no change in shark and ray catches, six fishers reported a decline in number of sharks and rays caught during the previous 5-10 years, and three reported a reduction in specimen sizes. Five of the nine fishers who were interviewed said that no changes to set-bag nets were necessary to reduce shark and ray catches.

Investigation of shark and ray catches in commercial trawlers

As detailed in the 3rd progress report, with the consent of the Marine Fisheries Director, WCS team members, together with three senior Fisheries Inspectors from the DoF visited the Chattogram port between 11-13 February 2022 to gain a better understanding of industrial fishery catches and landings of sharks and rays.

Eleven inspectors are appointed by the Marine Fisheries wing of the DoF to collect fish catch records/logbooks from industrial trawling vessels and cross-check entries with the catches being unloaded. They work in four groups with three inspectors each visiting industrial trawlers between 1-4 times a month or less depending on ancillary work requirements. Inspectors informed us that they never enter the cold storage area for health and safety reasons. They were seen giving fishing vessel captains notices at the end of inspections, informing them that, according to the Wildlife (Conservation and Security) Act, 2012, “*No mammal or protected sharks and rays can be targeted, and bycatch should be reported to the Marine Fisheries Department.*”

Catch information from industrial trawls is recorded in the official daily fishing log provided by the Marine Fisheries Office (MFO) of the DoF. Despite no entries in the fishing logs, we examined about catches of sharks and rays and found protected species in two of the five vessels we visited, indicating that not all caught individuals are recorded in the fishing logs. The boat owners told us that they often sell sharks and rays along with bony fish if they have small quantities, but they sell large quantities of sharks and rays to specialized traders.

The trawler captains and officers informed us that they do not know about shark and ray species identification. To solve this problem, they suggested that we provide them with training on species identification. The DoF inspectors also suggested we provide them with training so that they can inspect the boat more effectively for sharks and rays, and that they could share the specimen pictures with us via the WhatsApp phone application for species confirmation.

Domestic and international trade of shark and ray products in Bangladesh

As detailed in the 3rd progress report, WCS summarized and analyzed information from Government statistics, published reports, and from interviews conducted by WCS with shark and ray fishers, traders, and consumers as reported in the *Shark and Ray Assessment Report*. Additional insights on domestic trade and consumption of shark and ray products were gathered during at-sea and land-based investigations conducted under the SUFAL shark and ray consultancy assignment.

Between December 2021 and January 2022, WCS conducted an interview survey with 28 dry fish processors and traders on Dubla Island and adjacent fish landing and processing sites in the SRF. Traders purchase fresh sharks and rays from these landing and processing sites for sale in Chattogram. Dried Spadenose sharks sell for 400 to 600 BDT (4.3 to 6.4 USD) per kg and dried Bleeker's whiprays for 500 to 600 BDT (5.4 to 6.4 USD) per kg. Between November 2021 and January 2022, one trader reported transporting 720 kg of dried shark and ray meat in three shipments, another trader transported 550 kg in two shipments, and a third trader transported 55 kg in one shipment, all caught in set-bag nets and for sale in Chattogram.

Two of the nine fishermen interviewed by WCS during at-sea investigations around Dubla Island (see above), both operating estuarine set-bag nets, reported having an agreement with a businessman at the Dubla fish landing site to sell him sharks and rays, and one fisher using baited mid-water longlines claimed to have a deal with a businessman at the Alipur fish landing site to sell him sharks and rays.

Investigations conducted by WCS in the area between the SRF and Nijhum Dwip (see above) showed that large-sized rays fetch a good price in Mohipur, Alipur, or Kuakata. Smaller rays, such as butterfly and whiprays, are mostly consumed locally. People who have returned from Oman, where sharks and rays are apparently part of the traditional diet, living on Hatiya and Nijhum Dwip were identified as the largest consumer group for ray meat in this region. In Monpura, rays are primarily consumed by fishers and their families. Rays are in high demand at the local market on Charfasson, with fisherfolk, poor Muslims, and many Hindus from Char Montaz and Rangabali consuming rays.

Sharks and rays, as well as marine and freshwater turtles, are commonly consumed by the approximately 800 and 640 Buddhist ‘Mog’ families living in Kuakata and Taltali, respectively. In Kuakata, rays of various species, including EN Javan cownose rays *Rhinoptera javanica*, Butterfly rays *Gymnura sp.*, and other small-sized stingrays, are sold to tourists.

Floating fishers from the ‘Boirali’ community believe that ray meat helps treat bacillary dysentery and enhances sexual stamina, shark liver oil helps arthritis, and eating guitarfish meat enhances lactation in breastfeeding women. The Boirali people eat, process, preserve, and sell dried ray meat, shark liver oil, and dolphin oil as medicinal remedies.

Predictive mapping and a spatial assessment of bycatch risk for sharks and rays from data collected by a citizen science network of coastal gillnet fishermen

As reported in Chapter 2 of the *Shark and Ray Assessment Report* prepared by WCS and submitted to the SUFAL PMU with the first progress report July 2021, georeferenced shark and ray catch records from coastal small-scale gillnet fishers participating in the WCS *Citizen Science Fishermen Safety Network* were used to generate maps of the predicted distribution of sharks and rays.

Based on the geographic locations of 677 shark catches, their most suitable habitat is predicted to be in the nearshore shallow (<100 m) waters offshore the SRF and adjacent deeper waters (> 500 m) in and around the Swatch-of-No-Ground (SoNG) MPA (Figure 3 - top). Waters around the Saint Martin’s Island, which were declared as an MPA by the Ministry of Environment, Forest and Climate Change (MoEFCC) in January 2022, based on a proposal prepared by the BFD with technical support from WCS, also showed high to medium suitability for sharks. The map for the predicted distribution of rays based on the geographic locations of 381 ray catches, showed that the most suitable habitat is in the shallow estuarine and nearshore waters extending from the western to central coast, including the southern extent of the SRF and the SoNG and Nijhum Dwip MPAs (Figure 3 – bottom). The Saint Martin’s MPA encompasses an area of medium suitability for rays.

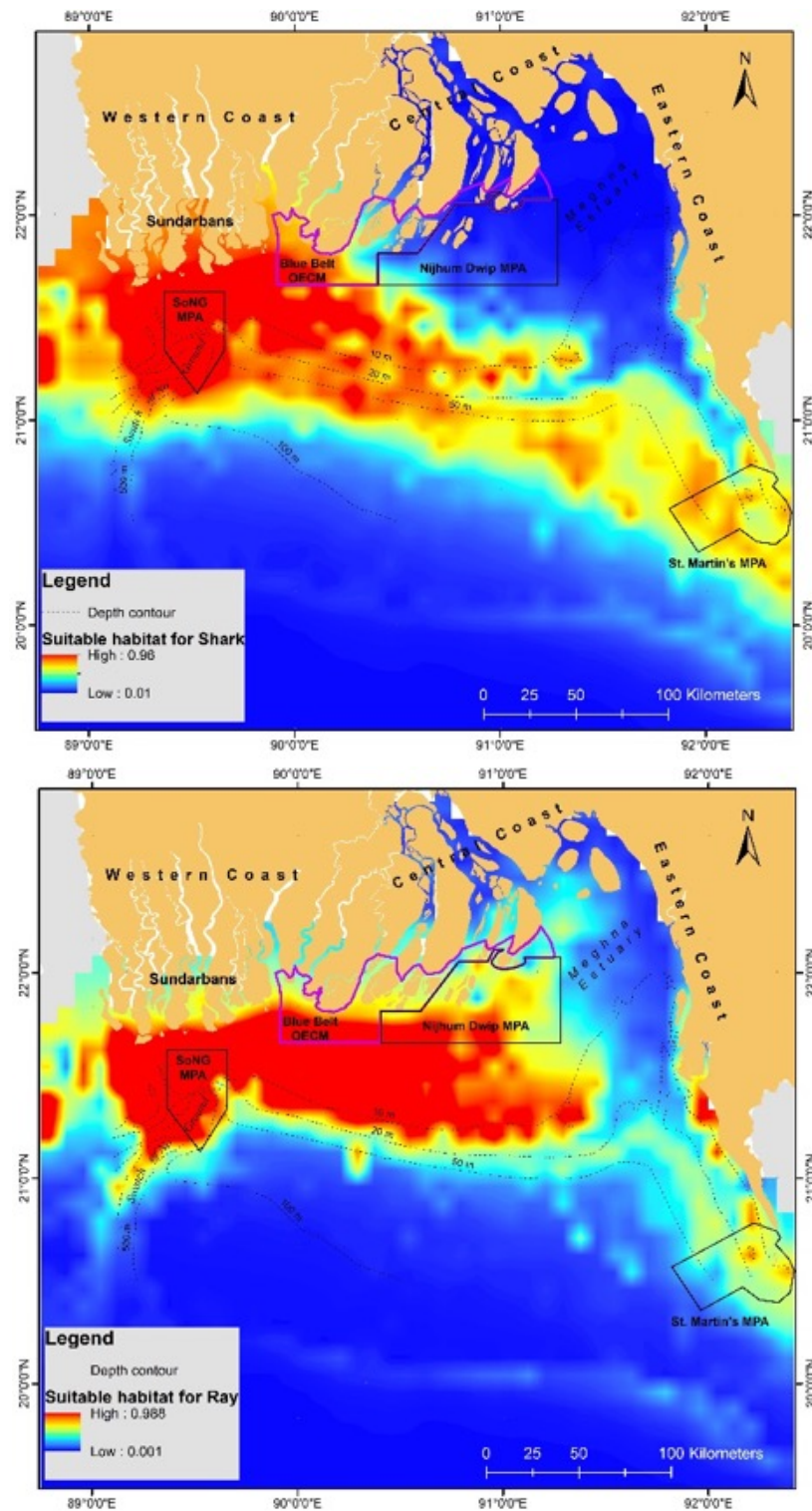


Figure 3. Habitat suitability models for sharks (top) and rays (bottom) based on catch data from the WCS *Citizen Science Fishermen Safety Network* confirm the importance of existing MPAs, indicate the need for other effective area-based conservation measures (OECMs), and were used to inform spatially explicit management recommendations.

2. Submit a baseline status report and threat assessment of sharks and rays

As per contractual agreement, WCS prepared and submitted the *Shark and Ray Assessment Report* (SAR) in July 2021 with the first progress report to the SUFAL PMU. The comprehensive background document provides an up-to-date baseline status report and threat assessment of sharks and rays based on results from scientific investigations, educational outreach, and policy related activities conducted by WCS in partnership with citizen scientists and government agencies, and information from published reports (Figure 4).

The SAR presents information on shark and ray diversity and landings from small-scale coastal fisheries in Bangladesh, including details on taxonomy and species occurrence, seasonal variations, and fishing gear types responsible for the catches, as well as on size distribution, economic value, and conservation status. Predictive mapping and spatial bycatch risk assessments underline the importance of the Nijhum Dwip and SoNG MPAs with a potential expansion for spatial protection of priority shark and ray habitats. Insights on fisheries practices and gear information, catch characteristics, and size distribution, as well as a study on the perceptions of small-scale fishers on sharks and rays in the coastal waters of Bangladesh indicate potential fisheries management approaches to reduce shark and ray mortalities in return for increased at-sea safety and livelihood support for fishers. Current fishing gear regulations for marine waters, domestic and international trade in shark and ray products, and institutional and legal frameworks for the conservation and management of sharks and rays, along with replicable approaches for raising public awareness and compliance, are described in the comprehensive background document.

The contents of the SAR were presented to and enriched with inputs from national experts during the two-day long *National consultation for sharing knowledge on the status of and threats to sharks and rays in Bangladesh and developing a national conservation strategy* conducted online in May 2021. Proceedings from the online consultation with more than 50 participants and 19 speakers sharing knowledge on the status of and threats to sharks and rays and discussing strategies and recommended actions for improving shark and ray conservation management in Bangladesh are presented in a separate report also submitted with the first progress report to the SUFAL PMU in July 2021.

The SAR was used to inform the *National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh* (NCS/NPOA-Sharks & Rays) prepared under the SUFAL shark and ray consultancy assignment, with suggested governance frameworks and interventions for improving protection of the most endangered sharks and rays, ensuring that the exploitation of non-threatened species does not result in them becoming threatened, sustaining productive fishery livelihoods, and sustainable financing mechanisms for implementing

conservation management. The SAR was also used to inform the NDF assessments conducted under the SUFAL shark and ray consultancy assignment.

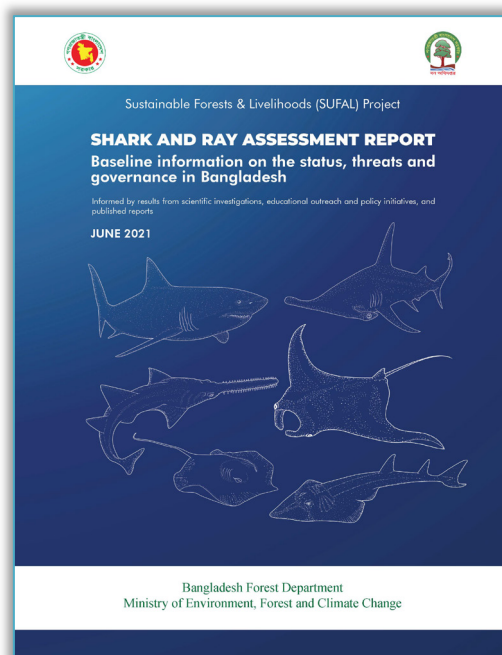


Figure 4. The comprehensive *Shark and Ray Assessment Report* was submitted in July 2021 and resubmitted after adjustments were made as per SUFAL PD directives in July 2022.

CITES Resolution Conf. 12.6 encourages Parties to provide a SAR for evaluating progress made towards developing and implementing a *National Plan of Action for Shark and Ray Conservation and Management* (NPOA-Sharks) as prescribed by the Food and Agriculture Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries (COFI) *International Plan of Action for Conservation and Management of Sharks* (IPOA-Sharks), CMS, and Indian Ocean Tuna Commission (IOTC). The SAR prepared under the SUFAL shark and ray consultancy assignment complies with these international directives and commitments. It is therefore recommended, that the National CITES Management Authority share the SAR with the CITES and CMS Secretariats as well as with the DoF for submission to the IOTC.

3. Identify priority species for conservation management and conducting CITES Non-Detriment Findings (NDFs)

WCS was contracted by the BFD under the SUFAL consultancy assignment to develop NDFs for two CITES Appendix II listed species, one shark and one ray. The criteria for identifying priority species for CITES NDF assessments include their confirmed occurrence in Bangladesh, that they were not assessed as Critically Endangered in the IUCN Global Red List, and the

availability of sufficient catch or landing data, which were presented in the inception report submitted by WCS in February 2021 and approved by the SUFAL PMU in May 2021, to conduct a rigorous assessment.

Of the 12 CITES Appendix II listed shark species confirmed or suspected to occur in Bangladesh, six have never been recorded in the catches or landings monitored by WCS. Only the Silky shark *Carcharhinus falciformis* and Smooth hammerhead shark, both assessed as VU in the IUCN Global Red List, had sufficient information on catches and landings, which meant that they were identified as suitable candidate species for conducting an NDF assessment.

All 13 ray species listed in CITES Appendix II and confirmed as occurring in Bangladesh belong to two globally threatened species groups: EN Manta and Devil rays, also known as Mobulid rays (Mobulidae), and CR Giant guitarfishes (Glaucostegidae) and Wedgefishes (Rhinidae), also known as Rhino rays. Since we had sufficient information on the catches and landings for preparing NDF assessments on both these species groups, we conducted one NDF assessment for all Mobulid rays and one for all Rhino rays.

The *Report on the Development and Validation of Non-Detriment Finding (NDF) Assessments for CITES Appendix II listed Silky Shark, Smooth Hammerhead Shark, Mobula Rays, and Rhino Rays for Bangladesh*, submitted by WCS to the SUFAL PMU along with the 3rd Progress Report in July 2022, details the NDF assessment process and results, including evidence-based guidance for improving conservation management to ensure that international trade will not negatively impact species survival in the wild.

4. Develop a report on actions needed for the conservation of threatened sharks and rays and the sustainable exploitation of species not in immediate danger of extinction

Locally feasible actions for the conservation of threatened sharks and rays and the sustainable exploitation of species not in immediate danger of extinction were formulated based on results in the SAR, which were refined during a two-day consultative workshop conducted in May 2021 with national experts from government agencies, research institutions, academia, and development and conservation NGOs. Recommended actions were validated and enhanced during a second consultation conducted in November 2021 with 30 local shark and ray fishery stakeholders in Kuakata, along with results from field research and standardized interviews with 150 fishers conducted by WCS from December 2021 – February 2022 and enriched with threat mitigation recommended in NDFs prepared under the SUFAL shark and ray consultancy assignment.

Priority actions were detailed in the first draft conservation strategy document submitted by WCS in July 2021. These included measures to (i) Reduce mortalities of threatened sharks and rays, (ii) Protect priority shark and ray habitat, (iii) Strengthen legal protection and enforcement, (iv) Engage fishing communities in shark and ray protection, (v) Improve reporting and monitoring of shark and ray catches, landings, and trade, and (vi) Strengthen governance and coordination. As per comments from the SUFAL PMU, received in August 2021, planned actions were summarized in a matrix enriched with further details on resource requirements, possible sources of funding, lead agencies or institutions for their implementation, projected outcomes, and performance indicators (Appendix 3).

To comply with CITES, CMS, FAO, and IOTC requirements for member states to develop and implement a National Plan of Action (NPOA) for sharks and rays, the report on recommended actions for the conservation of threatened sharks and rays and the sustainable exploitation of species not in immediate danger of extinction was incorporated into the *National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh 2023-2033* (NCS/NPOA-Sharks & Rays). In June 2021, the draft NCS/NPOA-Sharks & Rays was presented and discussed during a third consultation with senior representatives from relevant government ministries, agencies, and institutions. As per contractual agreement, in July 2022, the NCS/NPOA-Sharks & Rays was submitted to the SUFAL PMU/BFD for pursuing government endorsement.

5. Conduct NDFs for priority shark and ray species considering their economic importance, conservation status, and available data

NDFs are science-based species- or genera-specific risks assessments required to verify that international trade will not negatively impact the survival of CITES Appendix II listed species or species groups in the wild. The NDF process evaluates the intrinsic biological vulnerability and conservation concern, trade and fishing pressures, and existing management measures along with associated compliance. NDFs also help support the development or implementation of shark-and-ray-specific fisheries management to prevent declines and enable recovery of a species, thereby supporting sustainable trade (Figure 5).

With technical support from WCS under the SUFAL shark and ray consultancy assignment, the BFD conducted four CITES NDF assessments. These NDFs, the first done in Bangladesh, were developed by 22 nominated representatives from the BFD, DoF, Bangladesh Fisheries Research Institute (BFRI), University of Dhaka (DU), and Sher-e-Bangla Agricultural University (SAU) during two intensive three-day workshops organized by WCS in February 2022 in Chattogram and Dhaka. The NDF process was facilitated by international CITES shark and ray expert Daniel Fernando using an e-NDF template and informed by input provided by national fisheries and wildlife experts, research institutions, and WCS.

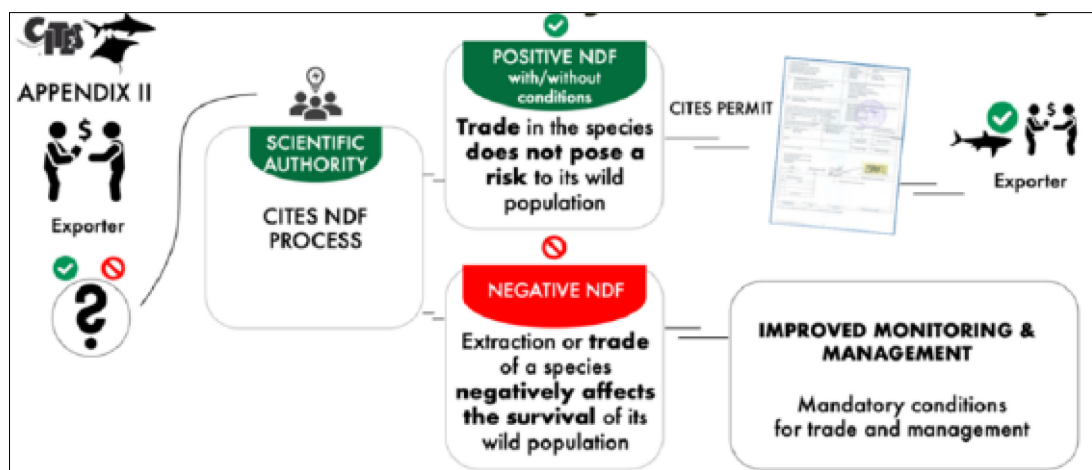


Figure 5. NDFs verify that international trade will not negatively impact the survival of a CITES Appendix II listed species or species group and provide guidance for management measures needed to ensure the survival of species or species groups in the wild.

The resulting NDF assessments, along with the recommended mitigation measures, were validated in a workshop also convened in February 2022 by 33 national fisheries and wildlife experts, including the heads and senior representatives from the BFD and DoF. They were approved for submission to the CITES Secretariat by the Scientific Committee in a meeting held on 28 February 2022 and presented for MoEFCC endorsement at the *Third National Consultation on the National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh and CITES Non-Detriment Findings* in June 2022 (Figure 6).

NDF assessments for CITES Appendix II listed Silky sharks, Smooth hammerhead sharks, Mobulid rays (*Mobula mobular*, *M. kuhlii*, *M. tarapacana*, *M. thurstoni*, *M. eregoodoo*, and *M. birostris*), and Rhino rays (Families Glaucostegiidae and Rhinidae) were developed under the SUFAL shark and ray consultancy assignment.

Due to evidence that trade is not affecting the survival of Silky sharks, the NDF assessment for this species resulted in a positive finding with the condition that traded specimens are at least 200 cm long which is their length at sexual maturity. This NDF is valid for two years, after which it should be re-evaluated.

Due to evidence of overexploitation and international trade negatively affecting the survival of wild populations, the NDF assessments for Smooth hammerhead sharks, Mobulid rays, and Rhino rays resulted in negative findings, with key recommendations made for improving their conservation status in Bangladesh. The results of the NDF process for these species are consistent with, and provide the scientific justification for, the recently amended *Wildlife (Conservation and Security) Act, 2012*, where these species are strictly protected under Schedule I.

The management and conservation actions proposed in these NDFs, which aim to prevent further population declines and promote the recovery of these species/species groups, were incorporated in the NCS/NPOA-Sharks & Rays. Implementing these actions will also promote the conservation of other threatened shark and ray species in Bangladesh waters. Mitigation measures and recommendations resulting from the NDFs for (i) research, (ii) awareness and training, (iii) national, regional, and international policy and governance, and (iv) monitoring and reporting are summarized in Appendix 4.

The NDF development workshops also served as a training opportunity to enable national experts, including officers from the BFD and DoF, to conduct additional NDFs in the future for both marine and terrestrial species as per international standards (see Section 8). Details on the NDF development process and workshop proceedings are presented in the *Report on the development and validation of Non-Detriment Finding (NDF) assessments for CITES Appendix II listed Silky Shark, Smooth Hammerhead Shark, Mobula Rays, and Rhino Rays for Bangladesh*, which was submitted with the third progress report. This report provides guidance for conducting future NDF assessments, and it highlights Bangladesh's commitment to improve the sustainability and traceability of international trade in threatened sharks and rays as a legal obligation of CITES member countries.



Figure 6. Four NDFs were developed by national experts during two 3-day-long workshops (top left), validated by senior representatives from relevant agencies (top right), endorsed by the Scientific Committee (bottom left), and presented at an inter-ministerial consultation (bottom right).

The four NDF assessment documents (Figure 7) were submitted to the National CITES Management Authority, along with a draft cover letter to inform the CITES Secretariat of the results and request notification of all CITES Parties of the zero-export quota for Smooth hammerhead sharks, Mobulid rays, and Rhino rays from Bangladesh.



Figure 7. Bangladesh’s first four NDF assessments for CITES Appendix II sharks and rays were developed under the SUFAL shark and ray consultancy assignment for submission to the CITES Secretariat.

6. Formulate a National Conservation Strategy for the conservation management of sharks and rays in partnership with government and community stakeholders

The development of a national conservation strategy for the conservation management of sharks and rays and recommended actions needed for the conservation of threatened sharks and rays and the sustainable exploitation of species not in immediate danger of extinction was completed by WCS, in partnership with government and community stakeholders, under the SUFAL shark and ray consultancy assignment.

A first draft of the conservation strategy, developed using up-to-date information on the status, threats, and governance frameworks for sharks and rays in Bangladesh and formulated in consultation with government stakeholders, academia, and conservation and development experts, was presented in the SAR (see Section 2 above) and submitted to the SUFAL PMU in July 2021. It was then revised according to comments received from the SUFAL PMU and resubmitted in September 2021 (see Section 7 below).

Proposed improvements for strengthening the conservation management of sharks and rays in Bangladesh were refined in a second consultation with local shark and ray fishery stakeholders, including fishing vessel captains, fishers, and traders, in November 2021. The draft *National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh* (NCS/NPOA-Sharks & Rays) was approved and shared for external review by the SUFAL PMU in December 2021. A working group, including representatives from the BFD and WCS, formed by the Ministry of Fisheries and Livelihood (MoFL), provided additional technical support and comments on the NCS/NPOA-Sharks & Rays in four formal meetings. Sustainable financing mechanisms for implementing the strategic actions, including Government budget allocations, offset financing, existing or new trust funds, contributions from private sectors, and budget estimates provided by the SUFAL DPD were proposed for inclusion in January 2022 (see 2nd Progress Report).

All comments received from national experts, the CCF, and the SUFAL PMU were incorporated in a revised version of the NCS/NPOA-Sharks & Rays presented to 41 senior ministry and government agency representatives, including from the MoEFCC/BFD, MoFL/DoF/BFRI/BFDC, Ministry of Commerce, National Board of Revenue/Customs, Navy, Coast Guard, and Police, at a third consultative workshop in June 2022 (Figure 8). The consultation participants, including the Chief Guest, Md. Shahab Uddin, Member of Parliament and Honorable Minister MoEFCC; Chair, Dr. Farhina Ahmed, Secretary MoEFCC; Special Guest, Iqbal Abdullah Harun, Additional Secretary (Admin) MoEFCC; Special Guest, Md. Amir Hosain Chowdhury, CCF BFD; and Special Guest, Kh. Mahbubul Haque, DG DoF, expressed their satisfaction with the document and promised to support its official endorsement and implementation. Comments

from participants reinforced the proposed actions in the NCS/NPOA-Sharks & Rays, such as strengthening the Wildlife (Conservation and Security), Act 2012, through additional amendments, capacity building, and interagency coordination.

Further details on the collaborative development of the NCS/NPOA-Sharks & Rays, including comments provided during the third National Consultation (Figure 8), are provided in the 3rd Progress Report submitted along with the NCS/NPOA-Sharks & Rays finalized in July 2022 for government endorsement.



Figure 8. High-level government officials attended the *National Consultation on the National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh and Non-Detrimental Findings* on 19 June 2022, including Mr. Iqbal Abdullah Harun, Additional Secretary MoEFCC (top left) and senior officers from the DoF and BFD (top right). Honorable Minister Md. Shahabuddin of the MoEFCC and Member of Parliament, and Dr. Farhina Ahmed, Secretary MoEFCC, engaged in a discussion with Md. Amir Hosain Chowdhury, CCF and the team leader of the SUFAL shark and ray consultancy assignment, and Elisabeth Fahrni Mansur, WCS Senior Marine Program Manager (bottom).

The NCS/NPOA-Sharks & Rays fulfills Bangladesh's commitment to CITES, CMS, and IOTC for developing and implementing an NPOA for conservation and management of sharks and rays guided by the FAO IPOA-Sharks. This document is based on the most up-to-date information available and has been reviewed by more than 50 national experts from government and non-government institutions, who provided inputs at the onset of the SUFAL shark and ray consultancy assignment and had the opportunity to comment on the revised draft, as well as several international experts. Through this inclusive and transparent development process, broad support for its implementation has been generated across the Government of Bangladesh agencies, departments, and ministries as well as universities and NGOs.

WCS is prepared to provide technical support beyond the SUFAL assignment for pursuing government endorsement and implementation of the NCS/NPOA-Sharks & Rays. In line with commitments to CITES, CMS, FAO, and IOTC, it is recommended that after official approval the document be shared on the MoEFCC/BFD websites and with CITES, CMS and IOTC.

7. Suggest governance frameworks to strengthen the conservation of threatened sharks and rays and the sustainable exploitation of non-threatened species

To ensure the survival of globally threatened shark and ray species and their ability to maintain their ecological roles as large, mobile predators, all Hammerhead sharks, and all Mobulid and Rhino rays, along with three other genera and 23 species of sharks and rays were granted strict protection under Schedule I of the Wildlife (Conservation and Security) Act, 2012. The amended listing of eight genera and 23 species of sharks and rays under Schedule I and one genus and 29 species of sharks and rays under Schedule II of the Bangladesh Wildlife Act was officially gazetted by the Ministry of Environment, Forests and Climate Change (MoEFCC) in September 2021. Bangladesh is the first country to grant full protection to all Rhino ray species.

The SAR prepared by WCS under the SUFAL shark and ray consultancy assignment (see above) provides an overview of current governance frameworks, including agency mandates, national policies, and regional as well as international commitments to conserve threatened shark and ray species and manage the sustainable exploitation of non-threatened species. In this comprehensive baseline report, gaps in legislation and regulatory frameworks were identified and regulatory recommendations from published references summarized.

Informed by the results from scientific investigations, educational outreach and policy initiatives, and published reports, the SAR was presented and enriched with inputs from national experts in a two-day online consultation. More than 50 participants and 19 speakers from Government agencies and institutions, academia, and NGOs shared their knowledge on

the status of and threats to sharks and rays and discussed strategies and recommended actions for improving shark and ray conservation management in Bangladesh. A *Report on the National consultation for sharing knowledge on the status of and threats to sharks and rays in Bangladesh and developing a national conservation strategy* was submitted by WCS to the SUFAL PMU with the First Progress Report in July 2021.

In a second consultative workshop held in November 2021, proposed improvements to governance frameworks for strengthening the conservation management of sharks and rays in Bangladesh, which include scaling-up effective models for regulatory and policy changes, engaging law enforcement and communities, and novel incentives to assist in poverty reduction in shark and ray dependent coastal communities, were discussed with 30 local shark and ray fishery stakeholders in Kuakata. Details on this consultation and resulting recommendations are presented in the *Report on the 2nd consultation workshop with fishers, fishing vessel owners, and traders engaged in shark and ray fisheries, processing, and trade, for sharing knowledge on the status of and threats to sharks and rays for a national conservation strategy* submitted by WCS to the SUFAL PMU with the 2nd Progress Report in January 2022.

Recommendations resulting from these two consultations and additional suggestions from technical training workshop participants, national experts, NDF assessments, and the 3rd National Consultation with senior government representatives are incorporated in the NCS/NPOA-Sharks & Rays. These include (i) improving the legal recognition of compliant fishers, (ii) enabling their access to government and non-government support systems and training opportunities, (iii) sustaining and equitably allocating government provisions during fishing ban periods, (iv) improving fishery stakeholder engagement through participatory management, and (v) strengthening engagement with regional and international fora for improved regulation, compliance, and transparency of shark and ray fisheries and trade.

In summary, the SUFAL shark and ray consultancy assignment substantially contributed to enhancing existing frameworks and enabling their adaptation through strengthened interagency collaborations, technical capacity, and mass awareness (see below). One example is a request from the Marine Fisheries Office of the DoF for WCS to assist them with formulating Marine Fisheries Rules under the new Marine Fisheries Act 2020 that align with shark and ray species protections under the Wildlife (Conservation and Security) Act, 2012, recommendations in the NCS/NPOA-Sharks & Rays, and export/import procedures as per CITES requirements.

8. Develop technical capacity and awareness, and foster increased commitment, political will, and financial investment for the conservation management of sharks and rays across multiple sectors

Throughout the SUFAL consultancy assignment, WCS developed and strengthened institutional capacity and collaborations for improving the conservation management of sharks and rays.

Fostering commitment, collaborations, and political will for improved shark and ray conservation management through briefings of key collaborators

At the onset of the SUFAL shark and ray consultancy assignment, WCS briefed 13 key officers from the DoF, BFRI and BFDC about project objectives, planned activities, and opportunities for strengthening technical capacities and collaborative development of a *National Conservation Strategy and Plan of Action for the Conservation Management of Sharks and Rays in Bangladesh* and NDFs for priority CITES Appendix II listed shark and ray species. The SUFAL initiative for sharks and rays was appreciated and activities of the project were supported by these agencies.

Communications with key government representatives were maintained throughout the assignment to ensure broad support and institutional collaboration (Appendix 5). Senior representatives from the MoEFCC, MoFL, DoF, BFD, Ministry of Commerce, Customs, BFRI, BFDC, Navy, Coast Guard, and Bangladesh Police were informed about activities and achievements during the *National Consultation on the National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh and CITES Non-Detriment Findings* (see above). In particular, Dr. Farhina Ahmed (Secretary) and Mr. Iqbal Abdullah Harun (Additional Secretary) from the MoEFCC expressed their appreciation of the SUFAL consultancy assignment outcomes and support for endorsement and collaborative implementation of the NCS/NPOA-Sharks & Rays. These commitments reflect strong political will to prioritize shark and ray and associated species conservation as part of a healthy ocean for healthy people.

Building technical capacity for identifying protected sharks and rays and their parts through interagency trainings

A total of 95 government officers and fish landing site data collectors participated in four intensive two-day long technical training workshops. Mid-level officers from the BFD, including from the Wildlife Crime Control Unit (WCCU), DoF, BFDC, and Customs, were trained in the identification of CITES-listed sharks and rays and their commonly traded products, standardized data collection protocols for sharks and rays at fish landing sites, procedures for detection and confiscation of CITES-listed sharks and rays and their products, and the prosecution of illegal shark and ray traders. Field-level officers and citizen scientists were

trained in identifying CITES and Wildlife Act listed sharks and rays and their products, collecting data using standardized protocols and procedures, safely releasing legally protected marine wildlife, and using a GPS for safe navigation and collecting information on the locations of fishing gear deployment and retrieval.

Twenty mid-level officers and 29 field-level officers and citizen scientists engaged in the WCS *Citizen Scientist Landing Data Collection Network* participated in the two trainings conducted between 24 and 28 October 2021 in Chattogram, and 20 mid-level officers and 26 field-level officers and citizen scientists in the two training workshops between 31 October and 3 November 2021 in Khulna.

The hands-on approach developed for these interagency trainings proved highly effective. Using materials developed under the SUFAL shark and ray consultancy assignment, several of the trained officers from the BFD and DoF reportedly arranged additional trainings for their constituencies, indicating the effectiveness of the training programs and tools for a wide audience of ocean stakeholders. For documentation and to encourage further replication of these programs, details on the technical training workshops, including agendas, session plans, and participant lists, are presented in the *Report on Technical training workshops on shark and ray data collection and monitoring for field and mid-level government officers* submitted to the SUFAL PMU by WCS along with the 3rd Progress Report in July 2022.

An opportunistic training request aligning with the SUFAL consultancy assignment objectives was accommodated by WCS in November 2021, when the *Kuakata Dolphin Rokkha Committee* invited WCS to train their members as first responders to dolphin strandings and mortalities. Given that cetaceans are associated species of sharks and rays and WCS's extensive experience with cetacean research and conservation, we trained 24 local volunteers, including tour operators, tour guides, journalists, fishers and fishing vessel owners, businessmen, students, and a BFD assistant range officer from Mohipur, to identify cetacean species and report strandings. In May 2022, a committee member who had attended our basic training, shared photographs confirming the discovery of a Dwarf sperm whale – a new species record for Bangladesh.¹

Enhancing technical capacity of national fisheries and wildlife experts for conducting NDF assessments

Under the SUFAL shark and ray consultancy assignment, twenty-two national fisheries and wildlife experts were trained on developing NDF assessments for sharks and rays. Two intensive three-day workshops were facilitated by international CITES shark and ray expert Daniel Fernando and WCS Bangladesh staff. This learn-by-doing approach resulted in the

¹ <https://newsroom.wcs.org/News-Releases/articleType/ArticleView/articleId/17570/Local-Responders-Confirm-a-Dwarf-Sperm-Whale--A-New-Species-in-Bangladesh.aspx>

completion of four NDFs for CITES Appendix II listed shark and ray species/species groups (see above) with national experts enabled to conduct additional NDFs in the future.

As a follow-up to the SUFAL assignment, in September 2022, WCS will be facilitating two additional NDF assessments with experts who participated in the workshops conducted under the SUFAL shark and ray consultancy assignment. In agreement with the CCF, one NDF assessment will be conducted for requiem sharks, including Graceful (*Carcharhinus amblyrhynchoides*), Spinner (*C. brevipinna*), Blacktip (*C. limbatus*), Hardnose (*C. macroti*), Blacktip reef (*C. melanopterus*), and Spottail (*C. sorrah*) sharks, that are regulated under Wildlife Act Schedule II. Bangladesh is co-sponsoring a proposal at the upcoming CITES Conference of Parties (CoP19) in November 2022 to list these species in CITES Appendix II due to the need for regulating trade to ensure that the exploitation of these species does not threaten wild populations. Also, with support from the CCF, another NDF assessment will be developed for Near Threatened Tiger sharks (*Galeocerdo cuvier*). Although this species is not regulated for international trade under CITES, it is listed in Schedule II of the Bangladesh Wildlife Act, landed in relatively large numbers in Bangladesh, and valued in the international fin trade. Development of these NDF assessments will further enhance national capacity, following international guidelines and standards, developed under the SUFAL shark and ray assignment.

Supporting technical capacity and commitment through mentoring

WCS communicated with key government and non-government partners for improving shark and ray conservation management in Bangladesh throughout the SUFAL consultancy assignment. An overview of communications between WCS and government officers under the SUFAL shark and ray consultancy assignment (January 2021 – July 2022) aimed to strengthen interagency coordination and collaborations is provided in Appendix 5.

Between January 2021 and July 2022, WCS team members initiated regular phone calls and visits with government officers from the BFD, WCCU, DoF, BFRI, BFDC, and Customs. In addition to the briefings, formal meetings, training workshops, and consultations (Figure 9), WCS responded to several requests from law enforcement officers for verifying the identification of shark and ray species and their protection status, based on photographs shared via the WhatsApp mobile phone application. Our assistance supported a several seizures and confiscations of protected sharks and rays, some of which were reported in the national or social media (Figure 10).

During the same period, WCS also made 657 phone calls to fishermen and landing site data collectors engaged in WCS citizen science networks. During the 20-48 monthly calls, WCS provided fishermen with weather updates and storm warnings to ensure their well-being as well as motivate them to follow fishery rules and protected species regulations. The technical

assistance and mentoring support provided during phone calls to citizen scientists was followed up by providing fresh supplies of batteries for their equipment, data sheets, species identification tools, and educational outreach materials.

During the SUFAL shark and ray assignment period, WCS provided 116 training sessions to individual or small groups of citizen scientist fishermen in Pathorghata, Pirojpur, and Khulna, and to landing site data collectors at their respective sites.



Figure 9. Mid-level government officials (left) including from the BFD (right) engaged in technical training workshops facilitated by WCS.



Figure 10. Trainings, traveling exhibitions, and outreach tools strengthened the competencies of BFD and other law enforcement officers to combat the illegal trade of protected sharks and rays. Photos © WCCU/BFD.

Printed communication tools and posters for identifying protected sharks and rays from their carcasses and body parts were disseminated among fisherfolk, fish traders, fishing vessel owners, and government officers to inform and motivate them to implement the amended Wildlife Act Schedule listings of threatened sharks and rays (Table 1).

Improving the traceability of shark and ray catches, landings, and trade through improved capacity and processes in the Department of Fisheries

The Department of Fisheries is a key partner for improving shark and ray conservation management. The DoF mandate includes reporting shark and ray catches and landings to the Indian Ocean Tuna Commission (IOTC), the regional fisheries management organization for the Bay of Bengal, and to FAO, as well as inspecting export shipments of fish products and issuing No Objection Certificates (NOCs) through the DoF's Fish Inspection and Quality Control unit (FIQC).

Information on shark/skate/ray catches and landings reported in the *Yearbook of Fisheries Statistics of Bangladesh* is reported separately for artisanal and industrial fisheries, but not according to species or species groups. The DoF Director (Marine) showed a strong interest to engage with the BFD for improving the traceability of shark and ray catches, landings, and trade, and improving compliance with national wildlife protection and international trade regulations. The SUFAL consultancy assignment provided an ideal opportunity to initiate this key collaboration between the DoF and the BFD.

WCS engaged with the DoF Marine Fisheries Office (MFO) and Dr. Sharif Uddin throughout the SUFAL consultancy assignment to gain a better understanding of current DoF practices for monitoring shark and ray catches, landings, and export shipments, identify opportunities for improving compliance with international reporting requirements, and strengthen institutional collaboration between the BFD and DoF (Figure 11).

The DoF Director (Marine) commended the BFD on the Wildlife Act amendment for improving the protection globally threatened sharks and rays known or suspected to occur in Bangladesh, acknowledging that this national law must be enforced by all agencies and departments. As an immediate first step, an official stamp was prepared with assistance from WCS, to be printed on all fishing vessel licenses issued by the DoF. The stamp states that "Sharks, skates, and rays protected by law must be released safely at sea. Retained sharks, skates, and rays must be reported at landing. Killing and trading protected animals or their body parts is a punishable offence."

Dr. Sharif highly appreciated the technical trainings provided to DoF mid- and field-level officers (see above) and he initiated additional trainings on the detection and identification of protected sharks and rays for DoF officers during regular meetings held in the 16 coastal

Upazillas and facilitated by WCS-trained DoF officers. To ensure maximum compliance with national laws and international obligations related to sharks and rays, Dr. Sharif Uddin encouraged trained DoF inspectors to inform processors and traders about species protected under the Bangladesh Wildlife Act and regulated under CITES. He emphasized the importance of raising awareness about protected marine wildlife among all fishery stakeholders using the mass communication tools developed under the SUFAL shark and ray consultancy assignment.

On request from the DoF, WCS provided information on marine capture fisheries related to marine mammal bycatch to achieve compliance with the United States Marine Mammal Protection Act (US MMPA) Import Provisions. WCS compiled a list of cetaceans available in Bangladesh's Economic Exclusive Zone (EEZ) along with available population estimates, fishing gear known to entangle them, mortality rates, and bycatch reduction and educational outreach efforts. In a first step to fulfilling US MMPA reporting requirements, the DoF issued an order requiring industrial trawl vessels to report on any dolphins, porpoises, and whales accidentally caught or injured during fishing operations.

The DoF Director (Marine) requested WCS to propose practical solutions for improving DoF monitoring and reporting processes of catches, landings, and exports. He enabled WCS to accompany the DoF inspectors on their inspections of industrial trawl vessels in Chattogram port and requested his officers at the MFO to explain the data management of marine fishery catch logs and vessel licensing. Insights gained during these visits, technical trainings, and NDF assessments helped us to identify gaps in procedures and practices.

Together with the BFD, WCS plans to engage with the DoF to help ensure transparency and traceability of shark and ray catches, landings, and trade. First steps are to (i) review the Marine Fisheries Rules currently being developed for ensuring that they align with the Wildlife Act, CITES, CMS, IOTC resolutions and recommendations in the NCS/NPOA-Sharks & Rays are incorporated; (ii) revise the industrial trawl fishery logbook format; (iii) incorporate information on protected sharks and rays and safe release procedures in the DoF-issued fishing vessel license booklet; and (iv) promote *Standard Operating Procedures (SOP) for Shark and Ray Data Collection at Fish Landing Sites in Bangladesh* developed by WCS under the SUFAL shark and ray assignment.

WCS will build on the findings from the SUFAL shark and ray consultancy assignment to support the DoF on improving reports on shark and ray catches, landings, and trade. Species-specific records will help the BFD meet reporting requirements from CITES and CMS and improve the overall traceability of the shark and ray fishery and trade in Bangladesh.



Figure 11. WCS engaged with the Marine Fisheries Wing of the DoF (top left) to provide technical support for improving reporting and monitoring of shark and ray catches (top right) by skippers and vessel owners (bottom left) of industrial trawl fishing vessels in Chattogram (bottom right).

9. Develop mass communication instruments for shark and ray conservation

For developing an informed public about the critical role of sharks and rays in maintaining a healthy ocean ecosystem, WCS developed an educational outreach exhibition titled *Ocean Guardians – Protecting Threatened Sharks and Rays in Bangladesh*. We also developed a wide variety of mass awareness tools including richly illustrated brochures, pocket field guides, and posters for identifying sharks and rays in Bangladesh, a coloring book on *Amazing Aquatic Animals of Bangladesh*, and info graphs on the key characteristics of sharks and rays and how they differ from bony fish, keys to different shark and ray groups, names and functions of shark and ray body parts and debunking myths on their medicinal value.

Traveling educational outreach exhibition

The *Ocean Guardians* exhibition improved knowledge among fishers, fish traders, processors, consumers, law enforcement officers, and the general public about the critical role of sharks and rays in maintaining a healthy ocean ecosystem, the threats these species face, laws and

rules governing their exploitation and trade, recognizing protected species, and safe release procedures. Key messages, content descriptions, facilitation instructions, and assessment results of the *Ocean Guardians – Protecting Threatened Sharks and Rays in Bangladesh* exhibition are presented in a separate report submitted by WCS to the SUFAL PMU along with the 3rd progress report to enable and encourage replication in the future.

The exhibition conducted in April/May 2022 reached 4,127 visitors at six major shark and ray landing sites, including Khulna, Bagerhat, Patharghata/Borguna, Alipur/Kuakata, Cox’s Bazar, and Chattogram. Visitors, including fishers, fish traders, government officials, law enforcement officers, students, and community members, were engaged by trained facilitators in games and informal discussions. Interactive games, infographics, 3D and 2D models, high-quality photographs, and discovery towers were included in the *Ocean Guardians* exhibition and incorporated in training and consultation events conducted under the SUFAL shark and ray assignment.

The effectiveness of the *Ocean Guardians* exhibition was assessed based on changes in answers from 100 visitors to nine questions asked before and after the exhibition. Results show that participants started out by answering 42% of questions on the conservation value, status, and ecological needs of sharks and rays correctly. After attending the exhibition, visitors demonstrated an increase of knowledge on sharks and rays by answering 87% of the questions correctly (Figure 12).

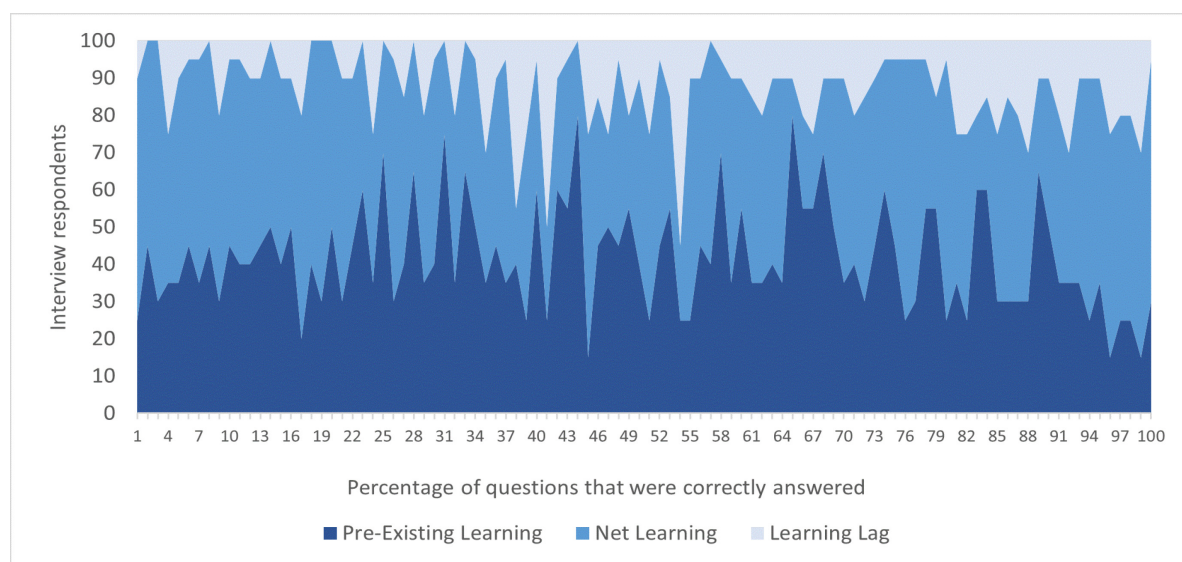


Figure 12. One hundred pre- and post-exhibition interviews indicate that the exhibition increased the knowledge of attendees about the role of sharks and rays in maintaining a healthy ocean, recognizing protected species, and safe release procedures.

Communication tools

WCS developed a variety of communication tools to raise public awareness about the critical role of sharks and rays in maintaining a healthy marine ecosystem and sustainable fisheries, and to empower fisherfolk, fish traders and law enforcement officers to recognize protected shark and ray species and safely release them.

A total of 1,500 posters and 4,000 brochures developed by WCS for the SUFAL shark and ray consultancy assignment and approved by the SUFAL PMU were printed and distributed among fishers, fish traders, and fishing boat owners encountered during land and sea-based investigations, given to participants of training and consultation programs and visitors to educational outreach exhibitions conducted by WCS under this assignment (Figure 13; see Table 1 for communication tools). These mass communication tools were highly appreciated and several fisheries, wildlife, and customs officers in coastal areas requested additional copies for dissemination and display in public areas and local government offices.

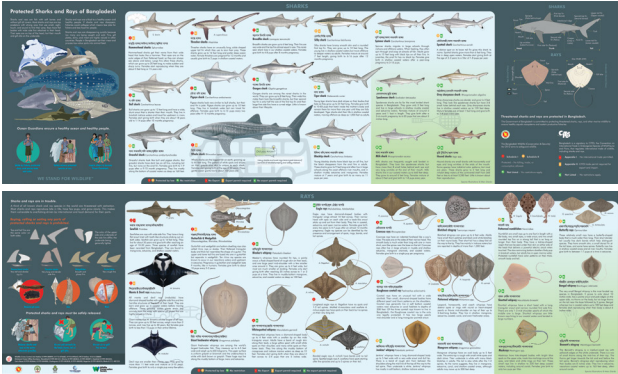
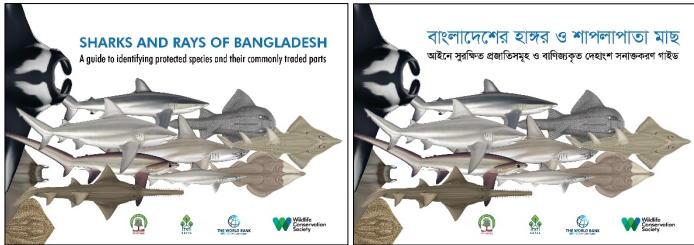
An identification guide for protected sharks and rays of Bangladesh and commonly traded body parts was developed by WCS. To ensure its effectiveness and use by law enforcement officers, a draft version was tested during training programs and changes were made according to comments from participants. The revised guidebook was further enriched with illustrations from renowned shark and ray artist Marc Dando and is awaiting final approval from the SUFAL PMU for production and dissemination in print and as downloadable PDF.

In collaboration with local animators and film editors, a 12-minute-long animated film in Bengali language highlighting efforts by the Government of Bangladesh to protect threatened sharks and rays through science-based, community informed conservation management was prepared by WCS under the SUFAL shark and ray consultancy assignment. The draft version of the film can be viewed [here](#). After approval from the SUFAL PMU, this short film will be finalized and made available for public sharing through social media channels and in training, consultation, and educational outreach events.



Figure 13. The guided exhibition was led by WCS staff and interns, which aimed to improve the capacity of BFD and DoF field-level officers, fish traders, shark and ray processors and consumers to identify protected shark and ray species using communication tools developed under the SUFAL shark and ray consultancy assignment.

Table 1. Communication tools for shark and ray conservation and for strengthening compliance with CITES developed by WCS under the SUFAL shark and ray consultancy assignment.

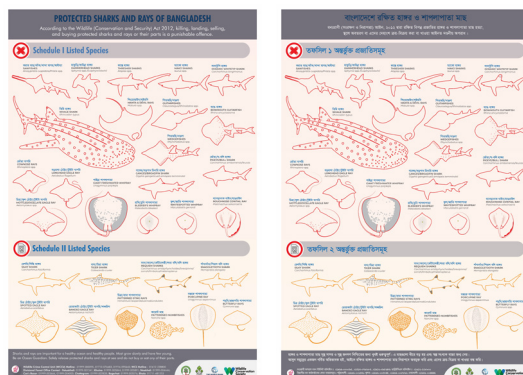
Cover Image	Title	Summary Content
	Protected Sharks and Rays of Bangladesh বাংলাদেশে আইন দ্বারা সুরক্ষিত হাঙ্গর ও শাপলাপাতা মাছ	The richly illustrated water-proof brochure with short descriptions of the physical characteristics, biology, ecology and habitat preferences of commonly landed and traded sharks and rays of Bangladesh enables fishers, traders, and government officers to recognize protected species and safely release them at sea. Produced in English and Bangla language.
	Sharks and Rays of Bangladesh – A guide to identifying protected species and their commonly traded parts বাংলাদেশের হাঙ্গর ও শাপলাপাতা মাছ – আইনে সুরক্ষিত প্রজাতিসমূহ ও বাণিজ্যিকৃত দেহাংশ সনাক্তকরণ গাইড	The richly illustrated pocket-size field guide empowers law enforcement officers, fishers, shark and ray traders, and citizen scientists to identify species protected under the Bangladesh Wildlife (Conservation & Security) Act, 2012, and regulated for international trade under CITES, from carcasses and commonly traded body parts. Prepared in English and Bangla language.



Sharks and Rays of Bangladesh Regulated for International Trade under CITES

আন্তর্জাতিক বাণিজ্যে সাইটিস নিয়ন্ত্রিত
বাংলাদেশের হাঙ্গর ও শাপলাপাতা জাতের
মাছ

The poster uses common tools to represent key characteristics of shark and ray species and species groups listed under CITES, including visual guidance on identifying their commonly traded parts, to enable law enforcement officers, traders, and fishers to strengthen compliance with international trade regulations. Produced in Bangla language.



Sharks and Rays protected under the Wildlife Act

বাংলাদেশে রক্ষিত হাঙ্গর ও শাপলাপাতা মাছ

The poster illustrates key characteristics of shark and ray species and species groups listed under Schedule I and II of Wildlife (Conservation & Security) Act, 2012, making it easier for law enforcement officers, traders, fishers, and consumers to recognize them. Produced in English and Bangla language.

10. Formulate recommendations to amend the Wildlife (Conservation and Security) Act, 2012 to protect sharks and rays

In September 2021, Bangladesh amended the list of sharks and rays protected under the Wildlife (Conservation and Security) Act, 2012, through gazette notification, thereby strictly protecting eight genera and 23 species of sharks and rays under Schedule I and restricting landing and trade of one genus and 29 species of sharks and rays under Schedule II. The amended listing was prepared by WCS on request from the BFD, reviewed by national and international experts, and endorsed in an inter-ministerial meeting in April 2021.

Twenty of the 52 shark species and 27 of the 62 ray species reported or suspected to occur in Bangladesh as per information available in 2021 were listed under Schedule I based on their classification as CR or EN in the Global IUCN Red List or in the IUCN Red List for sharks and rays in the Arabian Seas Region, and/or inclusion in CITES Appendix I, and/or CMS, and/or protected under a resolution of the IOTC. The criteria used for including 13 shark and 19 ray species in Schedule II were their classification as VU in the Global IUCN Red List or the IUCN Red List for sharks and rays in the Arabian Seas Region, and/or listing in CITES or CMS Appendix II. Some exceptions were made to the criteria described above due to taxonomic uncertainties and “look alike” species that cannot be easily distinguished by managers or law enforcement officers. In some cases, entire genus versus individual species were listed (e.g., *Sphyrna*, *Alopias*, *Isurus*, *Pristis*, *Mobula*, *Rhinobatos*, *Glaucostegus*, *Rhynchobatus*, *Gymnura* spp.).

The amendment made Bangladesh the first country in the world to grant full legal protection to all guitarfishes and wedgefishes. Of the CITES listed shark and ray species, all are listed under Schedule I as strictly protected, except for the Silky shark *Carcharhinus falciformis*, with extremely low volume of landings, and the White shark *Carcharodon carcharias*, not recorded in Bangladesh, listed under Schedule II of the Bangladesh Wildlife Act.

During the first phase of the SUFAL shark and ray consultancy assignment, WCS assisted in preparations for the inter-ministerial meeting called by the MoEFCC on 4th April 2021 by providing a presentation and ensuring support from DoF delegates and reviewed the final documents for the official gazette notification. WCS also prepared a press release announcing the amended listing of protected sharks and rays in Bangladesh for national and international media with supporting visuals.²

² <https://newsroom.wcs.org/Bangladesh-Takes-Major-Step-to-Protect-Threatened-Sharks-and-Rays.aspx>, <https://www.thedailystar.net/views/opinion/news/ray-hope-people-and-marine-wildlife-2186166>, <https://www.forbes.com/2021/10/11/bangladesh-takes-major-step-to-protect-threatened-sharks-and-rays/>, <https://www.globalseafood.org/bangladesh-moves-to-protect-threatened-sharks-and-rays>

WCS provided additional recommendations to amend the Wildlife (Conservation and Security) Act, 2012, with suggested definitions of Schedule I and II, suggested penalties for exploitation, trade, possession, and consumption of listed species, and specifying rules for wildlife possession, transit, and registration permits. On request from the BFD, WCS also drafted proposed formulations for amending the Import Policy Order and the Coast Guard and Border Guard Acts, to align with the Bangladesh Wildlife Act and mandate other government agencies to support its enforcement, including for listed sharks and rays.

WCS is prepared to assist the BFD on request with formulating additional recommendations to amend the Wildlife (Conservation and Security) Act, 2012, for clarifying the definitions of Schedule I and II or suggesting penalties for exploitation, trade, possession, and consumption of Schedule I/II listed species.

11. Completion of assignment objectives, current updates, and submitted reports to the PMU/PMS

WCS has completed all contractually agreed activities and submitted all deliverables for the SUFAL *Shark and Ray Associated Species Conservation Strategy and Non-Detriment Findings* assignment. The list of contractual deliverables, completed activities, and reports is provided as Appendix 6, with an overview of all documents, including lesson plans for replicable training and educational outreach sessions, prepared by WCS under the consultancy assignment in Appendix 7. Hardcopies of all these documents were provided with the 3rd Progress Report to the SUFAL PD office. WCS will address comments received from the SUFAL PMU on this draft final report and the documents submitted in July 2022 for re-submission by 12 November 2022 as per contractual agreement.

WCS is sincerely grateful to the Bangladesh Forest Department and the SUFAL PMU for enabling a successful collaboration. We believe that significant positive changes have been achieved through this consultancy assignment for enabling improved shark and ray conservation management in Bangladesh. WCS is committed to providing technical support to the Forest Department for implementing strategic conservation actions for sharks and rays in Bangladesh and strengthening CITES compliance through research, capacity building, educational outreach activities, and facilitating interagency collaborations.

Appendix 1. List of shark species confirmed¹ or suspected² to occur in Bangladesh with their status in the Bangladesh Wildlife (Conservation and Security) Act 2012,³ IUCN Global Red List,⁴ CITES,⁵ CMS,⁶ and IOTC.*

Scientific Name	Common/English Name	Bengali/ Local Name	IUCN Red List Status	CITES Appendix	CMS Appendix	Schedule in Wildlife Act
Confirmed						
<i>Alopias superciliosus</i> *	Bigeye thresher	বড়চোখা কাস্তে হাঙ্গর	VU	II	II	I
<i>Alopias pelagicus</i> *	Pelagic thresher	নীল কাস্তে হাঙ্গর	EN	II	II	I
<i>Carcharhinus amboinensis</i>	Pigeye shark	ভোঁতা বলি হাঙ্গর	VU	NL	NL	I
<i>Carcharhinus leucas</i>	Bull shark	ঘ-বলি হাঙ্গর	VU	NL	NL	I
<i>Carcharhinus amblyrhynchoides</i>	Graceful shark	সাদা লতাবলি হাঙ্গর	VU	NL	NL	II
<i>Carcharhinus brevipinna</i>	Spinner shark	কালো লতাবলি হাঙ্গর	VU	NL	NL	II
<i>Carcharhinus falciformis</i> *	Silky shark	রেশমি হাঙ্গর	VU	II	II	II
<i>Glyphis gangeticus</i>	Ganges shark	গাঙ্গেয় চিনারি হাঙ্গর	CR	NL	NL	I
<i>Carcharhinus limbatus</i>	Blacktip shark	লতাবলি হাঙ্গর	VU	NL	NL	II
<i>Carcharhinus macroti</i>	Hardnose shark	শক্তমাথা লতাবলি হাঙ্গর	NT	NL	NL	NL
<i>Carcharhinus melanopterus</i>	Blacktip reef shark	কালোডগা লতাবলি হাঙ্গর	VU	NL	NL	II
<i>Carcharhinus sorrah</i>	Spottail shark	কালোলোজী লতাবলি হাঙ্গর	NT	NL	NL	II
<i>Lamiopsis temminckii</i>	Broadfin shark	বড়পাখ চিনারি হাঙ্গর	EN	NL	NL	I
<i>Galeocerdo cuvier</i> *	Tiger shark	বাঘা হাঙ্গর	NT	NL	NL	II
<i>Rhizoprionodon acutus</i>	Milk shark	সাদা লতাবলি হাঙ্গর	VU	NL	NL	NL
<i>Rhizoprionodon oligolinx</i>	Grey sharpnose shark	আটাইল্যা/সোনালী লতাবলি হাঙ্গর	NT	NL	NL	NL
<i>Negaprion acutidens</i>	Sharptooth lemon shark	দাগহীন বলি হাঙ্গর	EN	NL	NL	I
<i>Scoliodon laticaudus</i>	Spadenose shark	ছুরি/কোদালনাক হাঙ্গর	NT	NL	NL	NL
<i>Hemipristis elongata</i>	Snaggleteooth shark	শিয়াল-বলি হাঙ্গর	VU	NL	NL	II
<i>Chiloscyllium burmensis</i>	Burmese bambooshark	খাঁজওয়ালা গুলে হাঙ্গর	VU	NL	NL	NL

<i>Chiloscyllium griseum</i>	Grey bambooshark	ধূসর গুলে হাঙ্গর	VU	NL	NL	NL
<i>Chiloscyllium hasseltii</i>	Indonesian bambooshark (Hasselt's bambooshark)	ইন্দোনেশিয়ান গুলে হাঙ্গর	EN	NL	NL	NL
<i>Rhincodon typus</i> *	Whale shark	তিমি হাঙ্গর	EN	II	I	I
<i>Atelomycteris marmoratus</i>	Coral catshark	কোরাল হাঙ্গর	NT	NL	NL	NL
<i>Eusphyra blochii</i> *	Winghead shark (Slender hammerhead)	লম্বামাথা হাতুড়ি হাঙ্গর	EN	NL	NL	I
<i>Sphyrna lewini</i> *	Scalloped hammerhead	খাঁজকাটা হাতুড়ি হাঙ্গর	CR	II	II	I
<i>Sphyrna mokarran</i> *	Great hammerhead	বড়পাখ হাতুড়ি হাঙ্গর	CR	II	II	I
<i>Sphyrna zygaena</i> *	Smooth hammerhead	খাঁজহীন হাতুড়ি হাঙ্গর	VU	II	II	I
<i>Stegostoma fasciatum</i>	Zebra shark	জেব্রা/ চিত্রা হাঙ্গর	EN	NL	NL	I
<i>Triaenodon obesus</i>	Whitetip reef shark	সাদাপাখ বলি হাঙ্গর	VU	NL	NL	II
<i>Iago omanensis</i>	Bigeye hound shark	গুলে হাঙ্গর/ ছুরি টুইটেগ	LC	NL	NL	NL
Suspected						
<i>Alopias vulpinus</i> *	Common thresher	সাদাপাখ কাস্তে হাঙ্গর	VU	II	II	I
<i>Carcharhinus longimanus</i> *	Oceanic whitetip shark	সাদাডগা হাঙ্গর	CR	II	I	I
<i>Carcharhinus sealei</i>	Blackspot shark	কালাফোঁটা হাঙ্গর	VU	NL	NL	NL
<i>Carcharhinus dussumieri</i>	Whitecheek shark	সাদাথুতনি হাঙ্গর	EN	NL	NL	I
<i>Carcharhinus hemiodon</i>	Pondicherry shark	বড়চোখা বলি হাঙ্গর	CR	NL	NL	I
<i>Euprotomicrus bispinatus</i>	Pygmy shark	বামন হাঙ্গর	LC	NL	NL	NL
<i>Chaenogaleus macrostoma</i>	Hooktooth shark	বঁড়শিদাতী হাঙ্গর	VU	NL	NL	II
<i>Chiloscyllium arabicum</i>	Arabian carpetshark	গুইলা হাঙ্গর	NT	NL	NL	NL
<i>Chiloscyllium indicum</i>	Slender bambooshark	সরু গুইলা	VU	NL	NL	NL
<i>Chiloscyllium plagiosum</i>	Whitespotted bambooshark	সাদাফোঁটা গুইলা	NT	NL	NL	NL
<i>Chiloscyllium punctatum</i>	Grey carpet shark (Brownbanded bambooshark)	কালাপাখ গুইলা হাঙ্গর	NT	NL	NL	NL
<i>Loxodon macrorhinus</i>	Sliteye shark	অঞ্জলিচোখা হাঙ্গর	NT	NL	NL	NL

<i>Prionace glauca</i> *	Blue shark	নীল হাঙ্গর	NT	NL	II	II
<i>Centrosyllium ornatum</i>	Ornate dogfish	কমলা হাঙ্গর	LC	NL	NL	NL
<i>Nebrius ferrugineus</i>	Tawny nurse shark	একশাখালেজী তামাটে হাঙ্গর	VU	NL	NL	II
<i>Isurus oxyrinchus</i> *	Shortfin mako shark	ছোটপাখ ম্যাকো হাঙ্গর	EN	II	II	I
<i>Isurus paucus</i> *	Longfin mako shark	বড়পাখ ম্যাকো হাঙ্গর	EN	II	II	I
<i>Eridacnis radcliffei</i>	Pygmy ribbontail catshark	ফিতালেজী বামন হাঙ্গর	LC	NL	NL	NL
<i>Pseudocarcharias kamoharai</i> *	Crocodile shark	কুমির গুইলা	LC	NL	NL	NL
<i>Carcharodon carcharias</i> *	White shark	সাদা হাঙ্গর	VU	II	I	II
<i>Megachasma pelagios</i>	Megamouth shark	মেগামাউথ হাঙ্গর	LC	NL	NL	NL
<i>Carcharias taurus</i>	Sand tiger shark	ধূসর বাঘা হাঙ্গর	CR	NL	NL	I
<i>Glyphis glyphis</i>	Speartooth shark	চিনারি হাঙ্গর	VU	NL	NL	NL
<i>Mustelus mosis</i>	Arabian smoothhound	গুলে হাঙ্গর	NT	NL	NL	NL
<i>Scoliodon macrorhynchus</i>	New/Pacific spadenose shark	কালা হাঙ্গর	NT	NL	NL	NL

¹ Species are considered as 'confirmed' to occur in Bangladesh if there is photographic or genetic evidence provided in published references or by WCS and/or the IUCN Global Red List and Fishbase assessment includes Bangladesh as Country of Occurrence in the species' geographic range, as per July 2022.

² Species are considered 'suspected' to occur in Bangladesh if they are listed as suspected in published references and/or the IUCN Global Red List assessment includes the Indian Ocean in the species' geographic range, as per July 2022.

³ As per September 2021 Amendment.

⁴ As per <http://www.iucnredlist.org> accessed in July 2022.

⁵ CITES Appendix I means that international trade is prohibited. CITES Appendix II means that a positive NDF and export permit is required for international trade.

⁶ CMS Appendix I listed species are strictly protected. Appendix II species require international agreements for their conservation and management.

* IOTC mandates conservation management.

Appendix 2. List of ray species confirmed¹ or suspected² to occur in Bangladesh with their status in the Bangladesh Wildlife (Conservation and Security) Act 2012,³ IUCN Global Red List,⁴ CITES,⁵ CMS,⁶ and IOTC.*

Scientific Name	Common/English Name	Bengali/ Local Name	IUCN Red List Status	CITES Appendix	CMS Appendix	Schedule in Wildlife Act
Confirmed						
<i>Aetomylaeus nichofii</i>	Banded eagle ray	ডোরাকাটা ঠুইট্যা	VU	NL	NL	II
<i>Rhinobatos annandalei</i>	Bengal guitarfish (Annandale's guitarfish)	সাদাফোঁটা বাংলা পিতাম্বর	CR	NL	NL	I
<i>Aetobatus ocellatus</i>	Spotted eagle ray	কাঁটায়ুক্ত ফুল ঠুইট্যা	VU	NL	NL	II
<i>Aetomylaeus maculatus</i>	Mottled eagle ray	কাঁটাহীন কমফোঁটা ঠুইট্যা	EN	NL	NL	I
<i>Aetomylaeus milvus</i>	Ocellate eagle ray	কাঁটাহীন বেশিফোঁটা ঠুইট্যা	EN	NL	NL	I
<i>Anoxypristis cuspidata</i>	Narrow/Pointed sawfish	চিকন করাত মাছ	EN	I	I	I
<i>Brevitrygon imbricata</i>	Bengal whipray	খাঁজহীন চোখামুখ ফাইসি	VU	NL	NL	NL
<i>Hemitrygon bennetti</i>	Bennett's stingray	ঘুড়ি শাপলাপাতা	VU	NL	NL	NL
<i>Glaucostegus granulatus</i>	Sharpnose guitarfish	সরুনাক পিতাম্বর	CR	II	NL	I
<i>Glaucostegus younholeei</i>	Bangladeshi Guitarfish	বাংলাদেশি পিতাম্বর	NE	NL	NL	I
<i>Brevitrygon walga</i>	Scaly whipray	খাঁজযুক্ত চোখামুখ ফাইসি	NT	NL	NL	NL
<i>Brevitrygon heterura</i>	Dwarf whipray	পাইসি	VU	NL	NL	NL
<i>Pateobatis bleekeri</i>	Bleeker's whipray	রাম্মি/চুনি শাপলাপাতা	EN	NL	NL	I
<i>Taeniurops meyeri</i>	Blotched fantail ray (Blotched stingray)	কালোদাগী শাপলাপাতা	VU	NL	NL	II
<i>Taeniura lymma</i>	Bluespotted lagoon ray (Bluespotted fantail ray)	চ্যাপ্টালেজী নীলফোঁটা শাপলাপাতা	LC	NL	NL	NL
<i>Neotrygon caeruleopunctata</i>	Bluespotted maskray	নপুরা/নীলফোঁটা শাপলাপাতা	LC	NL	NL	NL
<i>Glaucostegus obtusus</i>	Widenose guitarfish	চ্যাপ্টানাক পিতাম্বর	CR	II	NL	I
<i>Narcine timlei</i>	Brown numbfish	দাগহীন বাদামি কারেন্ট মাছ	VU	NL	NL	II
<i>Glaucostegus typus</i>	Giant guitarfish	বড় পিতাম্বর	CR	II	NL	I

<i>Himantura uarnak</i>	Coach whipray (Reticulated whipray)	চ্যাপ্টানাক বাঘা শাপলাপাতা	EN	NL	NL	II
<i>Glaucostegus thouin</i>	Clubnose guitarfish	গোদানাক পিতাম্বরি	CR	II	NL	I
<i>Himantura undulata</i>	Honeycomb whipray (Bleeker's variegated whipray)	বড়দাগী বাঘা শাপলাপাতা	EN	NL	NL	II
<i>Pastinachus sephen</i>	Cowtail ray	চ্যাপ্টানাক হাঙরাইল	NT	NL	NL	NL
<i>Pastinachus gracilicaudus</i>	Narrow cowtail ray	সরু হাঙরাইল	EN	NL	NL	NL
<i>Himantura fluviatilis</i>	Ganges stingray	গাঙ্গেয় শাপলাপাতা	NT	NL	NL	NL
<i>Urogymnus polylepis</i>	Giant freshwater whipray	পাইল্লা/ বাইল্যা শাপলাপাতা	EN	NL	NL	I
<i>Mobula birostris</i> *	Giant manta ray	লুইমনি/সাদাপিঠ শিংচোয়াইন	EN	II	I	I
<i>Mobula mobular</i> *	Spinetail devilray (Giant devilray)	সাদাপেট শিংচোয়াইন	EN	II	I	I
<i>Mobula kuhlii</i> *	Shortfin devilray (Kuhl's devilray)	ছোটপাখ শিংচোয়াইন	EN	II	I	I
<i>Mobula tarapacana</i> *	Sicklefin devilray	দেউমাছ/ধূসরপেট শিংচোয়াইন	EN	II	I	I
<i>Mobula thurstoni</i> *	Bentfin devilray	বাঁকাপাখ শিংচোয়াইন/দেউমাছ	EN	II	I	I
<i>Pristis zijsron</i>	Green sawfish	সবুজ করাত মাছ	CR	I	I	I
<i>Pristis pristis</i>	Largetooth sawfish	বড়দাঁত করাত মাছ	CR	I	I	I
<i>Pateobatis jenkinsii</i>	Jenkin's whipray	কালোদাগী ঘুড়ি শাপলাপাতা	VU	NL	NL	II
<i>Rhinoptera javanica</i>	Javanese cownose ray (Javan cownose ray)	লম্বালেজী ঘাপরি	EN	NL	NL	I
<i>Rhinoptera jayakari</i>	Oman cownose ray (Shorttail cownose ray)	ছোটলেজী ভোঁতা ঘাপরি/খাটোলেজী ঘাপরি	EN	NL	NL	I
<i>Himantura leoparda</i>	Leopard whipray	ছোটদাগী বাঘা শাপলাপাতা	VU	NL	NL	II
<i>Urogymnus granulatus</i>	Mangrove whipray	সাদাদাগী বাদা শাপলাপাতা	VU	NL	NL	II
<i>Urogymnus asperrimus</i>	Porcupine ray	সজারু শাপলাপাতা	VU	NL	NL	II
<i>Gymnura zonura</i>	Zonetail butterfly ray	সাদাফোঁটা পদুনি	EN	NL	NL	II
<i>Gymnura poecilura</i>	Longtail butterfly ray	লম্বালেজী পদুনি	VU	NL	NL	II

<i>Aetobatus flagellum</i>	Longhead eagle ray	লম্বামাথা ফোঁটাহীন ঠুইট্যা	EN	NL	NL	I
<i>Pteroplatytrygon violacea</i>	Pelagic stingray	বেগুনী/কালো শাপলাপাতা	LC	NL	NL	NL
<i>Rhinobatos ranongensis</i>	Ranong guitarfish	নাঙলা/পিতাম্বর	VU	NL	NL	I
<i>Maculabatis pastinacoides</i>	Round whiplay	গোল শাপলাপাতা	EN	NL	NL	II
<i>Pastinachus solocirostris</i>	Roughnose cowtail ray	থ্যাবড়ানাক থাইন/হাঙরাইল/সরুনাক হাঙরাইল	EN	NL	NL	I
<i>Narcine breviliabata</i>	Shortlip numbfish	ভোঁতা মুখ কারেন্ট মাছ	VU	NL	NL	II
<i>Telatrygon zugei</i>	Pale-edge sharpnose ray (Sharpnose stingray)	সরুনাক শাপলাপাতা	VU	NL	NL	NL
<i>Rhina ancylostoma</i>	Bowmouth guitarfish (Shark ray)	ব্যাঙ হাঙর/গোলনাক পিতাম্বর	CR	II	NL	I
<i>Maculabatis bineeshi</i>	Shorttail whiplay	বামন লেজি শাপলাপাতা	CR	NL	NL	NL
<i>Megatrygon microps</i>	Smalleye stingray	ক্ষুদেচোখা/সাদাফোঁটা শাপলাপাতা	DD	NL	NL	II
<i>Narcine maculata</i>	Smallspot numbfish	ছোটফোঁটা বাদামি কারেন্ট মাছ	VU	NL	NL	NL
<i>Narke dipterygia</i>	Spot-tail sleeper ray	চিত্রালেজী/সাদাফোঁটা কারেন্ট মাছ	DD	NL	NL	NL
<i>Rhinobatos lionotus</i>	Smoothback guitarfish	তেলাপিঠ পিতাম্বর/নাঙলা	CR	NL	NL	I
<i>Urogymnus lobistomus</i>	Tubemouth whiplay	চোঙামুখ শাপলাপাতা	EN	NL	NL	II
<i>Pateobatis uarnacoides</i>	Whitenose whiplay	সাদানাক শাপলাপাতা/হাউশ	EN	NL	NL	II
<i>Narcine prodorsalis</i>	Tonkin numbfish	টক্কিন কারেন্ট মাছ/কালোফোঁটালেজী	EN	NL	NL	NL
<i>Maculabatis gerrardi</i>	Whitespotted whiplay	ফুল শাপলাপাতা/জাতি শাপলাপাতা	EN	NL	NL	I
<i>Neotrygon indica</i>	Indian Ocean bluespotted maskray	ফুল শাপলাপাতা /নপরা /নাকপুরা	NL	NL	NL	NL
<i>Narcine lingula</i>	Chinese numbfish	চীনা/বড়ফোঁটা বাদামী কারেন্ট মাছ	VU	NL	NL	II
Suspected						
<i>Himantura tutul</i>	Fine-spotted leopard whiplay	বাঘা শাপলাপাতা	NL	NL	NL	NL
<i>Rhynchobatus australiae</i>	Bottlenose wedgefish	বোতলনাক নাঙলা/পিতাম্বর	CR	II	II	I
<i>Rhynchobatus laevis</i>	Smoothnose wedgefish	মসৃণনাক নাঙলা/পিতাম্বর	CR	II	NL	I

<i>Neotrygon kuhlii</i>	Kuhl's maskray	ফুল শাপলাপাতা	DD	NL	NL	NL
<i>Gymnura tentaculata</i>	Tentacled butterfly ray	বাদুড়/ লেজে ফোঁটাইনি পদুনি/পদ্মামনি	CR	NL	NL	II
<i>Maculabatis arabica</i>	Pakistan/ Arabic whiplay	জাতি শাপলাপাতা	CR	NL	NL	NL
<i>Mobula alfredi</i>	Reef manta ray	লুইমনি	VU	NL	NL	I
<i>Pastinachus ater</i>	Broad cowtail ray	হাঙরাইল	VU	NL	NL	NL
<i>Pateobatis fai</i>	Pink whiplay	গোলাপি শাপলাপাতা	VU	NL	NL	NL
<i>Maculabatis macrura</i>	Sharpenose whiplay	শাপলাপাতা	EN	NL	NL	NL
<i>Mobula eregoodoo</i> *	Longhorned pygmy devilray	শিংচোয়াইন/দেউমাছ/লম্বাশিংওয়ালা শিংচোয়াইন	EN	II	I	I

¹ Species are considered as 'confirmed' to occur in Bangladesh if there is photographic or genetic evidence provided in published references or by WCS and/or the IUCN Global Red List and Fishbase assessment includes Bangladesh as Country of Occurrence in the species' geographic range, as per July 2022.

² Species are considered 'suspected' to occur in Bangladesh if they are listed as suspected in published references and/or the IUCN Global Red List assessment includes the Indian Ocean in the species' geographic range, as per July 2022.

³ As per September 2021 Amendment.

⁴ As per <http://www.iucnredlist.org> accessed in July 2022.

⁵ CITES Appendix I means that international trade is prohibited. CITES Appendix II means that a positive NDF and export permit is required for international trade.

⁶ CMS Appendix I listed species are strictly protected. Appendix II species require international agreements for their conservation and management.

* IOTC mandates conservation management.

Appendix 3. Matrix summarizing priority actions for achieving NSC/NPOA-Sharks & Rays (2023-2033) objectives with resource requirements, possible sources of funding, projected outcomes, and performance indicators.

BFD=Bangladesh Forest Department, BFDC=Bangladesh Fisheries Development Corporation, CITES=Convention on International Trade in Endangered Species of Wild Fauna and Flora, CMS= Convention on the Conservation of Migratory Species of Wild Animals, DoF=Department of Fisheries, FIQC=Fish Inspection and Quality Control, GoB=Government of Bangladesh, IOTC=Indian Ocean Tuna Commission, LE=Law Enforcement (agencies), LG=Local Government (City Corporation, City Council, Union/Upazilla Parishad), MoC=Ministry of Commerce, MoD=Ministry of Defence, MoDMR=Ministry of Disaster Management and Relief, MoEFCC=Ministry of Environment, Forest, and Climate Change, MoF=Ministry of Finance, MoFL=Ministry of Fisheries and Livestock, MoHA=Ministry of Home Affairs, MoPA=Ministry of Public Administration, MoU=Memorandum of Understanding, MPA=Marine Protected Area, MSP=Marine Spatial Planning, NBR=National Board of Revenue, NCS=National Conservation Strategy, NDF=Non-Detriment Finding, NPOA=National Plan of Action, OECMs=Other effective area-based conservation measures, SMART=Spatial Monitoring and Patrolling Tool, SoNG=Swatch-of-No-Ground, SOP=Standard Operating Procedures, SSF=Small-scale Fishers/Associations, Uni=University, WCCU=Wildlife Crime Control Unit.

Objectives	Sub-objectives	Actions	Priority	Short term (1-3 years)	Mid term (4-7 years)	Long term (8-10 years)	Resources required (mio)	Possible source of funding	Lead Agencies/ Institution	Projected outcomes	Performance indicators
Reduce mortalities of threatened sharks and rays	Require live releases and prohibit retention.	Require live releases and prohibit retention of protected sharks and rays under Marine Fisheries Rules	High	✓			500	GoB budget allocations	DoF, MoFL	Fewer shark and ray mortalities leading to recovery of threatened species populations.	Catches and landings of protected species measurably reduced.
		Require documentation of mobulid ray discards from industrial fisheries under Marine Fisheries Rules as per IOTC	Med	✓				GoB budget allocations	DoF, MoFL		
		Prohibit shark and ray finning under Marine Fisheries Rules	Low	✓				GoB budget allocations	DoF, MoFL		
		Promote safe releases of protected and	High	✓	✓	✓		Donor funding	DoF, BFD		

		gravid sharks and rays							NGOs		
	Mandate gear modifications under Marine Fisheries Rules.	Enforce existing fishery laws and rules	High		✓			GoB budget allocations	DoF, Navy, Coast Guard, BFD		
		Prohibit use of all bottom set fishing gears in waters <10 meters/33 feet deep in Marine Fisheries Rules	High	✓				GoB budget allocations	DoF, MoFL		
		Require use of corrosive circle hooks and prohibit wire leaders on long-lines and gaffing and spearing in Marine Fisheries Rules	Med		✓			GoB budget allocations	DoF, MoFL		
		Evaluate effectiveness of gear modifications for reducing incidental catches and mortalities, and amend gear regulations accordingly	Med			✓		Research grants	DoF, BFD, BFRI, Uni, SSF, NGOs		
Protect priority shark and ray habitat	Incorporate priority shark and ray habitat in MSP, MPAs, and OECMs.	Incorporate time-area or gear-specific fishing closures into MSP, MPAs and OECMs.	Med		✓		20	Donor funding, GoB budget allocations	DoF, BFD, SSF, Uni, NGOs	Bycatch risk reduced in priority habitat leading to recovery of threatened species and sustainable fisheries.	Reduced infractions per patrolling day from baseline generated during first three years of NCS/NPOA.

											Catches, landings, trade of protected species measurably reduced
		Improve protection of shallow nearshore waters offshore the Sundarbans by expanding SoNG MPA	Med		✓			GoB budget allocations	MoEFCC, BFD, DoF		
Strengthen legal protection and enforcement	Amend laws and rules to be consistent with CITES, CMS, and IOTC	Fully operationalize Wildlife (Conservation and Security) Act 2012	High	✓				GoB budget allocations	BFD, MoEFCC,	Threatened sharks and rays protected by law. Non-threatened species regulated under fisheries rules. Enforcement institutionalized.	Gazette notifications of amended laws and rules. Exports reported by species and product. Number of NDFs developed.
		Amend Customs Act 1969, Imports and Exports (Control) Act 1950, Coast Guard Act 2016, Border Guards Bangladesh Act 2012, and Armed Police Battalions Ordinance 1979	Med		✓		1,000	GoB budget allocations	BFD, MoC, MoD, MoHA		
		Empower Customs through amended Export Rules, and the DoF FIQC unit	High	✓				GoB budget allocations	NBR, DoF, MoFL		

		through amended Fish Inspection and Quality Control Rules									
		Harmonize Marine Fisheries Act 2020, Marine Fisheries Rules, Protection and Conservation of Fish Rules (1985) with Wildlife (Conservation and Security) Act 2012	Med		✓			GoB budget allocations	MoFL, DoF, BFD		
		Review and update list of shark and ray species protected under Wildlife (Conservation and Security) Act 2012 every ten years	Low			✓		Donor funding	BFD, DoF, BFRI, MoEFCC		
		Conduct NDF assessments to ensure that permitted international trade does not negatively impact species or populations.	Med		✓	✓		GoB budget allocations	BFD, DoF, BFRI, Uni, NGOs		
		Review every five years and update NCS/NPOA-Sharks & Rays every ten years.	Low		✓	✓		GoB budget allocations, Donor funding	MoFL, DoF, MoEFCC, BFD		
		Share available resources and technical expertise among GoB agencies	Med		✓	✓		GoB budget allocations	LE		
	Conduct joint LE operations to	Improve enforcement and monitoring of fishery rules in MPAs	Med	✓	✓	✓	2,000	GoB budget allocations, Marine	DoF, Navy, Coast Guard, BFD	Export shipments and processing	Number of seizures and convictions

	stop illegal possession, trade, and consumption of protected sharks and rays and their products.	and other priority habitat for sharks and rays						Conservation Trust Fund		centers inspected, infractions reported and prosecuted.	initially increase followed by a decline as the number of protected sharks and rays traded is reduced.
		Strengthen border controls to stop illegal shark and ray trade with Myanmar	High	✓				GoB budget allocations	BGB, Police, Navy		
		Collaborate with international bodies and governments of shark and ray importing countries to investigate and combat illegal trade	Med	✓	✓	✓		GoB budget allocations, Donor funding, Research grant	NBR, MoEFCC, BFD, MoFL, DoF, NGOs		
		Sensitize local administrative officers and the judiciary to ensure that illegal wildlife trade is prosecuted	Med	✓	✓			Donor funding	BFD, DoF, NGOs		
		Create web-based national wildlife crime database	High	✓				Technical innovation/ support grant	BFD		
	Empower LE officers with training, mentoring, and resource materials to combat illegal trade	Develop incentive system for exceptional shark and ray LE achievements	Low			✓	100	GoB budget allocations, Marine Conservation Trust Fund	LE, MoD, MoHA	Institutional capacity sustained for detecting, identifying, prosecuting protected species in export	Number of detections of protected species initially increase followed by a decline as the number of

										shipments and processing centers.	protected sharks and rays traded is reduced.
		Provide interagency training and mentoring for field staff from LE agencies	High	✓				GoB budget allocations, NGOs	BFD, DoF, NGOs		
		Adopt identification guides for CITES listed species/parts and implement training in curricula for LE officers.	Med			✓		Donor funding	LE, Uni, NGOs		
		Enhance capacity of WCCU to train and mentor LE staff.	Med		✓			GoB budget allocations, Trust Fund	MoEFCC, NGOs		
		Use genetic tools to improve identification of products that cannot be visually identified	Med		✓			Research grants, GoB budget allocations	LE, BFRI, Uni, NGOs		
		Communicate with experts for identifying sharks and rays or their body parts from photographs.	Med	✓				NGOs	LE, Uni, SSF, NGOs		
Engage fishing communities and consumers in shark and ray protection	Enable fishers and traders to identify protected species	Disseminate tools to identify protected shark and ray species/genera.	High	✓	✓	✓	750	NGOs	DoF, BFD, LE, SSF, NGOs	Protected species not retained, landed, traded, or consumed.	Landings and detection of illegal trade in protected species declines.

	Reduce domestic demand for protected species through targeted awareness raising.	Publicize revised laws and rules through audience-tailored communication tools	High	✓				NGOs	BFD, DoF, SSF, NGOs	Protected species not traded or consumed.	Documented increase in awareness, reduced infractions, and increased local engagement.
		Develop and implement targeted communication strategy to reduce/stop consumption and trade of protected sharks and rays	Med	✓	✓			Research grants, NGOs, Donor funding	BFD, DoF, SSF, Uni, NGOs		
		Use examples from successful prosecutions to deter fishers, traders, and consumers from illegal landing, trade, and consumption of protected sharks and rays	Low		✓			GoB budget allocations	LE, SSF, BFD, DoF, NGOs		
	Empower community-based monitoring of protected species and their habitats.	Engage fishers as citizen scientists to record and report protected sharks and rays caught or bycaught in their gears	Med		✓			Technical innovation/ support grants, Donor funding, NGOs	BFD, DoF, SSF, NGOs	Protected species not retained or landed.	Landings of threatened species reduced and verified reports of catches increased.
		Empower community-led SMART patrols to monitor compliance	Med		✓			Marine Conservation Trust Fund, NGOs	BFD, DoF, SSF, NGOs		

		with protected species and fishery regulations and support prosecutions of illegal fishing.										
		Train and mentor local fishery stakeholders to monitor shark and ray landings and trade	High	✓				GoB budget allocations, research grants, NGOs	DoF, BFDC,BFD, SSF, Uni, NGOs			
		Encourage marine fishery stakeholder associations to promote compliance with protected species and fishery regulations	Low	✓	✓			GoB budget allocations, NGOs	DoF, BFD, SSF, Uni, NGOs			
		Communicate laws and rules on protected species, and spatial, temporal, and gear restrictions	Med	✓	✓			Marine Conservation Trust Fund, NGOs	BFD, DoF, SSF, Uni, NGOs			
		Publicly acknowledge fishers who safely release protected sharks and rays	Med		✓			GoB budget allocations	DoF, BFD, SSF, NGOs			
	Identify and promote value-enhanced products from sustainably caught non-threatened sharks and rays	Collaborate with traders and processors to identify opportunities for improving quality and profits derived from sustainably caught non-threatened sharks	Med			✓		Technical innovation/ support grant, Donor funding, NGOs	BFRI, Uni, NGOs	Protected species not retained, landed, traded, or processed.	Proportion of threatened species in trade reduced. Populations of threatened species recovering and non-threatened species stable.	

Improve monitoring and reporting of shark and ray catches, landings, and trade	Improve systematic monitoring of catches and landings and ensure that international reporting requirements are fully met	Harmonize shark and ray data collection protocols and procedures for national and international reporting through SOPs for improved systematic recording and reporting, including species-specific monitoring, expanding monitored sites, and strengthening capacity and accountability	High	✓					GoB budget allocations, Hilsa Trust Fund, NGOs	DoF, BFDC, BFRI, BFD, NGOs	Statistics available for detecting trends in species-specific catches, landing, and trade.	Proportion of protected species reported in fisheries statistics reduced. Species populations stable.
		Include list of protected species/genera and safe release instructions in DoF fishing permit booklet	Med	✓				1,200	GoB budget allocations	DoF		
		Mandate the recording and reporting of priority shark and ray species by BFDC and industrial fishing operations	High	✓					GoB budget allocations, NGOs	DoF, BFDC, MoFL		
		Provide technical training, mentoring, and oversight to shark and ray data collectors, inspectors, and industrial fishing vessel captains/skippers	High	✓					Donor funding, Marine Conservation/ Hilsa Trust Fund, NGOs	DoF, BFD, Uni, NGOs		

		Increase inspection and LE at fish landing sites	High	✓	✓	✓		GoB budget allocations	DoF, LE, BFD, MoPA, MoF		
	Improve systematic monitoring of shark and ray trade and ensure that international reporting requirements are fully met	Establish traceability and improve reporting of shark and ray exports/imports by including species/genus/product specific information on export declarations and in GoB export/import statistics	High		✓			GoB budget allocations	NBR, DoF, BFD, MoFL, MoEFCC NGOs	Shark/ray exports procedures compliant with CITES. Species/genus specific exports and levied revenue published in GoB statistics.	GoB export reports align with records from importing countries.
		Report revenue payments levied on species/genus specific shark and ray products in GoB statistics	Low			✓		GoB budget allocations	NBR, DoF, MoFL		
		Identify opportunities for designating ports of exit/entry for sharks and rays	Med			✓		GoB budget allocations	NBR, DoF, BFD, MoFL		
		Enforce existing licensing, business, and trade laws and rules	High		✓			GoB budget allocations	LG, MoC		
		Provide trade licenses to fish traders and exporters only after viewing short film and gazette notification on shark and ray regulations.	Med		✓			GoB budget allocations	LG, NBR		

		Incentivize compliance of processors and traders with national and international trade regulations.	Low			✓		Research grant, Donor funding	LG, BFD, DoF		
		Make CITES/NOC permits issued by BFD and export permits issued by DoF for shark and ray products available online.	Med		✓			GoB budget allocations, CITES/Donor funding	BFD, DoF		
		Inform shipping and courier services about export/import regulations under national wildlife laws and CITES.	High	✓				Donor funding, NGOs	BFD, DoF, LG, NGOs		
		Increase DoF and Customs monitoring and inspection of exported goods, confiscate shipments with products from protected species, and prosecute traders without permits.	High	✓				GoB budget allocations, NGOs	DoF, NBR, BFD		
		Require fish/fish product exporters/importers to register with DoF and declare shark/ray product exports/imports.	Med		✓			GoB budget allocations	DoF, LG, NBR		
		Ensure compliance with national wildlife laws and CITES	High	✓				GoB budget allocations,	DoF, BFD, MoFL		

		regulations by including species-specific documentation in DoF export/import process.						CITES/Donor funding			
		Prepare and implement methodology for DoF FIQC officers to sample export shipments for shark and ray products.	High	✓				Donor funding, NGOs	DoF, BFD		
		Ensure that all cases of illegal possession, trade, or consumption of protected sharks and rays are reported in web-based national wildlife crime database.	Med		✓			GoB budget allocations	BFD, LE		
	Evaluate monitoring results to ensure that protection efforts are effective.	Evaluate effectiveness of changes in shark and ray fishery and trade management by repeating NDF assessments on a regular basis (e.g., at the end of their validity or every 5 – 10 years)	Med			✓		GoB budget allocations, CITES/Donor funding,	DoF, BFD, Uni, NGOs	Robust information available and applied in adaptive conservation management of sharks and rays	Monitoring reports published annually. Policies updated.
		Strengthen capacity of the DoF to analyze and report shark and ray catches, landings, and trade	High		✓			GoB budget allocations, Hilsa Trust Fund, NGOs	MoFL, DoF, NGOs		

		Enable BFD and DoF to analyze and report on interagency and community-led SMART patrols	Med		✓			Marine Conservation Trust Fund, Donor funding, NGOs	MoEFCC, BFD, MoFL, DoF, NGOs		
		Use results from improved monitoring to update wildlife protection, fisheries, and trade rules	Med			✓		GoB budget allocations, NGOs	DoF, MoFL, BFD, MoEFCC		
Strengthen governance and coordination		Improve legal recognition of compliant fishers by helping them obtain formal documentation.	High		✓		1,000	Hilsa Trust Fund, NGOs	DoF, SSF, NGOs	GoB agencies empowered and supported by fishery stakeholders to protect threatened species and manage sustainable catch and trade of non-threatened species.	Stock assessments indicate threatened species show signs of population recovery and populations of non-threatened species stable.
		Identify and promote alternative employment for shark/ray fishers, processors, traders	Med			✓		NGOs	DoF, MoFL, LG, NGOs		
		Sustain and equitably allocate GoB provisions during fishing bans	Med		✓	✓		GoB budget allocations	MoFL, MoDMR, DoF, LG		
		Improve stakeholder participation in national fisheries policy development.	Med	✓	✓	✓		Trust Fund, NGOs	SSF, DoF, NGOs		

		Enhance GoB communications with countries importing shark and ray products	High		✓			GoB budget allocations	MoEFCC, BFD, MoFL, DoF		
		Strengthen GoB engagement in IOTC advocating better regulation of shark and ray fisheries	Med		✓			Donor funds, NGOs	DoF, MoFL		
		Consider signing CMS Sharks MoU	Low			✓		GoB budget allocations	MoEFCC, BFD, MoFL, DoF		
		Engage in ongoing regional/international genetic studies	Low		✓			Research grants	BFRI, Uni, SSF, NGOs		
		Encourage adoption of Environmental Justice Foundation's <i>10 Principals for Global Transparency in Fisheries</i>	Low			✓		Donor funds, NGOs	DoF, MoFL, SSF, NGOs		

Appendix 4. Summary of mitigation measures and recommendations resulting from Non-Detriment Findings for CITES Appendix II listed sharks and rays of Bangladesh.



Research

- ⇒ Conduct research to avoid and reduce bycatch and post-release mortalities of sharks and rays (with a focus on CITES-listed species) in artisanal and industrial fisheries.
- ⇒ Support ongoing population genetic studies in the Indian Ocean (e.g., provide tissue samples for regional population stock assessments initiated by the IOTC or other regional research projects).
- ⇒ Determine spatial distribution in Bangladesh waters and identify habitats used during critical life history stages (e.g., mating, pupping, nursery grounds).
- ⇒ Conduct socio-economic studies on shark fisheries, trade, value, and alternative livelihoods.
- ⇒ Investigate key biological and ecological parameters, life-history, behavioural traits, and discard survival.
- ⇒ Determine whether different deployment depths of gillnets or longlines impact bycatch rates.
- ⇒ Test suitable alternatives to gaffing and/or spearing for improving post-release survival of sharks and rays.
- ⇒ Utilise existing national capacity (e.g., at universities) to improve the identification of products that cannot be visually identified (e.g., oil or meat of certain shark or ray species) through genetic tools.



Awareness and Training

- ⇒ Train fishers on best handling and release practices for protected species, particularly undersized and/or gravid specimens, to reduce bycatch mortalities and protect breeding females. This is of particular importance for rhino rays with high chance of survival following live release. In the case of mobulid rays, document (any) discards with condition on release in accordance with IOTC Res. 19/03.
- ⇒ Motivate fishers to record and report data from bycaught specimens, including location, gear type, size, sex, and maturity of catches.
- ⇒ Encourage the use of iron (or other corrosive) hooks, circle hooks (over j-hooks), and discourage the introduction of wire-leaders on long-lines, to cause less harm to sharks and rays.
- ⇒ Sensitise local administrative officers and the executive and judicial magistrates on wildlife crimes and the associated penalties to ensure that illegal wildlife trade is recognized and prosecuted as a serious crime.
- ⇒ Improve the skills of fishers, traders, other members of marine fishery stakeholder associations, government officers, and individuals through observer and landing survey programmes to identify legally protected sharks and rays and enhance compliance with wildlife protection and trade laws.
- ⇒ Raise awareness about species protection and trade laws (including CITES) among shipping and courier service providers, domestic traders and consumers, exporters and importers, and fishery stakeholders through the provision of posters or billboards featuring identifying characteristics of Schedule I and II listed species, interactive educational outreach events, and tailored communication materials, at major landing, processing, and market/trading sites, as well as exit/entry points.

- ⇒ Request training support from NGOs and international bodies (e.g., Interpol, CITES, World Customs Organisation) to identify how and where shark and ray products are being exported, effective means of exchanging intelligence and combating illegal wildlife trade.



Policy and Governance

National

- ⇒ Strengthen enforcement of existing fishery management regulations, including gear specifications, operating depth, and marine protected area rules, through systematic inter-agency patrols where patrol records are used to plan next patrols (i.e., SMART enforcement patrols). Joint patrolling will additionally improve IUU compliance.
- ⇒ Address shortcomings in the Wildlife (Conservation and Security) Act, 2012, including definitions of Schedule I and II and consequences of violations. Ensure that punishments deter illegal wildlife trade and target the appropriate violator.
- ⇒ Mandate enforcement authorities, including the Department of Fisheries, Coast Guard, Navy, and River Police, with implementing the Wildlife Act Schedule I and II regulations for marine wildlife by harmonising Fisheries Rules with the Wildlife Act for ensuring effective conservation of threatened marine species, including sharks and rays, and their habitats.
- ⇒ Introduce precautionary regulations to prohibit shark finning.
- ⇒ MoEFCC could request the committee of the Biodiversity Act (2017) to highlight and prioritise shark and ray conservation and management at a national level.
- ⇒ DoF to require all exporters and importers of shark and ray products to register and declare their exports/imports at a species level. For nationally protected and/or CITES listed species, appropriate permits issued by BFD must be provided by the trader and verified by DoF before export certificate/permission is issued.
- ⇒ BFD to request Bangladesh Customs to introduce and mandate species-specific HS codes for all shark and ray products, with separate codes for fins, skins, meat, and cartilage, to improve traceability and reporting of exports/imports
- ⇒ DoF, BFD, and Customs to develop a risk index for exporters/importers to support screening upon receipt of export/import permit requests, including black-listing and fining enterprises with multiple violations.
- ⇒ Look into establishing an informal communication group (e.g., on WhatsApp, imo) consisting of local and international shark identification experts to assist with identifying sharks and/or shark products from a camera photo at short notice.
- ⇒ Incorporate additional critical habitats for many shark and ray species by expanding the Swatch-of-No-Ground Marine Protected Area (MPA) and establish MPA monitoring patrols jointly with DoF, BFD, Coast Guard, and Navy.
- ⇒ Improve participatory management through active stakeholder involvement in the development, implementation, and evaluation of national policies, conservation management or action plans.
- ⇒ Encourage the adoption of EJP's 10 principles for global transparency in fisheries (<https://ejfoundation.org/news-media/ejfs-ten-principles-for-global-transparency-in-the-fishing-industry-launched>)

Regional & International

- ⇒ Strengthen engagement of Bangladesh at the IOTC to advocate for better regulation of shark and ray fisheries by all IOTC members. This includes prohibiting the use of FADs in the Indian Ocean, requesting all IOTC members to publish and share their CITES NDFs for pelagic sharks and rays falling under the IOTC Area of Competence, and encouraging the development of regional NDFs to better address conservation concerns of shared stocks.
- ⇒ Establish communications with the CMS Sharks MoU, a non-binding convention that provides recommendations on improving shark and ray management and could be a valuable source of knowledge and capacity building, to identify opportunities to become a Signatory and obtain clarifications on potential obligations.



Monitoring and Reporting

- ⇒ Improve species-specific monitoring and information gathering in national data collection initiatives, including through observers at landing sites and on industrial trawl vessels, and standardized data collection protocols, including information on catch location and gear type, size, sex, and maturity of catches, documenting discards and the condition at release, particularly from priority species (e.g., CITES, CMS, IOTC listed-species, other shark and ray species of national importance).
- ⇒ Consolidate and optimize existing data collection and reporting procedures, protocols, and forms (e.g., procedures and reporting formats used by Marine Fisheries Survey Management Unit, Fisheries Resources Survey System, and the Bangladesh Fisheries Development Corporation) to provide species-specific details, together with officers/stakeholders with practical, in-field experience. Standard operating procedures developed by the BFD/SUFAL with technical support from WCS could be adapted.
- ⇒ Evaluate opportunities for crew-based observer schemes in artisanal fishing fleets, including provision of a GPS as navigation aid in exchange for obtaining shark and ray catch location data, and onboard observers or electronic monitoring systems (EMS) for industrial fleets.
- ⇒ Harmonize data, in particular bycatch information, from different sources (e.g., data reported in national statistics or to the IOTC, FAO, and CITES). This includes revising current data collection procedures and protocols.
- ⇒ Utilize community science (e.g., trained citizen scientists from fisher communities) for monitoring the impacts/effectiveness of fisheries management regulations.
- ⇒ BFD and DoF to identify opportunities with Bangladesh Customs to designate a limited number of ports of exit/entry for shark, ray, and other wildlife products to enable better monitoring of exports/imports while reducing the need to enhance detection and identification capacity at all exit/entry points across the country.
- ⇒ DoF to identify and make necessary changes to the current quality inspection process for fishery export products to ensure compliance with national wildlife protection and international wildlife trade regulations.
- ⇒ DoF Fish Inspection and Quality Control (FIQC) unit should prepare a methodology for random sampling export shipments for shark and ray products in collaboration with Customs and BFD. Training support can be requested from NGOs and international bodies (e.g., Interpol, CITES, World Customs Organisation, SAWEN) to identify how and where shark and ray products are being exported and combat illegal wildlife trade.
- ⇒ Ensure that all wildlife crime cases are shared with the BFD Wildlife Crime Control Unit (WCCU) to facilitate reporting to regional bodies (e.g., CITES, SAWEN).
- ⇒ BFD to consider electronic CITES permission system with support from CITES Secretariat to facilitate sharing of CITES permit data with DoF and Customs.

Appendix 5. Overview of communications between WCS and government officers under the SUFAL shark and ray assignment (January 2021 – July 2022) aimed to strengthen interagency coordination and collaborations.

Date	Officer name, designation, agency	Communications
4 February 2021	BFD SUFAL PD/PMU, CF Wildlife	Submission of Inception Report.
16 February 2021	DoF Deputy Chief (Marine)	Briefing on consultancy assignment objectives and activities results in commitment from DoF to strengthen collaboration with BFD and support activities.
	Dr. Tanvir Hossain Chowdhury	
	DoF DG Quazi Shams Afroz	Request for opportunity to brief DG and senior DoF officers on consultancy assignment objectives and activities sent.
23 February 2021	DoF DG Quazi Shams Afroz	Information on workshops sent along with request for permission to correspond directly with senior DoF officers.
22 March 2021	BFDC Chairman Kazi Hasan Ahmed	Briefing on consultancy assignment objectives and activities results in commitment from BFDC to cooperate with BFD.
25 March 2021	DoF Deputy Chief (Marine)	Briefing on SUFAL shark and ray consultancy assignment objectives and activities results in commitment from key senior DoF officers to strengthen coordination, cooperation, and collaborations with BFD and support activities of SUFAL shark and ray consultancy assignment.
	Dr. Tanvir Hossain Chowdhury; Assistant Director (Marine) Shoukot Kabir Chowdhury; PD Sustainable Coastal and Marine Fisheries Project, Kh. M. Haque	
3 April 2021	DoF Director (Marine) Dr. Sharif Uddin	Briefing on consultancy assignment objectives and activities results in assurance of full cooperation from DoF MFO.
5 April 2021	BFRI Senior Scientific Officer	Briefing on SUFAL shark and ray consultancy assignment objectives and activities resulting in assurance of BFRI cooperation and collaboration with BFD/WCS.
	Dr. Ehsanul Karim and Former Director Dr. Enamul Haque	
6 April 2021	BFRI DG Dr. Yahia Mahmud	Briefing on consultancy assignment objectives and activities resulting in BFRI committing to collaborate with BFD and support activities of consultancy assignment.
	1 st meeting of National NPOA Working Group appointed by MoFL with MoFL Deputy Secretary; DoF DG, PSO MFSMU, Deputy Chief (Marine); BFRI, IUCN-BD, WCS, BFD represented by CF Wildlife and SUFAL DPD	WCS and BFD participated as nominated working group members. SUFAL DPD/BFD proposed inclusive development process for NCS/NPOA as per SUFAL plans. Working group members agree to join efforts accordingly.
12 April 2021	DoF Director (Marine) and PSO MFSMU	Discussion on consultation agenda and participants resulting in timely participant and speaker nominations.
19 April 2021	DoF DG, BFRI DG and Former Director;	Invitation, nomination and speaker request with supporting documents for first national consultation workshop sent.
	BFDC Manager of Cox's Bazar Fish Landing Center Md. Ahsanul Haque	
21 April 2021	DoF Assistant Director (Marine)	Briefing on development of NCS/NPOA resulting in strong support for collaborative approach with BFD.
	BFDC Manager of Cox's Bazar	Briefing on trainings and consultations resulting in his acceptance to participate as speaker in consultation workshop.

30 May 2021	BFD SUFAL DPD Modinul Ahsan	Interim progress report provided by WCS as per request.
	BFD SUFAL PMU	Inception report approved and first payment installment received.
12 July 2021	BFD SUFAL PD, PMU, CF Wildlife	Submission of 1 st Progress Report along with deliverables by WCS.
27 July 2021	BFD SUFAL DPD Modinul Ahsan	Presentation on 1 st Progress Report delivered by WCS as per request.
17 August 2021	BFD SUFAL PD and PMU	Request for PMU observations on 1 st Progress Report by WCS.
19 August 2021	DoF Director (Marine)	Progress made to date and upcoming activities discussed in informal virtual meeting.
24 August 2021	BFD SUFAL DPD Modinul Ahsan	Observations from PMU on 1 st Progress Report and deliverables discussed, changes made accordingly by WCS.
31 August 2021	DoF DG, BFRI DG, BFDC Chairman, Customs Commissioners for Chattogram and Khulna	Nomination requests sent for technical training workshops on CITES shark and ray identification and monitoring.
6 September 2021	BFD DCF, Education and Training Wing, Md. Oli UI Haque	Follow-up on nomination of BFD participants for technical training workshops on CITES shark and ray identification and monitoring.
9 September 2021	BFD SUFAL PD, DPD, PMU	Meeting on progress with conservation strategy development and revised schedule for NDF development trainings.
10 September 2021	BFD SUFAL PD, DPD, PMU, WorldBank Officials	Introductory presentation for WorldBank mission on SUFAL shark and ray consultancy assignment and update on activities and results to date delivered by WCS as per request.
12 September 2021	2 nd meeting of National NPoA Working Group appointed by MoFL with MoFL Deputy Secretary; DoF DG, PSO MFSMU, Deputy Chief (Marine); BFRI, IUCN-BD, WCS, BFD represented by CF Wildlife and SUFAL DPD	BFD SUFAL DPD updated members on activities and the proposed NCS/NPOA development process under the SUFAL shark and ray consultancy assignment. BFD and WCS provided extensive comments on draft matrix with proposed actions for improving shark and ray conservation management presented by DoF. Working Group agreed to follow SUFAL process and thereby avoid two similar documents being prepared by two agencies/ministries.
12/13 September 2021	BFD DCF Md. Oli UI Haque; DFO (Wildlife) Khulna Nirmal Paul; DFO (Wildlife) Chattogram Rafiqul Islam	Nominations of participants for technical training workshops on CITES shark and ray identification and monitoring (field- and mid-level officers) requested.
19/22/23 September 2021	BFD SUFAL PD, DPD, PMU, Procurement Specialist	Inquiry by WCS about delayed second payment installment and comments from PMU on First Progress Report submitted in July to avoid potentially hampering/delaying project activities.
25 September '21	BFD SUFAL PD, CF Wildlife	PD advises WCS to request endorsement of First Progress Report from CF Wildlife Dr. Mollah Rezaul Karim.
28 September 2021	DoF DG Kh. Mahbubul Haque	Published gazette notification amending shark and ray listing under the Wildlife (Conservation and Security) Act, 2012 sent by WCS along with a congratulatory note to the newly appointed DoF DG.
	BFD SUFAL PD	PD requested by WCS to officially communicate the SUFAL/WCS ToR with the CF Wildlife to clarify the need for his endorsement of submitted reports/deliverables to enable payments to be issued in a timely manner.
29 September 2021	BFD CCF Md. Amir Hosain Chowdhury; SUFAL PD; and DCF Md. Oli UI Haque	Follow-up request for payment and nominations of BFD participants for trainings by WCS.
3 October 2021	BFRI DG Dr. Khalilur Rahman	Briefing of newly appointed DG BFRI on SUFAL shark and ray consultancy assignment objectives and activities, request for nominations of participants for technical training workshops.

	BFD DFO Sundarbans East Md. Belayet Hossain; DFO Cox's Bazar Md. Anowar Hossain Sarkar; DFO (Wildlife) Khulna Nirmal Kumar Paul	Nominations received of BFD field- and mid-level officers for technical training workshops on CITES shark and ray identification and monitoring to strengthen CITES compliance and combat illegal trade in sharks, rays, or their parts.
6 October 2021	MoEFCC Secretary, representatives from MoEFCC, BFD, DoF, DoE, Parjatan Corporation, MoS, WCS	WCS attends interministerial meeting called by MoEFCC to discuss the proposal for establishing a Saint Martin's MPA prepared by WCS on request from the BFD.
	BFD SUFAL	Second installment payment against First Progress Report submitted by in July 2021 received from BFD/SUFAL.
8 October 2021	BFD WCCU Director Jahir Uddin Akon	Discussion on trainings, consultations, and research activities resulting in support and attendance from WCCU.
9 October 2021	BFD SUFAL PD	WCCU Director nominated by SUFAL PD as official representative for technical trainings and consultations.
10 October 2021	DoF DG Kh. Mahbubul Haque; BFRI CSO; BFDC Chairman Kazi Hasan Ahmed	Follow-up calls on trainee nominations for technical training workshops on shark and ray identification and monitoring.
	BFD CF Wildlife	CF Wildlife requested to keep DFOs informed about SUFAL shark and ray activities and to visit training workshops.
10-17 October 2021	BFD CF Wildlife; WCCU Director; Sheikh Kamal Wildlife Center Director Imran Ahmed; DoF Deputy Chief (Marine); DoF Assistant Director (Training); BFRI DG; BFDC Chairman	Follow-up calls on trainee nominations for technical training workshops on shark and ray identification and monitoring, requesting new nominations to replace DoF participants unable to join during fishing ban period.
24 -25/27-28 October 2021	BFD, DoF, MFO/MFSMU, BFRI, BFDC, Customs, WCS Citizen Science Network members, WCS facilitators	WCS conducted two intensive two-day long technical training workshops with a total of 49 government officers and guests, and citizen scientists on CITES shark and ray identification and monitoring in Chattogram.
26 October 2021	DoF Director (Marine), MFO and MFSMU officers	Presentation on SUFAL shark and ray consultancy assignment objectives and activities during visit to MFO/MFSMU offices in Chattogram.
	DoF Fish Inspection and Quality Control Officer Aminul Islam	WCS confirmed species identification and protection status (Bengal whiprays, NL) of frozen rays presented for export by a trader in Chattogram on request from DoF based on photographs.
27 October 2021	BFD SUFAL PD	WCS attended meeting with all NGOs contracted under SUFAL for sharing information with and engaging BFD.
31 October-3 November 2021	BFD, DoF, MFO/MFSMU, BFRI, BFDC, Customs, WCS Citizen Science Network members, WCS facilitators	WCS conducted two intensive two-day long technical training workshops with a total of 46 government officers and guests, and citizen scientists on CITES shark and ray identification and monitoring in Khulna.
6 November 2021	Fishers, fishing vessel captains, and shark and ray traders from <i>Majhi Shomiti</i> in Alipur, Kuakata	WCS facilitated day-long consultation with 30 shark and ray fishery and trade stakeholders to share knowledge on the status and threats to sharks and rays in Bangladesh and discuss proposed governance and conservation interventions.
12 November 2021	BFD Forester (Bhola) S M Zahidul Islam	Reported landing of several ray species, including large specimen likely of a giant freshwater whipray, to WCS, but no photographs provided to verify species identification.

	MoEFCC Minister, Deputy Minister, Secretary, officials from MoF, NBR, MoFL, DoF, BFD, Coast Guard, Navy, BGB, Customs.	WCS with the collaboration of Bangladesh Forest Department arranged a seminar on In consultation meeting for strengthening law enforcement in combating illegal wildlife trade with high-level officials from relevant government agencies, arranged by WCS in collaboration with BFD, SUFAL shark and ray objectives and activities were highlighted.
2 December 2021	DoF Director (Marine) Dr. Sharif Uddin	Discussion about improving the monitoring and reporting of shark and ray landings from industrial fisheries, nomination requests for upcoming workshops and trainings.
5 December 2021	3 rd NPOA Working Group meeting with MoFL Deputy Secretary; DoF DG, PSO MFSMU, Deputy Chief (Marine); BFRI, IUCN-BD, WCS, BFD CF Wildlife Dr. Mollah Rezaul Karim and SUFAL DPD Md. Abdullah Abraham Hossain	Revised draft matrix on proposed shark and ray fisheries management interventions presented by DoF for working group members to comment on. BFD SUFAL DPD provided an update on progress with the NCS/NPOA development under the SUFAL shark and ray consultancy assignment.
	BFD DCCF Jahidul Kabir	Information on existing fish sanctuaries, MPAs and the proposed Blue Belt OECM for inclusion in a presentation for an international OECM webinar prepared in slides by WCS as per request from BFD DCCF.
	BFD CCF, SUFAL PD	Discussion on selection of participants for CITES NDF development workshops, waiver on SRF entry permit for WCS researchers/SUFAL survey work, and regarding the declaration by MoEFCC of the Saint Martin's MPA based on a proposal developed by WCS on request from the BFD.
8 December 2021	BFD SUFAL PD	Meeting with SUFAL PD Mr. Gobinda Roy to respond to comments from the PMU on documents prepared under the SUFAL shark and ray consultancy assignment and submitted to the BFD/SUFAL by WCS.
14 December 2021	BFD CF (Wildlife) Khulna, DFO Sundarbans East	Meeting to discuss boat- and land-based investigations under SFUAL shark and ray consultancy assignment and permit fees for WCS researchers, survey vessels, and crew.
15 December 2021	DoF Fish Inspection and Quality Control officer (Chattogram) Aminul Islam	Identity and protection status for shipment of Bengal whiprays confirmed and additional communication tools provided by WCS on request.
19 Dec 2021	BFD CCF	NDF validation workshop with international NDF expert Daniel Fernando confirmed for 17 February 2022.
21 December 2021	BFD SUFAL PD, DPD, CF Wildlife	Agenda and venues for NDF development workshops to be held in February finalized.
22 December 2021	BFD CF Wildlife	Discussed selection criteria for suitable BFD candidates for NDF development workshops.
24, 26 Dec 2021	DoE Director of Planning Mohammed Solaiman Haider	Information on Saint Martin's Island ECA requested by WCS for BFD to inform MoEFCC declaration of the new MPA encompassing priority habitat for sharks and rays, including pelagic species.
1 January 2022	BFDC Pathorghata Manager Lieutenant	Verification of identification for strictly protected Sharpnose guitarfish from pictures received via WhatsApp.
3 January 2022	M. Lutfor Rahman	Verification of Whitenose whiprays listed on Wildlife Act Schedule II from pictures received via WhatsApp.
3/4/8 January 2022	BFD SUFAL PD; DCCF Moyeenuddin Khan, CF Wildlife (Dhaka)	Follow-up on BFD nominations for NDF development and validation workshops. WCS offers to arrange visit to SoNG MPA for BFD officials. Dates cannot be shifted due to survey completion/end of rental agreement for survey vessel.
12 January 2022	BFD SUFAL PD, PMU	Submission of 2 nd Progress Report and deliverables to SUFAL PD and PMU by WCS.

13 January 2022	BFD Sheikh Kamal Wildlife Center Director Imran Ahmed; SUFAL DPD Md. Abdullah Abraham Hossain	Confirmation of receipt of reports prepared and submitted by WCS under the SUFAL shark and ray consultancy assignment, and participation of Wildlife Center representative in NDF development workshop.
16 January 2022	BFDC Pathorghata Manager	Verification of strictly protected (Schedule I) Giant freshwater whiplay from pictures received via WhatsApp.
	BFD CF Wildlife Dr. Mollah R. Karim	Request for endorsement of WCS report and deliverables as per ToR of the SUFAL consultancy assignment.
18 January 2022	BFD SUFAL DPD	Request from WCS to SUFAL DPD for assistance in obtaining endorsement of submitted reports from CF Wildlife.
25/26 January 2022	BFD DCCF Moyeenuddin Khan, CF Wildlife Dr. Mollah R. Karim	WCS requested an official request from the BFD to the DoF for support in communicating and enforcing the amended listing of sharks and rays in Wildlife (Conservation and Security) Act, 2012, with a copy of the gazette notification.
1/2 February 2022	BFD CCF, SUFAL PD, DPD, and ACCF Dr. Mariam Akhter	Confirmation of NDF validation workshop venue and arrangements in the BFD Ban Bhaban auditorium.
8-10/13-15 Feb 2022	BFD, DoF/MFSMU, BFRI, academia	Two intensive 3-day long workshops arranged by WCS in Chattogram and Dhaka resulting in four CITES NDFs developed by 22 national experts from BFD, DoF, and national universities facilitated by international expert.
9/10 February 2022	BFD CCF, SUFAL PD and DPD, CF Wildlife (Dhaka), Dr Marium ACCF DP	Finalized NDF validation workshop agenda, participants, invitation letters. CCF agreed to invite DG as Guest of Honor.
11 February 2022	DoF inspectors, Chattogram	WCS accompanied DoF inspectors to industrial trawl vessels and cold storage in Chattogram port to gain a better understanding of industrial fishery catches and landings of sharks and rays.
14 February 2022	BFD CCF, SUFAL PD and PMU members	Adjustments made to NDF validation workshop agenda and participants list, posters and brochure on protected sharks and rays of Bangladesh approved for printing, PMU members visit NDF workshop in Banani, Dhaka.
14 February 2022	BFD WCCU Inspector Ashim Mollick	Verified identification of protected species from dried parts from pictures shared via WhatsApp. WCS confirmed fins from strictly protected pigeye, bull, and hammerhead sharks, and skins from strictly protected Bleeker's whiplays and guitarfishes. WCCU seized 160 kg shark and ray products and warned trader.
14 February 2022	DoF Chattogram Inspector Aminul Islam	Verified identification of protected species and their parts from online trader Facebook page. WCS confirmed fins from strictly protected whale shark and sawfish. DoF issued warning to trader for offence.
16 Feb 2022	BFD CCF, SUFAL PD	Finalized the meeting date of Scientific Committee to endorse NDFs for submission to CITES Secretariat (24/02).
17 Feb 2022	BFD, DoF, BFRI, Customs, Research Institutes, Universities, NGOs	WCS facilitated and presented NDFs for validation in workshop held at BFD headquarters in Dhaka with 30 key officers and national experts from government and non-government institutions and international expert.
28 Feb 2022	BFD Scientific Committee	WCS presented NDFs and responded to questions from Scientific Committee members, including representatives from MoEFCC, BFD, IUCN-BD, National Zoo Dhaka, Department of Zoology from Dhaka and Jahangirnagar Universities. NDFs endorsed for submission to CITES Secretariat.
2 March 2022	BFD SUFAL	Third installment payment against Second Progress Report received from BFD/SUFAL.
3 March 2022	BFD SUFAL DPD	Additional interim progress report with pictures provided by WCS as per request from SUFAL DPD.
	BFD and MoEFCC officials, public	WCS Country Representative Dr. Zahangir Alom delivered speech on efforts and achievements in wildlife protection at World Wildlife Day celebration at the BFD headquarters in Dhaka. WCS arranges stall as per BFD request.
8 March 2022	BFD WCCU Inspector Abdullah As Sadik	Verified identification of WA II listed Honeycomb whiplay from pictures received via WhatsApp, leading to seizure of four specimens (total weight 157.50 kg) and case filed against two offenders by the WCCU.

13 March 2022	BFD CCF, CF Wildlife (Dhaka), WCCU Director, SUFAL PD	Discussed next steps for submission of NDFs to CITES Secretariat and request for mass communication materials developed under SUFAL shark and ray consultancy assignment to be circulated.
15 March 2022	BFD SUFAL PD	WCS assistance requested with preparing a report of BFD contributions to the blue economy as per MPEMR directives.
17 March 2022	BFD Range officer (Pathorghata) Md. Monirul Haque	WCS informed him that the seizure reported in national media was of non-protected shark species and requested that species identification and protection status be carefully verified before taking such action in future.
18 March 2022	BFD Cox's Bazar ACF, Biodiv. Officer	WCS sent additional copies of mass communication tools as per request from Anisul Islam and Israt Jahan.
19 March 2022	BFDC Cox's Bazar Landing Site Manager Ehsanul Haque	WCS sent copy of official gazette notification of amended shark and ray listing under the Wildlife Act for public display at the fish landing site after receiving information about a misinformed notice having been displayed.
20/21/24/29 March 2022	BFD SUFAL PD, DPD, CCF	Follow-up on approval for printing posters and leaflets, submission of NDFs to CITES Secretariat, CITES CoP19 updates.
28 March 2022	BFD WCCU Inspector Ashim Mollick	Request for additional copies of educational outreach materials accommodated.
28 March 2022	BFD CCF, DCCFs Dr. Zaglul Hossain, Moyeenuddin Khan, and Abdullah Abraham Hossain, CF Wildlife (Dhaka), CF Khulna Mihir Kumar Doe, CF Barisal Mohammad Harun Ur Rashid Khan, WCCU Director, ACCF Dr. M. Akhter	WCS presented draft Integrated Management Plan for the SoNG MPA, including a proposed expansion to incorporate priority shark and ray habitats, and responded to questions from BFD. Next steps (additional consultations and adapting proposed changes) for finalizing the IMP-SoNG MPA through additional consultations and a national committee were agreed on.
5 April 2022	BFD SUFAL PD and DPD	Follow-up on approval for printing posters and leaflets and nominating BFD representative for NPOA Working Group.
6 April 2022	4 th NPOA Working Group meeting with MoFL Deputy Secretary; DoF DG, PSO MFSMU, Deputy Chief (Marine); BFRI, IUCN-BD, WCS, BFD CF Wildlife and SUFAL DPD	Member representatives from the MoFL, DoF, BFD, BFDC, BFRI, and WCS came to unanimous decision to pursue one document (NCS/NPOA-Sharks & Rays) to be finalized for review and approval by the NPOA Working Group for government endorsement. Two BFD representatives (SUFAL DPD, CF Wildlife (Dhaka)), 2 DoF officers, and WCS were designated as a sub-group to carefully review the document and finalize it for comments and approval from the NPOA Working Group.
12 April	BFD PD SUFAL	Mr. Gobinda Roy directs BFD officers to supporting traveling exhibition and cooperating with WCS.
16-19 April 2022	BFD, DoF/FIQC, Police, BFDC, DC offices in Khulna	Invitation extended to visit 'Ocean Guardians – Protected Sharks and Rays of Bangladesh' exhibition at Rupsha Ghat in Khulna and educational outreach materials provided during office visits and/or calls to BFD CF Mihir Kumar Doe, Sundarbans West Forest Division DFO Abu Naser Mohsin Hossain, DFO Sundarbans East Md Belayet Hossain, DFO Wildlife and Nature Conservation Division Nirmal Kumar Paul, CF Wildlife Dr. Mollah Rezaul Karim, WCCU Director Jahir Uddin Akon; DoF Office of the Deputy Director Khulna Assistant Director Raj Kumar Biswas, Senior Upazila Fisheries Officer Bapi Kumar Das, and FIQC Inspector Pranab Kumar Das; Khulna Sadar Police Station OC Aslam Bahar Bulbul, BFDC Fish Landing and Wholesale Fish Market Manager Md. Rasel Shikdar; DC Office Khulna Deputy Commissioner & District Magistrate Md Moniruzzaman Talukder, Assistant Commissioner & Executive Magistrate Sharmin Jahan Luna.
17-18, 21, 24, 27-28 April 2022	Government officers, fisherfolk, fish processors and traders, fishing vessel owners, conservation groups, students.	<i>Ocean Guardians- Protected Sharks and Rays of Bangladesh</i> Exhibition held at fish landing or market sites in Khulna, Bagerhat, Barguna, and Alipur with a total of 2,144 visitors.

20 April 2022	BFD, DoF, DC offices in Bagerhat	Invitation extended to visit 'Ocean Guardians – Protected Sharks and Rays of Bangladesh' exhibition at KB Ghat in Bagerhat and educational outreach materials provided during office visits and/or calls to BFD Sundarbans East Forest Division DFO Md. Belayet Hossain; Upazila Fisheries Office Bagerhat Senior Upazila Fisheries Officer Md. Ferdous Ansaree; DC Office Deputy Commissioner & District Magistrate Muhammad Azizur Rahman.
24 April 2022	DoF Deputy Chief (Marine) and Assistant Director (Marine)	Line-by-line review of priority actions in draft NCS/NPOA by Dr. Tanvir Hossain Chowdhury and Shoukot Kabir Chowdhury discussed with WCS and suggested edits incorporated.
24 April 2022	BFD, DoF, BFDC offices in Pathorghata, Borguna	Invitation extended to visit 'Ocean Guardians – Protected Sharks and Rays of Bangladesh' exhibition at BFDC Fish Landing and Wholesale Fish Market in Pathorghata and educational outreach materials provided during office visits and/or calls to BFD Pathorghata Forest Office Range Officer Md. Monirul Haque; DoF Upazila Fisheries Office Pathorghata Senior Upazila Fisheries Officer Joyanta kumar Apu; BFDC Fish Landing and Wholesale Fish Market Pathorghata Manager Lieutenant Md. Lutfor Rahman.
26 April 2022	BFD, DoF, BFDC, UNO officers in Alipur, Kuakata	Invitation extended to visit 'Ocean Guardians – Protected Sharks and Rays of Bangladesh' exhibition at BFDC Fish Landing and Wholesale Fish Market in Alipur/Kuakata, and educational outreach materials provided during office visits and/or calls to DoF Upazila Fisheries Office Koalpara/Patuakhali Senior Upazila Fisheries Officer Apu Saha, BFDC Fish Landing and Wholesale Fish Market Alipur/Kuakata Manager Md. Shakil Ahmmmed, Forest Range Officer Abul Kalam Mohipur, Officer in Charge Mohipur, Upazilla Nirbahi Officer Kolapara Potuakhali.
26 April 2022	BFD SUFAL DPD, CF Wildlife	Line-by-line review of priority actions in draft NCS/NPOA by SUFAL DPD and officers designated by the CF Wildlife, incorporated budget estimates for each activity proposed, and agreed on sending the revised version as per these inputs to the DoF/NPOA Working Group members for comments.
4 May 2022	BFD SUFAL PD Gobinda Roy	Postponement of third national consultation workshop NCS/NPOA with senior GoB officers confirmed.
10-16 May 2022	BFD, DoF, BFDC, DFO, Magistrate, and UNO officers in Chattogram and Cox's Bazar	Invitation extended to visit 'Ocean Guardians – Protected Sharks and Rays of Bangladesh' exhibition at BFDC Fish Landing and Wholesale Fish Market in Cox's Bazar and Modern Fisheries Ghat in Chattogram, and educational outreach materials provided during office visits and/or calls to BFD CF Chattogram Bipul Krishna Das; DoF Director (Marine) Dr. Sharif Uddin, Upazila Fisheries Officer (Kutubdia, Cox's Bazar) Nasim Al Mahmud, Senior Upazila Fisheries Officer (Moheshkhali) Md. Abdur Rahman Khan, District Fisheries Officer (Cox's Bazar) S.M. Khalequzzaman; BFDC Cox's Bazar Fish Landing Center Manager Md. A. Haque; DFO Cox's Bazar Mozammel Hoque Shah Chowdhury and Md. Shofiqul Islam, Deputy Commissioner and District Magistrate Md. Mamunur Rashid, Assistant Commissioner, (Cox's Bazar) Kazi Mahmudur Rahman, and Upazilla Nirbahi Officer Teknaf Parvez Chawdhury.
12/17/18/24 May 2022	BFD CCF, SUFAL PD, DPD	Discussions to finalize date, invitees, and agenda for 3 rd national consultation workshop on NCS/NPOA-Sharks & Rays.
11-12, 15-16 May 2022	Government officers, fisherfolk, fish processors and traders, fishing vessel owners, conservation groups, students	<i>Ocean Guardians- Protected Sharks and Rays of Bangladesh</i> Exhibition held at Fish Landing and Wholesale Fish Market in Cox's Bazar and Modern Fisheries Ghat in Chattogram with a total of 1,983 visitors.
19 May 2022	BFD WCCU Inspector Abdullah As Sadik	WCS responded to request for information on protected shark and ray species.
22 May 2022	BFD SUFAL PD/PMU, DPD, WorldBank	Meeting with WorldBank Implementation Mission, presentation by WCS on progress and achievements to date.

23 May 2022	DoF Deputy Chief (Marine), Assistant Director (Marine)	Additional comments on NCS/NPOA with Dr. Tanvir Hossain Chowdhury and Shoukot Kabir Chowdhury discussed. DoF agrees on sending draft NCS/NPOA for review to all NPOA Working Group members after BFD inputs received. Agenda and proposed speakers for 3 rd national consultation are discussed.
26 May 2022	NPOA Working Group Sub-group: BFD CF Wildlife (Dhaka), SUFAL DPD; DoF Deputy Chief (Marine), Assistant Director (Marine); WCS	Virtual meeting of designated NPOA Working Group subgroup members Dr. Tanvir Hossain Chowdhury, Shoukot Kabir Chowdhury, Dr. Mollah Rezaul Karim, and WCS to address any additional comments, agree on sharing the draft NCS/NPOA for review by the NPOA Working Group and national experts that participated in the 1 st national consultation, and briefly discussed preparations for 3 rd national consultation with senior GoB representatives.
27 May 2022	BFD Chattogram Biodiversity Officer	Verification of Wildlife Act II listed Round whorl from pictures sent by Dipannita Bhattacharjee via WhatsApp.
30/31 May 2022	BFD CCF, SUFAL PD and DPD	CCF Md. Amir Hosain Chowdhury approves venue for 3 rd national consultation on NCS/NPOA-Sharks & Rays, agrees to finalized agenda and participants list, acknowledges WCS' request for submitting the NDFs to CITES Secretariat before the CITES CoP19 in November 2022.
31 May 2022	5 th meeting of National NPOA Working Group with MoFL Secretary, DoF DG, and representatives from BFD, DoF, BFDC, IUCN-BD, WCS, and universities.	All twelve attending members agreed on the collaboratively developed NCS/NPOA-Sharks & Rays being submitted for government endorsement after the third national consultation with senior government ministry and agency representatives.
2 June 2022	BFD CCF, DCCF Md. Zaglul Hossain, CF Wildlife Dr. Mollah Rezaul Karim	Discussion about Panama's proposal to the CITES CoP19 for listing all requiem sharks on CITES Appendix II, results in CCF/Bangladesh CITES MA agreeing to submit a co-sponsor letter in support of the proposal.
5 June 2022	BFD, MoEFCC	WCS attended Inauguration of Tree Fair at Bangabandhu International Convention Center.
6,7,8 June 2022	BFD CCF, SUFAL PD, CF Wildlife	Discussion on inviting MoFL Secretary and DoF DG as special guests to 3 rd national NCS/NPOA consultation through official communications from MoEFCC to MoFL, and further adjustments to consultation participants.
9 June 2022	BFD CCF	Revised letter of co-sponsorship on Panama's proposal to CITES CoP19 signed by CCF and submitted to CITES Secretariat. CCF calls DoF DG Kh. Mahbubul Haque for inviting him as special guest to the 3 rd national consultation.
12/13 June 2022	BFD CCF	CCF Md. Amir Hosain Chowdhury requested to issue invitation letters to participants for 3 rd national consultation and to communicate with MoEFCC for issuing invitations for representatives from relevant ministries, to which he agreed.
16 June 2022	BFD CCF, SUFAL PD	Discussion on changes requested by CCF to changes/title/acknowledgements before circulating NCS/NPOA-Sharks & Rays document to consultation participants.
18 June	BFD CCF, SUFAL PD/PMU, CF Wildlife, and other relevant BFD officers	Preparatory meeting for 3 rd consultation workshop on NCS/NPOA-Sharks & Rays in Ban Bhaban resulting in issues regarding title and circulation of the document being resolved.
19 June 2022	MoEFCC, MoFL, MoC, NBR/Customs, BFD, DoF, BFDC, BFRI, Police	NCS/NPOA and NDFs presented and reviewed for government endorsement in 3 rd National Consultation on National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh and Non-Detrimental Findings (NDFs) held in Hotel Radisson Blu Dhaka with 42 senior government officials, with Honorable Minister MoEFCC, Md. Shahab Uddin M.P, as Chief Guest, MoEFCC Additional Secretary (Admin) Iqbal Abdullah Harun, BFD CCF Md. Amir Hosain Chowdhury, and DoF DG Kh. Mahbubul Haque as Special Guests, and MoEFCC Secretary Dr. Farhina Ahmed as Chair.
12 July 2022	BFD SUFAL PD, PMU, CCF	Submission of 3 rd Progress Report on SUFAL shark and ray consultancy assignment as per ToR with deliverables for which cover pages and citations were revised as per CCF/SUFAL PD directives.

Appendix 6. Contractual deliverables, status, and completed activities and reports.

Transfer of Knowledge (Training/Workshop/Seminar etc.)	Quantity, Tenure (days)	# of participants as per contract	Status and completed activities
Training workshop on shark and ray data collection and monitoring for field-level staff of the Bangladesh Forest Department, Department of Fisheries, Bangladesh Fisheries Development Corporation, data collectors at fish landing sites, and fishing vessel captains.	2 x 2 days	20 trainees x 2 workshops = 40 trainees	95 field- and mid-level officers from BFD, DoF, BFDC, Customs, and data collectors at fish landing sites and fishing vessel captains trained in 4 x 2 day-long workshops in Chattogram and Khulna in October/November 2021.
Details provided in 2 nd Progress Report and <i>Report on technical training workshops on shark and ray data collection and monitoring for field and mid-level government officers.</i>			
Consultation workshops with government stakeholders and fishing vessel captains and traders for sharing knowledge on the status of sharks and rays and their conservation and developing national conservation strategy.	2 x 1 day	20 participants x 2 workshops = 40 total participants	1) 2-day long consultation workshop with 59 national experts and government stakeholders conducted virtually in May 2021. 2) Day-long consultation workshop with 30 fishing vessel captains, fishers, and fish traders held in Alipur in November 2021. 3) Day-long consultation workshop conducted with 40 senior government representatives in Dhaka in July 2022.
Details provided in 1 st , 2 nd , and 3 rd Progress Reports and in (1) <i>Report on national consultation for sharing knowledge on the status of and threats to sharks and rays in Bangladesh and developing a national conservation strategy</i> ; (2) <i>Report on the second consultation workshop with fishers, fishing vessel owners, and traders engaged in shark and ray fisheries, processing, and trade, for sharing knowledge on the status of and threats to sharks and rays for a national conservation strategy.</i>			
Training workshop on developing NDFs for the Bangladesh Forest Department and Department of Fisheries with practical outputs of draft NDFs for priority species.	2 x 3 days	12 trainees x 2 workshops = 24 total trainees	22 participants from BFD, DoF, BFRI, BFDC, academia, and WCS trained in 2 x 3-day long workshops in Chattogram and Dhaka in February 2022.

Details provided in 3rd Progress Report and *Report on the development and validation of Non-Detriment Finding (NDF) assessments for CITES II listed Silky Shark, Smooth Hammerhead Shark, Mobula Rays and Rhino Rays for Bangladesh.*

Validation workshop with international experts including regional (Asian Region) and national experts to finalize NDFs.	1 x 1 day	30 experts x 1 workshop = 30 total participants	31 national experts and 2 regional /international experts from government agencies, universities, NGOs reviewed NDFs in a day-long workshop in Dhaka in February 2022 in Dhaka with 33 participants. Details provided in 3 rd Progress Report.
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Details provided in 3rd Progress Report and *Report on the development and validation of Non-Detriment Finding (NDF) assessments for CITES II listed Silky Shark, Smooth Hammerhead Shark, Mobula Rays and Rhino Rays for Bangladesh.*

Educational outreach programs for raising awareness among fishing communities, fish traders and government agencies.	5 x 2 days	At least 200 participants each = 1,000 total participants	4,127 participants, including fishers, traders, government officers, students, and fishing community members at six programs/locations in April and May 2022. Details provided with 3 rd Progress Report.
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Details provided with 3rd Progress Report and *Report on Ocean Guardians – Protecting Threatened Sharks and Rays in Bangladesh.*

Documents/Reports Submitted	Deliverables	Reporting Time	Submission	Approval (Payment) received
1. Inception Report	- Detailed description and timeline of activities - List and justification of priority species for NDFs	Within 1 month of contract signing	12 February 2021	30 May 2021
2. First Progress Report (including baseline information) - Shark and Ray Assessment Report – Baseline information on the status, threats and governance in Bangladesh. - Report on national consultation for sharing knowledge on the status of and threats to sharks and rays in Bangladesh and developing a national conservation strategy. - Draft National Conservation Strategy	- Consultation workshop for sharing knowledge on the status of sharks and rays and developing a National Conservation Strategy (<i>deferred due to Covid-19 restrictions in agreement with SUFAL PD</i>) - Preliminary results reported on shark and ray research - Draft Conservation Strategy for sharks and rays	6 months	12 July 2021	6 October 2021
3. 2nd Progress Report (including updates on all activities, progress on achieving objectives and expenditures to date) - Report on the second consultation workshop with fishers, fishing vessel owners, and traders engaged in shark and ray fisheries, processing, and trade, for sharing knowledge on the status of and threats to sharks and rays for a national conservation strategy. - Report on technical training workshops on shark and ray data	- Trainings on shark and ray data collection and monitoring (<i>deferred due to Covid-19 restrictions in agreement with SUFAL PD</i>) - Consultation workshop for sharing knowledge on the status of sharks and rays and developing a National Conservation Strategy	12 months	12 January 2022	2 March 2022

collection and monitoring for field and mid-level government officers.				
▪ Draft NCS/NPOA-Sharks & Rays				
4. 3rd Progress Report (including updates on all activities, progress on achieving objectives and expenditures to date) ▪ Non-Detriment Findings (NDF) of Bangladesh for Silky and Smooth hammerhead sharks, Mobulid and Rhino rays ▪ Report on the development and validation of Non-Detriment Finding (NDF) assessments for CITES II listed Silky Shark, Smooth Hammerhead Shark, Mobula Rays and Rhino Rays for Bangladesh. ▪ Report on Ocean Guardians – Protecting Threatened Sharks and Rays in Bangladesh. ▪ NCS/NPOA-Sharks & Rays	▪ NDF development training workshops (<i>deferred due to Covid-19 restrictions in agreement with SUFAL PD</i>)) ▪ Validation workshop NDFs ▪ Mass awareness programs ▪ Support CITES MA with submission of NDFs to CITES Secretariat ▪ Finalized National Conservation Strategy for Sharks and Rays for government endorsement and implementation ▪ All deliverables/documents finalized as per SUFAL PD directives for approval to print.	18 months	12 July 2022	To be approved and payment received
5. Final Report (including final results on all activities and achievements related to project objectives)	▪ Draft Final Report for review by SUFAL PMU ▪ All approved deliverables/documents ▪ Address comments and revise Final Report for completion of SUFAL shark & ray consultancy assignment	Within one month from the ending date of the assignment	Draft Final Report due 12 August (deferred due to delay in receiving SUFAL PMU comments on 3 rd Progress Report/Deliverables) Final Report due 12 November 2022	To be approved and payment received

Appendix 7. List of documents prepared by WCS for the Bangladesh Forest Department under the SUFAL shark and ray consultancy assignment.

Progress Reports



Inception Report: Shark and Ray Associated Species Conservation Strategy Development and Non-Detriment Findings (February 2021). Detailed description and timeline of activities, including list and justification of priority species for NDFs.



First Progress Report: Shark and Ray Associated Species Conservation Strategy Development and Non-Detriment Findings (July 2021). Detailed description of activities and achievements, including baseline information.



Second Progress Report: Shark and Ray Associated Species Conservation Strategy Development and Non-Detriment Findings (January 2022). Detailed description of activities and achievements, including baseline information.



Third Progress Report: Shark and Ray Associated Species Conservation Strategy Development and Non-Detriment Findings (July 2022). Detailed description of activities and achievements, including baseline information.

Technical Reports



Shark and Ray Assessment Report (June 2021). Baseline information on the status, threats and governance in Bangladesh.

Non-Detriment Findings (NDFs)



Non-Detriment Findings (NDF) of Bangladesh for Silky sharks *Carcharhinus falciformis*

Non-Detriment Findings (NDF) of Bangladesh for Smooth hammerhead sharks *Sphyrna zygaena*

Non-Detriment Findings (NDF) of Bangladesh for Mobulid Rays *Mobula* spp.

Non-Detriment Findings (NDF) of Bangladesh for all Rhino Ray species

National Conservation Strategy and reports on its consultative development

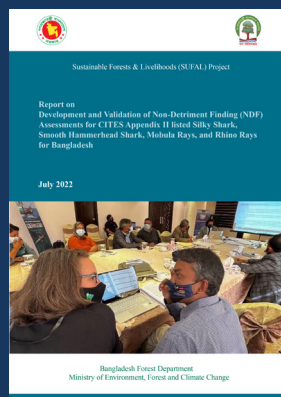
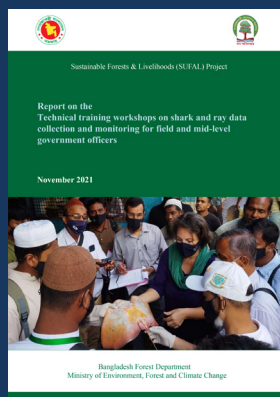


Report on national consultation for sharing knowledge on the status of and threats to sharks and rays in Bangladesh and developing a national conservation strategy (July 2021).

Report on the second consultation workshop with fishers, fishing vessel owners, and traders engaged in shark and ray fisheries, processing, and trade, for sharing knowledge on the status of and threats to sharks and rays for a national conservation strategy (January 2022).

National Conservation Strategy and Plan of Action for Sharks and Rays in Bangladesh 2023-2033 (Draft for Government Endorsement, October 2022).

Reports on Training and Mass Awareness Activities

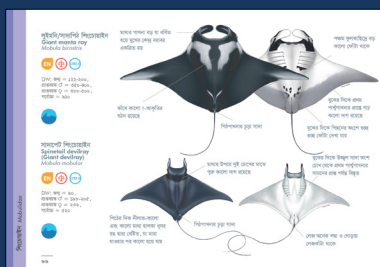
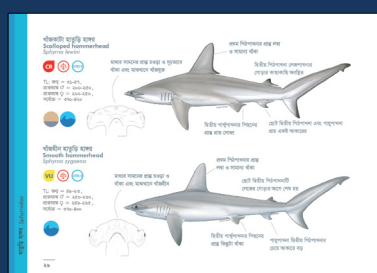


Report on technical training workshops on shark and ray data collection and monitoring for field and mid-level government officers (November 2021).

Report on the Development and Validation of Non-Detriment Finding (NDF) Assessments for CITES II listed Silky Shark, Smooth Hammerhead Shark, Mobula Rays and Rhino Rays for Bangladesh (July 2022).

Report on Ocean Guardians – Protecting Threatened Sharks and Rays in Bangladesh (July 2022).

Training and Communication Materials



Sharks and Rays of Bangladesh – A guide to identifying protected species and their commonly traded parts.



Brochure introducing Protected Sharks and Rays of Bangladesh

Poster on Sharks and Rays protected under the Bangladesh Wildlife (Conservation & Security) Act

Poster on Sharks and Rays of Bangladesh Regulated for International Trade under CITES

Animated short film ‘Ocean Guardians – Protecting Threatened Sharks and Rays in Bangladesh’

